LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

ADMINISTRATIVE RECORD

Volume 12

2023

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LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
ADMINISTRATIVE RECORD – CHRONOLOGICAL INDEX

VOLUME 12

2023

A.	Title:	(Cont'd) Report—Year 8 Annual Remedial Action Operation Report (September 2021–August 2022), LHAAP-35A (58) Shops Area, Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas, March 2023
	Author(s):	Department of the Army
	Recipient:	Environmental Protection Agency and Texas Commission on Environmental Quality
	Date:	March 2, 2023
	Bate Stamp:	01154074 – 01154864
B.	Title:	Report—Draft Final Second Annual Remedial Action Operation Report, LHAAP-16 Landfill, Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas, March 2023
	Author(s):	Department of the Army
	Recipient:	Environmental Protection Agency and Texas Commission on Environmental Quality
	Date:	March 17, 2023
	Bate Stamp:	01154865 – 01156088

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
Sample ID: 35AWW05_120221
Collection Date: 02-Dec-2021 08:55

ANALYTICAL REPORT
WorkOrder:HS21120243
Lab ID:HS21120243-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 15:49
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 15:49
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 15:49
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 15:49
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 15:49
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 15:49
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 15:49
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	15-Dec-2021 15:49
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 15:49
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 15:49
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 15:49
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 15:49
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 15:49
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 15:49
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 15:49
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	15-Dec-2021 15:49
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	15-Dec-2021 15:49
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 15:49
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	15-Dec-2021 15:49
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	15-Dec-2021 15:49
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 15:49
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 15:49
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 15:49
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 15:49
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 15:49
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 15:49
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	15-Dec-2021 15:49
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 15:49
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 15:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
Sample ID: 35AWW05_120221
Collection Date: 02-Dec-2021 08:55

ANALYTICAL REPORT
WorkOrder:HS21120243
Lab ID:HS21120243-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 15:49
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 15:49
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 15:49
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 15:49
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	15-Dec-2021 15:49
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	15-Dec-2021 15:49
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	15-Dec-2021 15:49
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 15:49
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 15:49
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 15:49
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 15:49
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 15:49
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 15:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 15:49
Surr: 1,2-Dichloroethane-d4	*109*			**0**	*81-118*	*%REC*	*1*	*15-Dec-2021 15:49*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*15-Dec-2021 15:49*
Surr: Dibromofluoromethane	*102*			**0**	*80-119*	*%REC*	*1*	*15-Dec-2021 15:49*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*15-Dec-2021 15:49*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
Sample ID: 35AWW15_120221
Collection Date: 02-Dec-2021 09:35

ANALYTICAL REPORT
WorkOrder:HS21120243
Lab ID:HS21120243-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:17
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 20:17
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:17
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:17
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 20:17
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 20:17
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 20:17
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	15-Dec-2021 20:17
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:17
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 20:17
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:17
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 20:17
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 20:17
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 20:17
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:17
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	15-Dec-2021 20:17
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	15-Dec-2021 20:17
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 20:17
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	15-Dec-2021 20:17
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	15-Dec-2021 20:17
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:17
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 20:17
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:17
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:17
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 20:17
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 20:17
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	15-Dec-2021 20:17
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 20:17
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
Sample ID: 35AWW15_120221
Collection Date: 02-Dec-2021 09:35

ANALYTICAL REPORT
WorkOrder:HS21120243
Lab ID:HS21120243-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:17
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:17
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:17
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:17
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	15-Dec-2021 20:17
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	15-Dec-2021 20:17
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	15-Dec-2021 20:17
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 20:17
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:17
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:17
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:17
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:17
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:17
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:17
Surr: 1,2-Dichloroethane-d4	*111*			**0**	*81-118*	*%REC*	*1*	*15-Dec-2021 20:17*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*15-Dec-2021 20:17*
Surr: Dibromofluoromethane	*101*			**0**	*80-119*	*%REC*	*1*	*15-Dec-2021 20:17*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*15-Dec-2021 20:17*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
Sample ID: LHSMW06_120221
Collection Date: 02-Dec-2021 10:20

ANALYTICAL REPORT
WorkOrder:HS21120243
Lab ID:HS21120243-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:40
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:40
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 20:40
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:40
1,1-Dichloroethane	**8.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Dec-2021 20:40
1,1-Dichloroethene	**12**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Dec-2021 20:40
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:40
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 20:40
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 20:40
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 20:40
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:40
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	15-Dec-2021 20:40
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:40
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 20:40
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:40
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 20:40
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:40
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 20:40
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:40
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 20:40
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:40
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	15-Dec-2021 20:40
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:40
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	15-Dec-2021 20:40
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 20:40
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:40
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	15-Dec-2021 20:40
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	15-Dec-2021 20:40
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:40
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 20:40
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:40
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:40
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 20:40
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 20:40
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	15-Dec-2021 20:40
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 20:40
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:40
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:40
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
Sample ID: LHSMW06_120221
Collection Date: 02-Dec-2021 10:20

ANALYTICAL REPORT
WorkOrder:HS21120243
Lab ID:HS21120243-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:40
cis-1,2-Dichloroethene	**140**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Dec-2021 20:40
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:40
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:40
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:40
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:40
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:40
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	15-Dec-2021 20:40
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:40
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	15-Dec-2021 20:40
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	15-Dec-2021 20:40
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 20:40
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:40
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:40
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:40
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:40
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:40
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:40
Tetrachloroethene	**3.0**		**0.30**	**1.0**	**1.0**	**ug/L**	1	15-Dec-2021 20:40
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:40
trans-1,2-Dichloroethene	**1.9**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Dec-2021 20:40
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 20:40
Trichloroethene	**21**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Dec-2021 20:40
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 20:40
Vinyl chloride	**4.2**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Dec-2021 20:40
Surr: 1,2-Dichloroethane-d4	*109*			**0**	*81-118*	*%REC*	*1*	*15-Dec-2021 20:40*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*15-Dec-2021 20:40*
Surr: Dibromofluoromethane	*99.9*			**0**	*80-119*	*%REC*	*1*	*15-Dec-2021 20:40*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*15-Dec-2021 20:40*
METALS BY ICPMS BY SW6020A		**Method:SW6020A**				Prep:SW3010A / 15-Dec-2021		Analyst: JHD
Arsenic	**0.000406**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	15-Dec-2021 22:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
Sample ID: LHSMW06_120221_a
Collection Date: 02-Dec-2021 10:20

ANALYTICAL REPORT
WorkOrder:HS21120243
Lab ID:HS21120243-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 21:02
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 21:02
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 21:02
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 21:02
1,1-Dichloroethane	**8.4**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Dec-2021 21:02
1,1-Dichloroethene	**12**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Dec-2021 21:02
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 21:02
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 21:02
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 21:02
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 21:02
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 21:02
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	15-Dec-2021 21:02
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 21:02
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 21:02
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 21:02
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 21:02
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 21:02
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 21:02
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 21:02
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 21:02
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 21:02
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	15-Dec-2021 21:02
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 21:02
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	15-Dec-2021 21:02
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 21:02
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 21:02
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	15-Dec-2021 21:02
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	15-Dec-2021 21:02
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 21:02
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 21:02
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 21:02
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 21:02
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 21:02
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 21:02
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	15-Dec-2021 21:02
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 21:02
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 21:02
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 21:02
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 21:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
Sample ID: LHSMW06_120221_a
Collection Date: 02-Dec-2021 10:20

ANALYTICAL REPORT
WorkOrder:HS21120243
Lab ID:HS21120243-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 21:02
cis-1,2-Dichloroethene	**130**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Dec-2021 21:02
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 21:02
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 21:02
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 21:02
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 21:02
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 21:02
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	15-Dec-2021 21:02
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 21:02
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	15-Dec-2021 21:02
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	15-Dec-2021 21:02
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 21:02
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 21:02
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 21:02
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 21:02
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 21:02
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 21:02
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 21:02
Tetrachloroethene	**3.2**		**0.30**	**1.0**	**1.0**	**ug/L**	1	15-Dec-2021 21:02
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 21:02
trans-1,2-Dichloroethene	**1.9**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Dec-2021 21:02
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 21:02
Trichloroethene	**20**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Dec-2021 21:02
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 21:02
Vinyl chloride	**4.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Dec-2021 21:02
Surr: 1,2-Dichloroethane-d4	*109*			**0**	*81-118*	*%REC*	*1*	*15-Dec-2021 21:02*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*15-Dec-2021 21:02*
Surr: Dibromofluoromethane	*99.8*			**0**	*80-119*	*%REC*	*1*	*15-Dec-2021 21:02*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*15-Dec-2021 21:02*
METALS BY ICPMS BY SW6020A		**Method:SW6020A**				Prep:SW3010A / 15-Dec-2021		Analyst: JHD
Arsenic	**0.000530**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	15-Dec-2021 22:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
Sample ID: Trip Blank
Collection Date: 02-Dec-2021 00:00

ANALYTICAL REPORT
WorkOrder:HS21120243
Lab ID:HS21120243-06
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 18:26
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 18:26
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 18:26
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 18:26
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 18:26
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 18:26
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 18:26
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	15-Dec-2021 18:26
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 18:26
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 18:26
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 18:26
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 18:26
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 18:26
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 18:26
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 18:26
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	15-Dec-2021 18:26
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	15-Dec-2021 18:26
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 18:26
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	15-Dec-2021 18:26
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	15-Dec-2021 18:26
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 18:26
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 18:26
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 18:26
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 18:26
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 18:26
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 18:26
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	15-Dec-2021 18:26
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 18:26
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 18:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
Sample ID: Trip Blank
Collection Date: 02-Dec-2021 00:00

ANALYTICAL REPORT
WorkOrder:HS21120243
Lab ID:HS21120243-06
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 18:26
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 18:26
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 18:26
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 18:26
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	15-Dec-2021 18:26
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	15-Dec-2021 18:26
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	15-Dec-2021 18:26
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 18:26
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 18:26
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 18:26
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 18:26
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 18:26
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 18:26
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 18:26
Surr: 1,2-Dichloroethane-d4	*108*			**0**	*81-118*	*%REC*	*1*	*15-Dec-2021 18:26*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*15-Dec-2021 18:26*
Surr: Dibromofluoromethane	*101*			**0**	*80-119*	*%REC*	*1*	*15-Dec-2021 18:26*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*15-Dec-2021 18:26*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243

Batch ID: 173565 **Start Date:** 15 Dec 2021 09:30 **End Date:** 15 Dec 2021 13:30
Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS21120243-04		10 (mL)	10 (mL)	1	120 plastic HNO3
HS21120243-05		10 (mL)	10 (mL)	1	120 plastic HNO3

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 173565 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS21120243-04	LHSMW06_120221	02 Dec 2021 10:20		15 Dec 2021 13:30	15 Dec 2021 22:06	1
HS21120243-05	LHSMW06_120221_a	02 Dec 2021 10:20		15 Dec 2021 13:30	15 Dec 2021 22:08	1
Batch ID: R397742 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21120243-06	Trip Blank	02 Dec 2021 00:00			15 Dec 2021 18:26	1
Batch ID: R397742 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21120243-01	35AWW24_120221	02 Dec 2021 08:05			15 Dec 2021 19:55	1
HS21120243-02	35AWW05_120221	02 Dec 2021 08:55			15 Dec 2021 15:49	1
HS21120243-03	35AWW15_120221	02 Dec 2021 09:35			15 Dec 2021 20:17	1
HS21120243-04	LHSMW06_120221	02 Dec 2021 10:20			15 Dec 2021 20:40	1
HS21120243-05	LHSMW06_120221_a	02 Dec 2021 10:20			15 Dec 2021 21:02	1

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243

QC BATCH REPORT

Batch ID: 173565 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-173565** Units: **mg/L** Analysis Date: **15-Dec-2021 21:25**
Client ID: Run ID: **ICPMS06_397733** SeqNo: **6424041** PrepDate: **15-Dec-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.00100	0.00500								U

LCS Sample ID: **LCS-173565** Units: **mg/L** Analysis Date: **15-Dec-2021 21:27**
Client ID: Run ID: **ICPMS06_397733** SeqNo: **6424042** PrepDate: **15-Dec-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05307	0.00500	0.05	0	106	84 - 116				

MS Sample ID: **HS21120092-05MS** Units: **mg/L** Analysis Date: **15-Dec-2021 21:33**
Client ID: Run ID: **ICPMS06_397733** SeqNo: **6424045** PrepDate: **15-Dec-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05642	0.00500	0.05	0.001712	109	84 - 116				

MSD Sample ID: **HS21120092-05MSD** Units: **mg/L** Analysis Date: **15-Dec-2021 21:35**
Client ID: Run ID: **ICPMS06_397733** SeqNo: **6424046** PrepDate: **15-Dec-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05688	0.00500	0.05	0.001712	110	84 - 116	0.05642	0.809	20	

SD Sample ID: **HS21120092-05SD** Units: **mg/L** Analysis Date: **15-Dec-2021 21:31**
Client ID: Run ID: **ICPMS06_397733** SeqNo: **6424044** PrepDate: **15-Dec-2021** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	0.00500	0.0250					0.001712	0	10	U

The following samples were analyzed in this batch: HS21120243-04 HS21120243-05

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243

QC BATCH REPORT

Batch ID: R397742 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-211215** Units: **ug/L** Analysis Date: **15-Dec-2021 14:20**
Client ID: Run ID: **VOA9_397742** SeqNo: **6424266** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1.0	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	1.0	1.0								U
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	1.0	1.0								U
1,2,3-Trichlorobenzene	1.0	1.0								U
1,2,3-Trichloropropane	1.0	1.0								U
1,2,4-Trichlorobenzene	1.0	1.0								U
1,2,4-Trimethylbenzene	1.0	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	1.0	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	1.0	1.0								U
1,3,5-Trimethylbenzene	1.0	1.0								U
1,3-Dichlorobenzene	1.0	1.0								U
1,3-Dichloropropane	1.0	1.0								U
1,4-Dichlorobenzene	1.0	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	1.0	1.0								U
2-Hexanone	2.0	2.0								U
4-Chlorotoluene	1.0	1.0								U
4-Isopropyltoluene	1.0	1.0								U
4-Methyl-2-pentanone	2.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	1.0	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	1.0	1.0								U
Bromomethane	1.0	1.0								U

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243

QC BATCH REPORT

Batch ID: R397742 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-211215** Units: **ug/L** Analysis Date: **15-Dec-2021 14:20**
Client ID: Run ID: **VOA9_397742** SeqNo: **6424266** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	2.0	2.0								U
Carbon tetrachloride	1.0	1.0								U
Chlorobenzene	1.0	1.0								U
Chloroethane	1.0	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	1.0	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	1.0	1.0								U
Ethylbenzene	1.0	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	1.0	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	2.0	2.0								U
Naphthalene	1.0	1.0								U
n-Butylbenzene	1.0	1.0								U
n-Propylbenzene	1.0	1.0								U
o-Xylene	1.0	1.0								U
sec-Butylbenzene	1.0	1.0								U
Styrene	1.0	1.0								U
tert-Butylbenzene	1.0	1.0								U
Tetrachloroethene	1.0	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	1.0	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*52.97*	*1.0*	*50*	*0*	*106*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.84*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*49.99*	*1.0*	*50*	*0*	*100.0*	*80 - 119*				
Surr: Toluene-d8	*52.2*	*1.0*	*50*	*0*	*104*	*89 - 112*				

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243

QC BATCH REPORT

Batch ID: R397742 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-211215** Units: **ug/L** Analysis Date: **15-Dec-2021 13:35**
Client ID: Run ID: **VOA9_397742** SeqNo: **6424265** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.3	1.0	20	0	96.5	78 - 124				
1,1,1-Trichloroethane	21.63	1.0	20	0	108	74 - 131				
1,1,2,2-Tetrachloroethane	22.83	1.0	20	0	114	71 - 121				
1,1,2-Trichloroethane	22.77	1.0	20	0	114	80 - 119				
1,1-Dichloroethane	23.89	1.0	20	0	119	77 - 125				
1,1-Dichloroethene	21	1.0	20	0	105	71 - 131				
1,1-Dichloropropene	20.96	1.0	20	0	105	78 - 125				
1,2,3-Trichlorobenzene	18	1.0	20	0	90.0	69 - 129				
1,2,3-Trichloropropane	21.63	1.0	20	0	108	73 - 122				
1,2,4-Trichlorobenzene	18.37	1.0	20	0	91.9	69 - 130				
1,2,4-Trimethylbenzene	20.43	1.0	20	0	102	76 - 124				
1,2-Dibromo-3-chloropropane	16.58	1.0	20	0	82.9	62 - 128				
1,2-Dibromoethane	22.2	1.0	20	0	111	77 - 121				
1,2-Dichlorobenzene	20.27	1.0	20	0	101	80 - 119				
1,2-Dichloroethane	22.5	1.0	20	0	112	73 - 128				
1,2-Dichloropropane	22.76	1.0	20	0	114	78 - 122				
1,3,5-Trimethylbenzene	19.58	1.0	20	0	97.9	75 - 124				
1,3-Dichlorobenzene	19.81	1.0	20	0	99.0	80 - 119				
1,3-Dichloropropane	22.42	1.0	20	0	112	80 - 119				
1,4-Dichlorobenzene	20.04	1.0	20	0	100	79 - 118				
2,2-Dichloropropane	22.78	1.0	20	0	114	60 - 139				
2-Butanone	42.64	2.0	40	0	107	56 - 143				
2-Chlorotoluene	21.34	1.0	20	0	107	79 - 122				
2-Hexanone	45.87	2.0	40	0	115	57 - 139				
4-Chlorotoluene	21.5	1.0	20	0	107	78 - 122				
4-Isopropyltoluene	18.8	1.0	20	0	94.0	77 - 127				
4-Methyl-2-pentanone	42.58	2.0	40	0	106	67 - 130				
Acetone	51.75	2.0	40	0	129	39 - 160				
Benzene	21.95	1.0	20	0	110	79 - 120				
Bromobenzene	20.69	1.0	20	0	103	80 - 120				
Bromochloromethane	22.51	1.0	20	0	113	78 - 123				
Bromodichloromethane	20.2	1.0	20	0	101	79 - 125				
Bromoform	16.46	1.0	20	0	82.3	66 - 130				
Bromomethane	23.52	1.0	20	0	118	53 - 141				

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243

QC BATCH REPORT

Batch ID: R397742 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-211215** Units: **ug/L** Analysis Date: **15-Dec-2021 13:35**
Client ID: Run ID: **VOA9_397742** SeqNo: **6424265** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	43.47	2.0	40	0	109	64 - 133				
Carbon tetrachloride	18.45	1.0	20	0	92.3	72 - 136				
Chlorobenzene	20.53	1.0	20	0	103	82 - 118				
Chloroethane	22.67	1.0	20	0	113	60 - 138				
Chloroform	23.87	1.0	20	0	119	79 - 124				
Chloromethane	25.52	1.0	20	0	128	50 - 139				
cis-1,2-Dichloroethene	22.24	1.0	20	0	111	78 - 123				
cis-1,3-Dichloropropene	19.66	1.0	20	0	98.3	75 - 124				
Dibromochloromethane	18.67	1.0	20	0	93.3	74 - 126				
Dibromomethane	22.26	1.0	20	0	111	79 - 123				
Dichlorodifluoromethane	22.47	1.0	20	0	112	32 - 152				
Ethylbenzene	19.88	1.0	20	0	99.4	79 - 121				
Hexachlorobutadiene	19.34	1.0	20	0	96.7	66 - 134				
Isopropylbenzene	18.87	1.0	20	0	94.3	72 - 131				
m,p-Xylene	40.8	2.0	40	0	102	80 - 121				
Methylene chloride	22.03	2.0	20	0	110	74 - 124				
Naphthalene	18.05	1.0	20	0	90.3	61 - 128				
n-Butylbenzene	19.76	1.0	20	0	98.8	75 - 128				
n-Propylbenzene	20.46	1.0	20	0	102	76 - 126				
o-Xylene	20.45	1.0	20	0	102	78 - 122				
sec-Butylbenzene	18.66	1.0	20	0	93.3	77 - 126				
Styrene	21.32	1.0	20	0	107	78 - 123				
tert-Butylbenzene	18.31	1.0	20	0	91.6	78 - 124				
Tetrachloroethene	17.51	1.0	20	0	87.6	74 - 129				
Toluene	21.28	1.0	20	0	106	80 - 121				
trans-1,2-Dichloroethene	22.01	1.0	20	0	110	75 - 124				
trans-1,3-Dichloropropene	19.1	1.0	20	0	95.5	73 - 127				
Trichloroethene	19.93	1.0	20	0	99.6	79 - 123				
Trichlorofluoromethane	22.27	1.0	20	0	111	65 - 141				
Vinyl chloride	22.46	1.0	20	0	112	58 - 137				
Surr: 1,2-Dichloroethane-d4	*57.98*	*1.0*	*50*	*0*	*116*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.12*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*53.89*	*1.0*	*50*	*0*	*108*	*80 - 119*				
Surr: Toluene-d8	*49.7*	*1.0*	*50*	*0*	*99.4*	*89 - 112*				

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243

QC BATCH REPORT

Batch ID: R397742 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21120255-05MS** Units: **ug/L** Analysis Date: **15-Dec-2021 17:19**
Client ID: Run ID: **VOA9_397742** SeqNo: **6424274** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.38	1.0	20	0	96.9	78 - 124				
1,1,1-Trichloroethane	22.12	1.0	20	0	111	74 - 131				
1,1,2,2-Tetrachloroethane	21.76	1.0	20	0	109	71 - 121				
1,1,2-Trichloroethane	22.12	1.0	20	0	111	80 - 119				
1,1-Dichloroethane	22.96	1.0	20	0	115	77 - 125				
1,1-Dichloroethene	20.94	1.0	20	0	105	71 - 131				
1,1-Dichloropropene	22.67	1.0	20	0	113	78 - 125				
1,2,3-Trichlorobenzene	17.88	1.0	20	0	89.4	69 - 129				
1,2,3-Trichloropropane	21.01	1.0	20	0	105	73 - 122				
1,2,4-Trichlorobenzene	18.39	1.0	20	0	92.0	69 - 130				
1,2,4-Trimethylbenzene	22.77	1.0	20	0	114	76 - 124				
1,2-Dibromo-3-chloropropane	15.21	1.0	20	0	76.0	62 - 128				
1,2-Dibromoethane	21.21	1.0	20	0	106	77 - 121				
1,2-Dichlorobenzene	20.74	1.0	20	0	104	80 - 119				
1,2-Dichloroethane	21.73	1.0	20	0	109	73 - 128				
1,2-Dichloropropane	22.6	1.0	20	0	113	78 - 122				
1,3,5-Trimethylbenzene	22.25	1.0	20	0	111	75 - 124				
1,3-Dichlorobenzene	20.2	1.0	20	0	101	80 - 119				
1,3-Dichloropropane	22.1	1.0	20	0	110	80 - 119				
1,4-Dichlorobenzene	20.78	1.0	20	0	104	79 - 118				
2,2-Dichloropropane	21.61	1.0	20	0	108	60 - 139				
2-Butanone	40.16	2.0	40	2.307	94.6	56 - 143				
2-Chlorotoluene	22.4	1.0	20	0	112	79 - 122				
2-Hexanone	42.53	2.0	40	0	106	57 - 139				
4-Chlorotoluene	22.72	1.0	20	0	114	78 - 122				
4-Isopropyltoluene	22.28	1.0	20	0	111	77 - 127				
4-Methyl-2-pentanone	40.72	2.0	40	0	102	67 - 130				
Acetone	50.01	2.0	40	5.863	110	39 - 160				
Benzene	22.45	1.0	20	0	112	79 - 120				
Bromobenzene	20.68	1.0	20	0	103	80 - 120				
Bromochloromethane	20.82	1.0	20	0	104	78 - 123				
Bromodichloromethane	20.61	1.0	20	0	103	79 - 125				
Bromoform	15.34	1.0	20	0	76.7	66 - 130				
Bromomethane	21.16	1.0	20	0	106	53 - 141				

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243

QC BATCH REPORT

Batch ID: R397742 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21120255-05MS** Units: **ug/L** Analysis Date: **15-Dec-2021 17:19**
Client ID: Run ID: **VOA9_397742** SeqNo: **6424274** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	42.52	2.0	40	0	106	64 - 133				
Carbon tetrachloride	20.24	1.0	20	0	101	72 - 136				
Chlorobenzene	21.03	1.0	20	0	105	82 - 118				
Chloroethane	20.46	1.0	20	0	102	60 - 138				
Chloroform	25.76	1.0	20	3.906	109	79 - 124				
Chloromethane	19.39	1.0	20	0	97.0	50 - 139				
cis-1,2-Dichloroethene	22.14	1.0	20	1.081	105	78 - 123				
cis-1,3-Dichloropropene	18.52	1.0	20	0	92.6	75 - 124				
Dibromochloromethane	18.45	1.0	20	1.92	82.7	74 - 126				
Dibromomethane	20.81	1.0	20	0	104	79 - 123				
Dichlorodifluoromethane	10.46	1.0	20	0	52.3	32 - 152				
Ethylbenzene	21.81	1.0	20	0	109	79 - 121				
Hexachlorobutadiene	17.9	1.0	20	0	89.5	66 - 134				
Isopropylbenzene	21.92	1.0	20	0	110	72 - 131				
m,p-Xylene	43.88	2.0	40	0	110	80 - 121				
Methylene chloride	20.64	2.0	20	0	103	74 - 124				
Naphthalene	17.79	1.0	20	0	89.0	61 - 128				
n-Butylbenzene	22.31	1.0	20	0	112	75 - 128				
n-Propylbenzene	23.67	1.0	20	0	118	76 - 126				
o-Xylene	21.43	1.0	20	0	107	78 - 122				
sec-Butylbenzene	22.54	1.0	20	0	113	77 - 126				
Styrene	21.88	1.0	20	0	109	78 - 123				
tert-Butylbenzene	21.79	1.0	20	0	109	78 - 124				
Tetrachloroethene	19.77	1.0	20	0	98.8	74 - 129				
Toluene	22.54	1.0	20	0.7037	109	80 - 121				
trans-1,2-Dichloroethene	21.23	1.0	20	0	106	75 - 124				
trans-1,3-Dichloropropene	17.83	1.0	20	0	89.2	73 - 127				
Trichloroethene	20.96	1.0	20	0	105	79 - 123				
Trichlorofluoromethane	21.27	1.0	20	0	106	65 - 141				
Vinyl chloride	19.38	1.0	20	0	96.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.56*	*1.0*	*50*	*0*	*105*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.66*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*51.54*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*52.39*	*1.0*	*50*	*0*	*105*	*89 - 112*				

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243

QC BATCH REPORT

Batch ID: R397742 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21120243-02MS** Units: **ug/L** Analysis Date: **15-Dec-2021 16:34**
Client ID: **35AWW05_120221** Run ID: **VOA9_397742** SeqNo: **6424272** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.8	1.0	20	0	94.0	78 - 124				
1,1,1-Trichloroethane	20.6	1.0	20	0	103	74 - 131				
1,1,2,2-Tetrachloroethane	21.33	1.0	20	0	107	71 - 121				
1,1,2-Trichloroethane	21.74	1.0	20	0	109	80 - 119				
1,1-Dichloroethane	22.2	1.0	20	0	111	77 - 125				
1,1-Dichloroethene	19.52	1.0	20	0	97.6	71 - 131				
1,1-Dichloropropene	21.12	1.0	20	0	106	78 - 125				
1,2,3-Trichlorobenzene	15.7	1.0	20	0	78.5	69 - 129				
1,2,3-Trichloropropane	20.5	1.0	20	0	103	73 - 122				
1,2,4-Trichlorobenzene	15.97	1.0	20	0	79.9	69 - 130				
1,2,4-Trimethylbenzene	19.69	1.0	20	0	98.5	76 - 124				
1,2-Dibromo-3-chloropropane	14.81	1.0	20	0	74.0	62 - 128				
1,2-Dibromoethane	20.99	1.0	20	0	105	77 - 121				
1,2-Dichlorobenzene	18.8	1.0	20	0	94.0	80 - 119				
1,2-Dichloroethane	21.87	1.0	20	0	109	73 - 128				
1,2-Dichloropropane	22.39	1.0	20	0	112	78 - 122				
1,3,5-Trimethylbenzene	19.51	1.0	20	0	97.6	75 - 124				
1,3-Dichlorobenzene	18.34	1.0	20	0	91.7	80 - 119				
1,3-Dichloropropane	22.22	1.0	20	0	111	80 - 119				
1,4-Dichlorobenzene	18.83	1.0	20	0	94.2	79 - 118				
2,2-Dichloropropane	20.5	1.0	20	0	102	60 - 139				
2-Butanone	38.11	2.0	40	0	95.3	56 - 143				
2-Chlorotoluene	20.43	1.0	20	0	102	79 - 122				
2-Hexanone	43.27	2.0	40	0	108	57 - 139				
4-Chlorotoluene	20.76	1.0	20	0	104	78 - 122				
4-Isopropyltoluene	18.85	1.0	20	0	94.3	77 - 127				
4-Methyl-2-pentanone	40.99	2.0	40	0	102	67 - 130				
Acetone	39.19	2.0	40	0	98.0	39 - 160				
Benzene	21.51	1.0	20	0	108	79 - 120				
Bromobenzene	19.18	1.0	20	0	95.9	80 - 120				
Bromochloromethane	20.71	1.0	20	0	104	78 - 123				
Bromodichloromethane	19.38	1.0	20	0	96.9	79 - 125				
Bromoform	15.3	1.0	20	0	76.5	66 - 130				
Bromomethane	21.26	1.0	20	0	106	53 - 141				

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243

QC BATCH REPORT

Batch ID: R397742 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21120243-02MS** Units: **ug/L** Analysis Date: **15-Dec-2021 16:34**
Client ID: **35AWW05_120221** Run ID: **VOA9_397742** SeqNo: **6424272** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	39.34	2.0	40	0	98.4	64 - 133				
Carbon tetrachloride	18.67	1.0	20	0	93.3	72 - 136				
Chlorobenzene	20.05	1.0	20	0	100	82 - 118				
Chloroethane	19.29	1.0	20	0	96.5	60 - 138				
Chloroform	21.7	1.0	20	0	108	79 - 124				
Chloromethane	18.27	1.0	20	0	91.4	50 - 139				
cis-1,2-Dichloroethene	21.42	1.0	20	0	107	78 - 123				
cis-1,3-Dichloropropene	18.2	1.0	20	0	91.0	75 - 124				
Dibromochloromethane	17.35	1.0	20	0	86.8	74 - 126				
Dibromomethane	20.87	1.0	20	0	104	79 - 123				
Dichlorodifluoromethane	8.867	1.0	20	0	44.3	32 - 152				
Ethylbenzene	20.32	1.0	20	0	102	79 - 121				
Hexachlorobutadiene	15.46	1.0	20	0	77.3	66 - 134				
Isopropylbenzene	20.11	1.0	20	0	101	72 - 131				
m,p-Xylene	41.17	2.0	40	0	103	80 - 121				
Methylene chloride	19.82	2.0	20	0	99.1	74 - 124				
Naphthalene	16.09	1.0	20	0	80.5	61 - 128				
n-Butylbenzene	19.47	1.0	20	0	97.4	75 - 128				
n-Propylbenzene	20.92	1.0	20	0	105	76 - 126				
o-Xylene	20.22	1.0	20	0	101	78 - 122				
sec-Butylbenzene	19.38	1.0	20	0	96.9	77 - 126				
Styrene	20.51	1.0	20	0	103	78 - 123				
tert-Butylbenzene	19.18	1.0	20	0	95.9	78 - 124				
Tetrachloroethene	18.15	1.0	20	0	90.8	74 - 129				
Toluene	21.24	1.0	20	0	106	80 - 121				
trans-1,2-Dichloroethene	20.03	1.0	20	0	100	75 - 124				
trans-1,3-Dichloropropene	17.45	1.0	20	0	87.2	73 - 127				
Trichloroethene	19.63	1.0	20	0	98.2	79 - 123				
Trichlorofluoromethane	19.17	1.0	20	0	95.9	65 - 141				
Vinyl chloride	17.27	1.0	20	0	86.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.69*	*1.0*	*50*	*0*	*105*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.69*	*1.0*	*50*	*0*	*107*	*85 - 114*				
Surr: Dibromofluoromethane	*50.62*	*1.0*	*50*	*0*	*101*	*80 - 119*				
Surr: Toluene-d8	*52.85*	*1.0*	*50*	*0*	*106*	*89 - 112*				

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243

QC BATCH REPORT

Batch ID: R397742 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS21120255-05MSD** Units: **ug/L** Analysis Date: **15-Dec-2021 17:41**
Client ID: Run ID: **VOA9_397742** SeqNo: **6424275** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.45	1.0	20	0	92.3	78 - 124	19.38	4.93	20	
1,1,1-Trichloroethane	20.99	1.0	20	0	105	74 - 131	22.12	5.24	20	
1,1,2,2-Tetrachloroethane	21.44	1.0	20	0	107	71 - 121	21.76	1.47	20	
1,1,2-Trichloroethane	21.03	1.0	20	0	105	80 - 119	22.12	5.03	20	
1,1-Dichloroethane	21.52	1.0	20	0	108	77 - 125	22.96	6.48	20	
1,1-Dichloroethene	19.84	1.0	20	0	99.2	71 - 131	20.94	5.42	20	
1,1-Dichloropropene	22.08	1.0	20	0	110	78 - 125	22.67	2.61	20	
1,2,3-Trichlorobenzene	17.56	1.0	20	0	87.8	69 - 129	17.88	1.78	20	
1,2,3-Trichloropropane	20.98	1.0	20	0	105	73 - 122	21.01	0.128	20	
1,2,4-Trichlorobenzene	17.87	1.0	20	0	89.4	69 - 130	18.39	2.88	20	
1,2,4-Trimethylbenzene	22.11	1.0	20	0	111	76 - 124	22.77	2.91	20	
1,2-Dibromo-3-chloropropane	15.39	1.0	20	0	77.0	62 - 128	15.21	1.22	20	
1,2-Dibromoethane	20.52	1.0	20	0	103	77 - 121	21.21	3.3	20	
1,2-Dichlorobenzene	19.78	1.0	20	0	98.9	80 - 119	20.74	4.73	20	
1,2-Dichloroethane	21.23	1.0	20	0	106	73 - 128	21.73	2.35	20	
1,2-Dichloropropane	21.86	1.0	20	0	109	78 - 122	22.6	3.36	20	
1,3,5-Trimethylbenzene	21.24	1.0	20	0	106	75 - 124	22.25	4.66	20	
1,3-Dichlorobenzene	19.44	1.0	20	0	97.2	80 - 119	20.2	3.83	20	
1,3-Dichloropropane	21.25	1.0	20	0	106	80 - 119	22.1	3.94	20	
1,4-Dichlorobenzene	19.92	1.0	20	0	99.6	79 - 118	20.78	4.21	20	
2,2-Dichloropropane	20.05	1.0	20	0	100	60 - 139	21.61	7.47	20	
2-Butanone	40.11	2.0	40	2.307	94.5	56 - 143	40.16	0.125	20	
2-Chlorotoluene	21.47	1.0	20	0	107	79 - 122	22.4	4.22	20	
2-Hexanone	43.44	2.0	40	0	109	57 - 139	42.53	2.1	20	
4-Chlorotoluene	21.8	1.0	20	0	109	78 - 122	22.72	4.15	20	
4-Isopropyltoluene	21.26	1.0	20	0	106	77 - 127	22.28	4.71	20	
4-Methyl-2-pentanone	40.02	2.0	40	0	100	67 - 130	40.72	1.74	20	
Acetone	49.15	2.0	40	5.863	108	39 - 160	50.01	1.75	20	
Benzene	21.4	1.0	20	0	107	79 - 120	22.45	4.79	20	
Bromobenzene	19.74	1.0	20	0	98.7	80 - 120	20.68	4.64	20	
Bromochloromethane	20.12	1.0	20	0	101	78 - 123	20.82	3.41	20	
Bromodichloromethane	20.31	1.0	20	0	102	79 - 125	20.61	1.46	20	
Bromoform	15.07	1.0	20	0	75.3	66 - 130	15.34	1.84	20	
Bromomethane	19.72	1.0	20	0	98.6	53 - 141	21.16	7.06	20	

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243

QC BATCH REPORT

Batch ID: R397742 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS21120255-05MSD** Units: **ug/L** Analysis Date: **15-Dec-2021 17:41**
Client ID: Run ID: **VOA9_397742** SeqNo: **6424275** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	40.25	2.0	40	0	101	64 - 133	42.52	5.49	20	
Carbon tetrachloride	19.33	1.0	20	0	96.7	72 - 136	20.24	4.55	20	
Chlorobenzene	20.05	1.0	20	0	100	82 - 118	21.03	4.76	20	
Chloroethane	19.36	1.0	20	0	96.8	60 - 138	20.46	5.53	20	
Chloroform	24.52	1.0	20	3.906	103	79 - 124	25.76	4.97	20	
Chloromethane	18.17	1.0	20	0	90.9	50 - 139	19.39	6.48	20	
cis-1,2-Dichloroethene	21.01	1.0	20	1.081	99.6	78 - 123	22.14	5.27	20	
cis-1,3-Dichloropropene	18.09	1.0	20	0	90.4	75 - 124	18.52	2.37	20	
Dibromochloromethane	18	1.0	20	1.92	80.4	74 - 126	18.45	2.47	20	
Dibromomethane	20.25	1.0	20	0	101	79 - 123	20.81	2.71	20	
Dichlorodifluoromethane	9.794	1.0	20	0	49.0	32 - 152	10.46	6.58	20	
Ethylbenzene	20.48	1.0	20	0	102	79 - 121	21.81	6.31	20	
Hexachlorobutadiene	17.97	1.0	20	0	89.9	66 - 134	17.9	0.423	20	
Isopropylbenzene	21.08	1.0	20	0	105	72 - 131	21.92	3.89	20	
m,p-Xylene	41.98	2.0	40	0	105	80 - 121	43.88	4.44	20	
Methylene chloride	19.76	2.0	20	0	98.8	74 - 124	20.64	4.36	20	
Naphthalene	17.56	1.0	20	0	87.8	61 - 128	17.79	1.34	20	
n-Butylbenzene	21.66	1.0	20	0	108	75 - 128	22.31	2.99	20	
n-Propylbenzene	22.46	1.0	20	0	112	76 - 126	23.67	5.26	20	
o-Xylene	20.42	1.0	20	0	102	78 - 122	21.43	4.83	20	
sec-Butylbenzene	21.75	1.0	20	0	109	77 - 126	22.54	3.58	20	
Styrene	21.04	1.0	20	0	105	78 - 123	21.88	3.92	20	
tert-Butylbenzene	21.26	1.0	20	0	106	78 - 124	21.79	2.43	20	
Tetrachloroethene	18.84	1.0	20	0	94.2	74 - 129	19.77	4.82	20	
Toluene	21.45	1.0	20	0.7037	104	80 - 121	22.54	4.96	20	
trans-1,2-Dichloroethene	19.98	1.0	20	0	99.9	75 - 124	21.23	6.09	20	
trans-1,3-Dichloropropene	17.5	1.0	20	0	87.5	73 - 127	17.83	1.91	20	
Trichloroethene	19.95	1.0	20	0	99.7	79 - 123	20.96	4.97	20	
Trichlorofluoromethane	19.83	1.0	20	0	99.2	65 - 141	21.27	6.98	20	
Vinyl chloride	18	1.0	20	0	90.0	58 - 137	19.38	7.38	20	
Surr: 1,2-Dichloroethane-d4	*52.37*	*1.0*	*50*	*0*	*105*	*81 - 118*	*52.56*	*0.359*	*20*	
Surr: 4-Bromofluorobenzene	*52.2*	*1.0*	*50*	*0*	*104*	*85 - 114*	*52.66*	*0.863*	*20*	
Surr: Dibromofluoromethane	*50.31*	*1.0*	*50*	*0*	*101*	*80 - 119*	*51.54*	*2.41*	*20*	
Surr: Toluene-d8	*52.5*	*1.0*	*50*	*0*	*105*	*89 - 112*	*52.39*	*0.205*	*20*	

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243

QC BATCH REPORT

Batch ID: R397742 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS21120243-02MSD** Units: **ug/L** Analysis Date: **15-Dec-2021 16:56**
Client ID: **35AWW05_120221** Run ID: **VOA9_397742** SeqNo: **6424273** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.72	1.0	20	0	93.6	78 - 124	18.8	0.439	20	
1,1,1-Trichloroethane	20.3	1.0	20	0	102	74 - 131	20.6	1.46	20	
1,1,2,2-Tetrachloroethane	21.94	1.0	20	0	110	71 - 121	21.33	2.82	20	
1,1,2-Trichloroethane	21.91	1.0	20	0	110	80 - 119	21.74	0.76	20	
1,1-Dichloroethane	22.03	1.0	20	0	110	77 - 125	22.2	0.779	20	
1,1-Dichloroethene	19.04	1.0	20	0	95.2	71 - 131	19.52	2.46	20	
1,1-Dichloropropene	20.27	1.0	20	0	101	78 - 125	21.12	4.08	20	
1,2,3-Trichlorobenzene	16.6	1.0	20	0	83.0	69 - 129	15.7	5.61	20	
1,2,3-Trichloropropane	21.52	1.0	20	0	108	73 - 122	20.5	4.83	20	
1,2,4-Trichlorobenzene	16.27	1.0	20	0	81.3	69 - 130	15.97	1.83	20	
1,2,4-Trimethylbenzene	19.84	1.0	20	0	99.2	76 - 124	19.69	0.75	20	
1,2-Dibromo-3-chloropropane	16.02	1.0	20	0	80.1	62 - 128	14.81	7.87	20	
1,2-Dibromoethane	21.37	1.0	20	0	107	77 - 121	20.99	1.78	20	
1,2-Dichlorobenzene	19.14	1.0	20	0	95.7	80 - 119	18.8	1.82	20	
1,2-Dichloroethane	21.56	1.0	20	0	108	73 - 128	21.87	1.43	20	
1,2-Dichloropropane	22.22	1.0	20	0	111	78 - 122	22.39	0.787	20	
1,3,5-Trimethylbenzene	19.66	1.0	20	0	98.3	75 - 124	19.51	0.783	20	
1,3-Dichlorobenzene	18.31	1.0	20	0	91.6	80 - 119	18.34	0.148	20	
1,3-Dichloropropane	22.27	1.0	20	0	111	80 - 119	22.22	0.208	20	
1,4-Dichlorobenzene	18.82	1.0	20	0	94.1	79 - 118	18.83	0.0644	20	
2,2-Dichloropropane	20.26	1.0	20	0	101	60 - 139	20.5	1.16	20	
2-Butanone	38.86	2.0	40	0	97.1	56 - 143	38.11	1.95	20	
2-Chlorotoluene	20.57	1.0	20	0	103	79 - 122	20.43	0.68	20	
2-Hexanone	44.35	2.0	40	0	111	57 - 139	43.27	2.47	20	
4-Chlorotoluene	20.55	1.0	20	0	103	78 - 122	20.76	0.988	20	
4-Isopropyltoluene	18.73	1.0	20	0	93.6	77 - 127	18.85	0.666	20	
4-Methyl-2-pentanone	41.75	2.0	40	0	104	67 - 130	40.99	1.85	20	
Acetone	40.18	2.0	40	0	100	39 - 160	39.19	2.51	20	
Benzene	21.22	1.0	20	0	106	79 - 120	21.51	1.39	20	
Bromobenzene	19.26	1.0	20	0	96.3	80 - 120	19.18	0.406	20	
Bromochloromethane	21.1	1.0	20	0	106	78 - 123	20.71	1.86	20	
Bromodichloromethane	19.21	1.0	20	0	96.0	79 - 125	19.38	0.904	20	
Bromoform	15.2	1.0	20	0	76.0	66 - 130	15.3	0.659	20	
Bromomethane	20.66	1.0	20	0	103	53 - 141	21.26	2.87	20	

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243

QC BATCH REPORT

Batch ID: R397742 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS21120243-02MSD** Units: **ug/L** Analysis Date: **15-Dec-2021 16:56**
Client ID: **35AWW05_120221** Run ID: **VOA9_397742** SeqNo: **6424273** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	38.45	2.0	40	0	96.1	64 - 133	39.34	2.3	20	
Carbon tetrachloride	18.16	1.0	20	0	90.8	72 - 136	18.67	2.78	20	
Chlorobenzene	19.57	1.0	20	0	97.9	82 - 118	20.05	2.4	20	
Chloroethane	19.3	1.0	20	0	96.5	60 - 138	19.29	0.0699	20	
Chloroform	21.87	1.0	20	0	109	79 - 124	21.7	0.787	20	
Chloromethane	17.88	1.0	20	0	89.4	50 - 139	18.27	2.18	20	
cis-1,2-Dichloroethene	20.92	1.0	20	0	105	78 - 123	21.42	2.36	20	
cis-1,3-Dichloropropene	18.21	1.0	20	0	91.0	75 - 124	18.2	0.05	20	
Dibromochloromethane	17.43	1.0	20	0	87.1	74 - 126	17.35	0.433	20	
Dibromomethane	20.81	1.0	20	0	104	79 - 123	20.87	0.283	20	
Dichlorodifluoromethane	8.685	1.0	20	0	43.4	32 - 152	8.867	2.07	20	
Ethylbenzene	19.61	1.0	20	0	98.0	79 - 121	20.32	3.57	20	
Hexachlorobutadiene	16	1.0	20	0	80.0	66 - 134	15.46	3.42	20	
Isopropylbenzene	19.49	1.0	20	0	97.4	72 - 131	20.11	3.12	20	
m,p-Xylene	39.96	2.0	40	0	99.9	80 - 121	41.17	2.97	20	
Methylene chloride	19.95	2.0	20	0	99.8	74 - 124	19.82	0.688	20	
Naphthalene	17.26	1.0	20	0	86.3	61 - 128	16.09	7.02	20	
n-Butylbenzene	19.63	1.0	20	0	98.2	75 - 128	19.47	0.813	20	
n-Propylbenzene	20.72	1.0	20	0	104	76 - 126	20.92	0.949	20	
o-Xylene	20.17	1.0	20	0	101	78 - 122	20.22	0.249	20	
sec-Butylbenzene	19.37	1.0	20	0	96.9	77 - 126	19.38	0.0162	20	
Styrene	20.2	1.0	20	0	101	78 - 123	20.51	1.52	20	
tert-Butylbenzene	19.17	1.0	20	0	95.9	78 - 124	19.18	0.00987	20	
Tetrachloroethene	17.72	1.0	20	0	88.6	74 - 129	18.15	2.4	20	
Toluene	20.86	1.0	20	0	104	80 - 121	21.24	1.83	20	
trans-1,2-Dichloroethene	19.8	1.0	20	0	99.0	75 - 124	20.03	1.17	20	
trans-1,3-Dichloropropene	17.54	1.0	20	0	87.7	73 - 127	17.45	0.551	20	
Trichloroethene	19.25	1.0	20	0	96.3	79 - 123	19.63	1.95	20	
Trichlorofluoromethane	18.35	1.0	20	0	91.8	65 - 141	19.17	4.39	20	
Vinyl chloride	17.37	1.0	20	0	86.9	58 - 137	17.27	0.586	20	
Surr: 1,2-Dichloroethane-d4	*52.11*	*1.0*	*50*	*0*	*104*	*81 - 118*	*52.69*	*1.11*	*20*	
Surr: 4-Bromofluorobenzene	*52.81*	*1.0*	*50*	*0*	*106*	*85 - 114*	*53.69*	*1.64*	*20*	
Surr: Dibromofluoromethane	*51.42*	*1.0*	*50*	*0*	*103*	*80 - 119*	*50.62*	*1.57*	*20*	
Surr: Toluene-d8	*52.6*	*1.0*	*50*	*0*	*105*	*89 - 112*	*52.85*	*0.472*	*20*	

ALS Houston, US Date: 18-Dec-21

Client:	Bhate Environmental Associates, Inc.
Project:	LHAAP / Site 58
WorkOrder:	HS21120243

QC BATCH REPORT

Batch ID:	**R397742 (0)**	**Instrument:**	**VOA9**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch:

HS21120243-01	HS21120243-02	HS21120243-03	HS21120243-04
HS21120243-05	HS21120243-06		

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: **HS21120243**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	21-022-0	26-Mar-2022
Dept of Defense	PJLA L20-507-R2	22-Dec-2021
Florida	E87611-33	30-Jun-2022
Illinois	2000322021-7	09-May-2022
Kansas	E-10352 2021-2022	31-Jul-2022
Kentucky	123043, 2021-2022	30-Apr-2022
Louisiana	03087, 2021-2022	30-Jun-2022
North Carolina	624-2021	31-Dec-2021
Texas	T104704231-21-28	30-Apr-2022

ALS Houston, US Date: 18-Dec-21

Sample Receipt Checklist

Work Order ID: HS21120243 **Date/Time Received:** 03-Dec-2021 10:45

Client Name: Bhate Environmental **Received by:** Jared R. Makan

Completed By:	/S/ Paresh M. Giga	04-Dec-2021 10:14	**Reviewed by:**	/S/ Ragen Giga	08-Dec-2021 17:11
	eSignature	Date/Time		eSignature	Date/Time

Matrices: **GW/Water** Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:none
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.3C U/c	IR31
Cooler(s)/Kit(s):	46489	
Date/Time sample(s) sent to storage:	12/3/2021 19:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

bhate

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 58

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code [2]	Sample Number [3]	Sample Matrix [4]	Number of containers	VOC	MEE	TOC	Carbon Dioxide	Anions	Arsenic					Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
35AWW24_120221	02 Dec 2021	0805	-	N		WG	3	X													
35AWW05_120221	02 Dec 2021	0855	-	N		WG	3	X													
35AWW05_120221_MS	02 Dec 2021	0855	-	MS		WG	3	X													
35AWW05_120221_MSD	02 Dec 2021	0855		MSD		WG	3	X													
35AWW15_120221	02 Dec 2021	0935		N		WG	3	X													
LHSMW06_120221	02 Dec 2021	1020	-	N		WG	4	X					X								
LHSMW06_120221_A	02 Dec 2021	1020	-	FD		WG	4	X					X								
TRIPBLANK	02 Dec 2021		-	TB		W	2	X													
			-																		
			-																		
			-																		

Sample Analysis Requested [5]

Quality Assurance Samples [6]

HS2112024 3

Bhate Environmental Associates, Inc.
LHAAP / Site 58

COMMENTS: STANDARD TAT

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	12/2/21	1430	1. J. Summy	12/3/21	10:45
2.			2.		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: ____ Shipped ____ No.:

Method of Shipment: ____

____ Fed Ex ____ Airbill Number:

Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

Cooler 46489 Temp 1.3°C 1231 CFO

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

46489

CUSTODY SEAL

Date: 12/2/21 Time: 1430
Name: Scott Beesinger
Company: BHATE

Seal Broken By: am
Date: 12/03/21

46489

46489

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202

MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 19NOV21
ACTWGT: 1.00 LB MAN
CAD: 0221247/CAFE3502
DIMS: 26x14x14 IN

TO SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON TX 77099
(281) 530-6656
REF: LHAAP-58-BO 81895-RG
RMA:

FedEx Express

TRK# 5309 5225 1401
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

4230674 02Dec2021 GGGA 5E0G3/E934/1093

HS21120243 8260

ALS WO# HS21120243

MSVOA09 -Logbook

Batch: 47180
Date: 11-15-2021
Method: 8260
Comments:

Analyst: Presenta Cabascango
Reviewer:
Laboratory: Houston

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
1	BFB	TUNE	11-15-2021 01:30 pm	1.00	50 mL	50 mL	U111501.D	Liquid	Y	NA
2	VSTD000.25	ICAL1	11-15-2021 01:52 pm	1.00	50 mL	50 mL	U111502.D	Liquid	Y	NA
3	VSTD000.5	ICAL2	11-15-2021 02:36 pm	1.00	50 mL	50 mL	U111503.D	Liquid	Y	NA
4	VSTD001	ICAL3	11-15-2021 02:58 pm	1.00	50 mL	50 mL	U111504.D	Liquid	Y	NA
5	VSTD002	ICAL4	11-15-2021 03:20 pm	1.00	50 mL	50 mL	U111505.D	Liquid	Y	NA
6	VSTD005	ICAL5	11-15-2021 03:43 pm	1.00	50 mL	50 mL	U111506.D	Liquid	Y	NA
7	VSTD020	ICAL6	11-15-2021 04:05 pm	1.00	50 mL	50 mL	U111507.D	Liquid	Y	NA
8	VSTD050	ICAL7	11-15-2021 04:27 pm	1.00	50 mL	50 mL	U111508.D	Liquid	Y	NA
9	VSTD100	ICAL8	11-15-2021 04:49 pm	1.00	50 mL	50 mL	U111509.D	Liquid	Y	NA
10	VSTD150	ICAL9	11-15-2021 05:11 pm	1.00	50 mL	50 mL	U111510.D	Liquid	Y	NA
11	VSTD200	ICAL	11-15-2021 05:34 pm	1.00	50 mL	50 mL	U111511.D	Liquid	Y	NA
12	BLANK	SAMP	11-15-2021 05:56 pm	1.00	50 mL	50 mL	U111512.D	Liquid	Y	NA
13	VSTD050	CCV	11-15-2021 06:18 pm	1.00	50 mL	50 mL	U111513.D	Liquid	Y	NA
14	BLANK	SAMP	11-15-2021 06:40 pm	1.00	50 mL	50 mL	U111514.D	Liquid	Y	NA
15	CCB	SAMP	11-15-2021 07:03 pm	1.00	50 mL	50 mL	U111515.D	Liquid	Y	NA
16	VLCSW-211115	LCS	11-15-2021 07:25 pm	1.00	50 mL	50 mL	U111516.D	Liquid	Y	NA
17	BLANK	SAMP	11-15-2021 07:47 pm	1.00	50 mL	50 mL	U111517.D	Liquid	Y	NA
18	VBLKW-211115	MBLK	11-15-2021 08:10 pm	1.00	50 mL	50 mL	U111518.D	Liquid	Y	NA
19	HS21110151-02	SAMP	11-15-2021 08:32 pm	1.00	50 mL	50 mL	U111519.D	Liquid	Y	NA
20	HS21110151-01	SAMP	11-15-2021 08:54 pm	1.00	50 mL	50 mL	U111520.D	Liquid	Y	NA
21	HS21110314-20	SAMP	11-15-2021 09:17 pm	1.00	50 mL	50 mL	U111521.D	Liquid	Y	NA
22	HS21110387-04	SAMP	11-15-2021 09:39 pm	1.00	50 mL	50 mL	U111522.D	Liquid	Y	NA
23	HS21110387-10	SAMP	11-15-2021 10:01 pm	1.00	50 mL	50 mL	U111523.D	Liquid	Y	NA
24	HS21110426-01	SAMP	11-15-2021 10:23 pm	1.00	50 mL	50 mL	U111524.D	Liquid	Y	NA
25	HS21110449-01	SAMP	11-15-2021 10:46 pm	1.00	50 mL	50 mL	U111525.D	Liquid	Y	NA
26	HS21110450-03	SAMP	11-15-2021 11:08 pm	1.00	50 mL	50 mL	U111526.D	Liquid	Y	NA
27	HS21110349-01	SAMP	11-15-2021 11:30 pm	1.00	50 mL	50 mL	U111527.D	Liquid	Y	NA
28	HS21110572-01	SAMP	11-15-2021 11:53 pm	1000.0	50 µL	50 mL	U111528.D	Liquid	Y	NA
29	HS21110572-01MS	MS	11-16-2021 12:15 am	1000.0	50 µL	50 mL	U111529.D	Liquid	Y	NA
30	HS21110572-01MSD	MSD	11-16-2021 12:37 am	1000.0	50 µL	50 mL	U111530.D	Liquid	Y	NA
31	VSTD050-END	CCV	11-16-2021 12:59 am	1.00	50 mL	50 mL	U111531.D	Liquid	Y	NA
32	HS21110572-01	SAMP	11-16-2021 01:22 am	100.0(	500 µL	50 mL	U111532.D	Liquid	Y	NA
33	BFB	TUNE	11-16-2021 01:44 am	1.00	50 mL	50 mL	V111501.D	Liquid	Y	NA
34	VSTD050	CCV	11-16-2021 02:06 am	1.00	50 mL	50 mL	V111502.D	Liquid	Y	NA
35	VSTD050	CCV	11-16-2021 02:28 am	1.00	50 mL	50 mL	V111503.D	Liquid	Y	NA
36	CCB	SAMP	11-16-2021 02:51 am	1.00	50 mL	50 mL	V111504.D	Liquid	Y	NA
37	VLCSW-211115	LCS	11-16-2021 03:13 am	1.00	50 mL	50 mL	V111505.D	Liquid	Y	NA
38	BLANK	SAMP	11-16-2021 03:35 am	1.00	50 mL	50 mL	V111506.D	Liquid	Y	NA
39	VBLKW-211115	MBLK	11-16-2021 03:57 am	50.00	1 mL	50 mL	V111507.D	Liquid	Y	NA
40	HS21110426-02	SAMP	11-16-2021 04:20 am	5000.0	10 µL	50 mL	V111508.D	Liquid	Y	NA
41	HS21110426-02	SAMP	11-16-2021 04:42 am	500.0(	100 µL	50 mL	V111509.D	Liquid	Y	N

MSVOA09 -Logbook

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
42	HS21110426-02MS	MS	11-16-2021 05:04 am	500.0(	100 µL	50 mL	V111510.D	Liquid	Y	NA
43	HS21110426-02MSD	MSD	11-16-2021 05:26 am	500.0(	100 µL	50 mL	V111511.D	Liquid	Y	NA
44	BLANK	SAMP	11-16-2021 05:49 am	1.00	50 mL	50 mL	V111512.D	Liquid	Y	NA
45	HS21110426-03	SAMP	11-16-2021 06:11 am	500.0(	100 µL	50 mL	V111513.D	Liquid	Y	NA
46	HS21110426-03	SAMP	11-16-2021 06:33 am	5000.0	10 µL	50 mL	V111514.D	Liquid	Y	NA
47	HS21110426-04	SAMP	11-16-2021 06:56 am	500.0(	100 µL	50 mL	V111515.D	Liquid	Y	NA
48	HS21110426-04	SAMP	11-16-2021 07:18 am	5000.0	10 µL	50 mL	V111516.D	Liquid	Y	NA
49	HS21110449-04	SAMP	11-16-2021 07:40 am	50.00	1 mL	50 mL	V111517.D	Liquid	Y	NA
50	HS21110449-04	SAMP	11-16-2021 08:03 am	500.0(	100 µL	50 mL	V111518.D	Liquid	Y	NA
51	HS21110450-01	SAMP	11-16-2021 08:25 am	250.0(	200 µL	50 mL	V111519.D	Liquid	Y	NA
52	HS21110450-01	SAMP	11-16-2021 08:47 am	2500.0	20 µL	50 mL	V111520.D	Liquid	Y	NA
53	HS21110450-02	SAMP	11-16-2021 09:10 am	1000.0	50 µL	50 mL	V111521.D	Liquid	Y	NA
54	HS21110450-02	SAMP	11-16-2021 09:32 am	10000.(	5 µL	50 mL	V111522.D	Liquid	Y	NA
55	HS21110450-08	SAMP	11-16-2021 09:54 am	500.0(	100 µL	50 mL	V111523.D	Liquid	Y	NA
56	HS21110450-08	SAMP	11-16-2021 10:17 am	5000.0	10 µL	50 mL	V111524.D	Liquid	Y	NA
57	HS21110450-09	SAMP	11-16-2021 10:39 am	2000.0	25 µL	50 mL	V111525.D	Liquid	Y	NA
58	HS21110450-09	SAMP	11-16-2021 11:01 am	20000.(	2.5 µL	50 mL	V111526.D	Liquid	Y	NA
59	HS21110450-10	SAMP	11-16-2021 11:24 am	500.0(	100 µL	50 mL	V111527.D	Liquid	Y	NA
60	HS21110450-10	SAMP	11-16-2021 11:46 am	5000.0	10 µL	50 mL	V111528.D	Liquid	Y	NA
61	BLANK	SAMP	11-16-2021 12:08 pm	1.00	50 mL	50 mL	V111529.D	Liquid	Y	NA
62	CCV-END	CCV	11-16-2021 12:31 pm	1.00	50 mL	50 mL	V111530.D	Liquid	Y	NA
63	BLANK	SAMP	11-16-2021 12:53 pm	1.00	50 mL	50 mL	V111531.D	Liquid	Y	NA

FORM 3
WATER VOLATILE METHOD SPIKE RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120243

Matrix Spike - Sample No.: ICV

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
cis-1,3-Dichloropropene	50.00	47.99	96	80-120
trans-1,3-Dichloroprope	50.00	47.48	95	80-120
1,3-Dichlorobenzene	50.00	48.12	96	80-120
2,2-Dichloropropane	50.00	52.44	105	80-120
1,1-Dichloropropene	50.00	49.02	98	80-120
Dibromomethane	50.00	51.27	102	80-120
1,2-Dibromoethane	50.00	52.96	106	80-120
trans-1,2-Dichloroethen	50.00	48.32	97	80-120
1,1,1,2-Tetrachloroetha	50.00	48.79	98	80-120
1,1,1-Trichloroethane	50.00	51.58	103	80-120
1,1,2,2-Tetrachloroetha	50.00	50.33	101	80-120
1,1,2-Trichloroethane	50.00	50.67	101	80-120
1,1-Dichloroethane	50.00	47.76	96	80-120
1,1-Dichloroethene	50.00	48.22	96	80-120
Trichloroethene	50.00	51.11	102	80-120
1,2,3-Trichlorobenzene	50.00	49.28	98	80-120
Trichlorofluoromethane	50.00	47.23	94	80-120
1,2,4-Trichlorobenzene	50.00	50.49	101	80-120
1,2,4-Trimethylbenzene	50.00	49.44	99	80-120
Tetrachloroethene	50.00	46.55	93	80-120
1,2-Dichlorobenzene	50.00	49.10	98	80-120
1,2-Dichloroethane	50.00	49.72	99	80-120
1,2-Dichloropropane	50.00	50.65	101	80-120
1,3,5-Trimethylbenzene	50.00	48.38	97	80-120
1,3-Dichloropropane	50.00	49.94	100	80-120
1,4-Dichlorobenzene	50.00	48.60	97	80-120
Toluene	50.00	48.78	98	80-120
2-Butanone	100.00	98.76	99	80-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

_____

FORM III VOA

FORM 3
WATER VOLATILE METHOD SPIKE RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120243

Matrix Spike - Sample No.: ICV

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
2-Chlorotoluene	50.00	48.19	96	80-120
2-Hexanone	100.00	112.63	113	80-120
4-Chlorotoluene	50.00	48.96	98	80-120
tert-Butylbenzene	50.00	47.53	95	80-120
4-Methyl-2-Pentanone	100.00	103.85	104	80-120
Acetone	100.00	102.63	103	80-120
Benzene	50.00	50.06	100	80-120
Bromobenzene	50.00	51.00	102	80-120
Bromochloromethane	50.00	52.43	105	80-120
Bromodichloromethane	50.00	47.32	95	80-120
Bromoform	50.00	48.31	97	80-120
Bromomethane	50.00	59.05	118	80-120
Carbon Disulfide	100.00	100.49	100	80-120
Carbon Tetrachloride	50.00	45.44	91	80-120
Chlorobenzene	50.00	48.60	97	80-120
Chloroethane	50.00	44.89	90	80-120
Chloroform	50.00	50.22	100	80-120
Chloromethane	50.00	50.93	102	80-120
cis-1,2-Dichloroethene	50.00	49.81	100	80-120
Dibromochloromethane	50.00	47.90	96	80-120
Dichlorodifluoromethane	50.00	47.62	95	80-120
Ethylbenzene	50.00	49.18	98	80-120
Hexachlorobutadiene	50.00	48.57	97	80-120
Isopropylbenzene	50.00	48.13	96	80-120
m,p-Xylenes	100.00	100.37	100	80-120
Methylene Chloride	50.00	45.36	91	80-120
n-Butylbenzene	50.00	46.76	94	80-120
n-Propylbenzene	50.00	48.47	97	80-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

_____

FORM III VOA

FORM 3
WATER VOLATILE METHOD SPIKE RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120243

Matrix Spike - Sample No.: ICV

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
Naphthalene	50.00	50.21	100	80-120
o-Xylene	50.00	49.55	99	80-120
sec-Butylbenzene	50.00	47.04	94	80-120
Styrene	50.00	51.92	104	80-120
Vinyl Chloride	50.00	47.53	95	80-120
1,2,3-Trichloropropane	50.00	52.94	106	80-120
p-Isopropyltoluene	50.00	48.68	97	80-120
1,2-Dibromo-3-Chloropro	50.00	47.07	94	80-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

_____

FORM III VOA

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120243

Lab File ID: U111501 BFB Injection Date: 11/15/21

Instrument ID: VOA9 BFB Injection Time: 1330

GC Column: DB624 ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	15.6
75	30.0 - 60.0% of mass 95	47.4
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.7
173	Less than 2.0% of mass 174	0.4 (0.5)1
174	Greater than 50.0% of mass 95	79.5
175	5.0 - 9.0% of mass 174	6.2 (7.8)1
176	95.0 - 101.0% of mass 174	76.3 (96.0)1
177	5.0 - 9.0% of mass 176	4.9 (6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD000.25	VSTD000.25	U111502	11/15/21	1352
02	VSTD000.5	VSTD000.5	U111503	11/15/21	1436
03	VSTD001	VSTD001	U111504	11/15/21	1458
04	VSTD002	VSTD002	U111505	11/15/21	1520
05	VSTD005	VSTD005	U111506	11/15/21	1543
06	VSTD020	VSTD020	U111507	11/15/21	1605
07	VSTD050	VSTD050	U111508	11/15/21	1627
08	VSTD100	VSTD100	U111509	11/15/21	1649
09	VSTD150	VSTD150	U111510	11/15/21	1711
10	VSTD200	VSTD200	U111511	11/15/21	1734
11	ICV	ICV	U111513	11/15/21	1818
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120243

Instrument ID: VOA9 Calibration Date(s): 11/15/21 11/15/21

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1352 1734

LAB FILE ID: RF0.25: U111502 RF0.5: U111503 RF1: U111504
RF2: U111505 RF5: U111506 RF20: U111507

COMPOUND	RF0.25	RF0.5	RF1	RF2	RF5	RF20
cis-1,3-Dichloropropene		1095	2819	5706	15790	82868
trans-1,3-Dichloropropene		735	2070	4426	12599	66354
1,3-Dichlorobenzene		1.290	1.572	1.451	1.481	1.451
2,2-Dichloropropane		0.422	0.495	0.447	0.456	0.479
1,1-Dichloropropene		0.325	0.432	0.408	0.428	0.416
Dibromomethane		0.196	0.220	0.211	0.221	0.222
1,2-Dibromoethane		0.270	0.351	0.339	0.374	0.390
trans-1,2-Dichloroethene		0.513	0.537	0.503	0.507	0.502
1,1,1,2-Tetrachloroethane		803	2215	4304	11768	54596
1,1,1-Trichloroethane		0.545	0.680	0.652	0.673	0.733
1,1,2,2-Tetrachloroethane		0.852	1.090	1.126	1.105	1.113
1,1,2-Trichloroethane		0.253	0.314	0.290	0.320	0.306
1,1-Dichloroethane		0.768	0.957	0.950	0.950	0.919
1,1-Dichloroethene		0.374	0.476	0.474	0.450	0.445
Trichloroethene		0.274	0.339	0.332	0.330	0.324
1,2,3-Trichlorobenzene		0.686	0.955	0.932	0.895	0.895
Trichlorofluoromethane		0.648	0.893	0.820	0.805	0.816
1,2,4-Trichlorobenzene		0.792	0.915	0.919	0.902	0.905
1,2,4-Trimethylbenzene		1.982	2.556	2.475	2.550	2.640
Tetrachloroethene		0.265	0.313	0.289	0.285	0.276
1,2-Dichlorobenzene		1.126	1.515	1.479	1.481	1.450
1,2-Dichloroethane		0.373	0.512	0.448	0.489	0.468
1,2-Dichloropropane		0.247	0.330	0.319	0.335	0.328
1,3,5-Trimethylbenzene		2.126	2.512	2.442	2.481	2.526
1,3-Dichloropropane		0.503	0.662	0.628	0.698	0.664
1,4-Dichlorobenzene		1.237	1.642	1.503	1.560	1.495
Toluene		1.376	1.627	1.485	1.566	1.540
2-Butanone		0.290	0.263	0.236	0.263	0.271
2-Chlorotoluene		1.790	2.279	2.177	2.289	2.209
2-Hexanone		0.166	0.196	0.235	0.251	0.265
4-Chlorotoluene		2.122	2.544	2.497	2.655	2.594
tert-Butylbenzene		1.825	2.105	2.018	2.067	2.103
4-Methyl-2-Pentanone		0.308	0.363	0.341	0.357	0.380
Acetone		3031	4060	7509	12006	42250
Benzene		1.101	1.407	1.232	1.307	1.289
Bromobenzene		0.573	0.826	0.752	0.814	0.813
Bromochloromethane		0.222	0.288	0.297	0.301	0.309
Bromodichloromethane		1201	3055	5486	15337	68589
Bromoform		450	1090	2438	6778	32750
Bromomethane		935	2151	3804	9672	34362
Carbon Disulfide		1.032	1.308	1.211	1.225	1.245
Carbon Tetrachloride		1045	3053	5276	13108	61682
Chlorobenzene		0.917	1.063	0.976	1.013	0.985
Chloroethane		0.501	0.439	0.384	0.426	0.407

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS2112024

Instrument ID: VOA9 Calibration Date(s): 11/15/21 11/15/21

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1352 1734

LAB FILE ID: RF0.25: U111502 RF0.5: U111503 RF1: U111504
RF2: U111505 RF5: U111506 RF20: U111507

COMPOUND	RF0.25	RF0.5	RF1	RF2	RF5	RF20
Chloroform		0.758	1.012	0.944	1.039	1.013
Chloromethane		1429	3019	5164	13015	52032
cis-1,2-Dichloroethene		0.516	0.640	0.636	0.641	0.629
Dibromochloromethane		630	2071	3879	11164	55171
Dichlorodifluoromethane		1420	3384	6494	15309	63286
Ethylbenzene		0.405	0.512	0.490	0.502	0.492
Hexachlorobutadiene		0.281	0.322	0.303	0.305	0.327
Isopropylbenzene		1.180	1.525	1.469	1.488	1.497
m,p-Xylenes		0.471	0.620	0.596	0.633	0.626
Methylene Chloride		0.708	0.680	0.636	0.610	0.568
n-Butylbenzene		2.000	2.140	2.132	2.120	2.199
n-Propylbenzene		2.771	3.584	3.352	3.462	3.491
Naphthalene		2.420	2.700	2.813	2.633	2.728
o-Xylene		0.498	0.642	0.566	0.626	0.609
sec-Butylbenzene		2.300	2.816	2.739	2.762	2.809
Styrene		0.768	0.988	0.986	1.069	1.088
Vinyl Chloride		0.550	0.636	0.612	0.612	0.606
1,2,3-Trichloropropane		0.831	0.900	0.952	1.060	1.059
p-Isopropyltoluene		1.920	2.338	2.401	2.413	2.500
1,2-Dibromo-3-Chloropropane		40	360	886	2022	11576
1,2-Dichloroethane-d4		1948	3378	7830	19646	71255
Dibromofluoromethane		1516	2474	5867	15313	59371
Toluene-d8		1.503	1.155	1.348	1.440	1.329
4-Bromofluorobenzene		3705	6215	11258	23787	86314

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS2112024

Instrument ID: VOA9 Calibration Date(s): 11/15/21 11/15/21

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1352 1734

LAB FILE ID: RF50: U111508 RF100: U111509 RF150: U111510
RF200: U111511

COMPOUND	RF50	RF100	RF150	RF200
cis-1,3-Dichloropropene	238784	512945	784849	1067583
trans-1,3-Dichloropropene	203307	440168	679057	919660
1,3-Dichlorobenzene	1.439	1.434	1.426	1.415
2,2-Dichloropropane	0.528	0.560	0.564	0.580
1,1-Dichloropropene	0.431	0.426	0.417	0.411
Dibromomethane	0.216	0.219	0.212	0.212
1,2-Dibromoethane	0.382	0.383	0.367	0.364
trans-1,2-Dichloroethene	0.511	0.496	0.476	0.480
1,1,1,2-Tetrachloroethane	145929	305424	468015	631462
1,1,1-Trichloroethane	0.782	0.809	0.794	0.809
1,1,2,2-Tetrachloroethane	1.071	1.071	1.033	1.010
1,1,2-Trichloroethane	0.301	0.300	0.283	0.286
1,1-Dichloroethane	0.900	0.880	0.834	0.836
1,1-Dichloroethene	0.464	0.455	0.437	0.436
Trichloroethene	0.340	0.338	0.330	0.332
1,2,3-Trichlorobenzene	0.909	0.924	0.935	0.927
Trichlorofluoromethane	0.853	0.829	0.796	0.798
1,2,4-Trichlorobenzene	0.952	0.966	0.968	0.963
1,2,4-Trimethylbenzene	2.652	2.626	2.566	2.513
Tetrachloroethene	0.282	0.278	0.274	0.274
1,2-Dichlorobenzene	1.440	1.428	1.392	1.379
1,2-Dichloroethane	0.453	0.454	0.433	0.429
1,2-Dichloropropane	0.323	0.325	0.313	0.312
1,3,5-Trimethylbenzene	2.546	2.544	2.499	2.449
1,3-Dichloropropane	0.644	0.638	0.608	0.605
1,4-Dichlorobenzene	1.494	1.494	1.456	1.454
Toluene	1.517	1.490	1.436	1.426
2-Butanone	0.264	0.266	0.251	0.249
2-Chlorotoluene	2.201	2.187	2.135	2.110
2-Hexanone	0.267	0.243	0.258	0.254
4-Chlorotoluene	2.554	2.559	2.481	2.450
tert-Butylbenzene	2.152	2.160	2.127	2.093
4-Methyl-2-Pentanone	0.382	0.382	0.366	0.361
Acetone	102765	199248	287306	371722
Benzene	1.291	1.284	1.238	1.229
Bromobenzene	0.800	0.812	0.797	0.792
Bromochloromethane	0.294	0.285	0.271	0.271
Bromodichloromethane	187745	392803	600907	813877
Bromoform	96626	216725	341423	468271
Bromomethane	83889	170081		
Carbon Disulfide	1.314	1.299	1.254	1.248
Carbon Tetrachloride	182502	382517	595268	799370
Chlorobenzene	0.973	0.968	0.938	0.940
Chloroethane	0.400	0.401	0.392	0.374

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS2112024

Instrument ID: VOA9 Calibration Date(s): 11/15/21 11/15/21

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1352 1734

LAB FILE ID: RF50: U111508 RF100: U111509 RF150: U111510
RF200: U111511

COMPOUND	RF50	RF100	RF150	RF200
Chloroform	0.999	0.993	0.952	0.959
Chloromethane	145589	274951	431092	557544
cis-1,2-Dichloroethene	0.628	0.617	0.592	0.600
Dibromochloromethane	155960	334001	509745	696655
Dichlorodifluoromethane	172970	337382	508351	667949
Ethylbenzene	0.508	0.501	0.492	0.488
Hexachlorobutadiene	0.362	0.382	0.394	0.384
Isopropylbenzene	1.551	1.531	1.488	1.492
m,p-Xylenes	0.633	0.629	0.609	0.608
Methylene Chloride	0.547	0.538	0.508	0.507
n-Butylbenzene	2.309	2.316	2.259	2.188
n-Propylbenzene	3.531	3.532	3.463	3.377
Naphthalene	2.851	2.911	2.898	2.839
o-Xylene	0.625	0.613	0.596	0.598
sec-Butylbenzene	2.948	2.958	2.930	2.848
Styrene	1.109	1.100	1.059	1.059
Vinyl Chloride	0.626	0.617	0.592	0.589
1,2,3-Trichloropropane	1.090	1.136	1.142	1.130
p-Isopropyltoluene	2.604	2.636	2.591	2.527
1,2-Dibromo-3-Chloropropane	34570	77043	120988	163858
1,2-Dichloroethane-d4	174378	347770	519537	675186
Dibromofluoromethane	146958	294099	451793	584069
Toluene-d8	1.272	1.254	1.230	1.180
4-Bromofluorobenzene	212217	425707	646932	842976

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS2112024

Instrument ID: VOA9 Calibration Date(s): 11/15/21 11/15/21

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1352 1734

COMPOUND	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2	MAX %RSD OR R^2
cis-1,3-Dichloropropene	LINR	3.487e-002	1.83134486		0.9996162	0.9900000
trans-1,3-Dichloropropene	LINR	4.225e-002	2.11997871		0.9994871	0.9900000
1,3-Dichlorobenzene	AVRG		1.44005923		5.076	20.000
2,2-Dichloropropane	AVRG		0.50343025		11.334	20.000
1,1-Dichloropropene	AVRG		0.41059421		8.131	20.000
Dibromomethane	AVRG		0.21458337		3.716	20.000
1,2-Dibromoethane	AVRG		0.35789930		10.224	20.000
trans-1,2-Dichloroethene	AVRG		0.50286983		3.614	20.000
1,1,1,2-Tetrachloroethane	LINR	1.65e-002	2.83730731		0.9998992	0.9900000
1,1,1-Trichloroethane	AVRG		0.71976811		12.476	20.000
1,1,2,2-Tetrachloroethane	AVRG		1.05239113		7.961	20.000
1,1,2-Trichloroethane	AVRG		0.29462567		6.763	20.000
1,1-Dichloroethane	AVRG		0.88828730		7.312	20.000
1,1-Dichloroethene	AVRG		0.44578296		6.832	20.000
Trichloroethene	AVRG		0.32664734		6.189	20.000
1,2,3-Trichlorobenzene	AVRG		0.89541206		9.048	20.000
Trichlorofluoromethane	AVRG		0.80634694		8.275	20.000
1,2,4-Trichlorobenzene	AVRG		0.92028728		6.006	20.000
1,2,4-Trimethylbenzene	AVRG		2.50663317		8.196	20.000
Tetrachloroethene	AVRG		0.28198562		4.841	20.000
1,2-Dichlorobenzene	AVRG		1.40999862		8.162	20.000
1,2-Dichloroethane	AVRG		0.45105608		8.724	20.000
1,2-Dichloropropane	AVRG		0.31462191		8.382	20.000
1,3,5-Trimethylbenzene	AVRG		2.45827404		5.294	20.000
1,3-Dichloropropane	AVRG		0.62780551		8.738	20.000
1,4-Dichlorobenzene	AVRG		1.48179325		7.318	20.000
Toluene	AVRG		1.49582459		5.150	20.000
2-Butanone	AVRG		0.26145057		5.850	20.000
2-Chlorotoluene	AVRG		2.15306767		6.882	20.000
2-Hexanone	AVRG		0.23735195		14.451	20.000
4-Chlorotoluene	AVRG		2.49516740		6.122	20.000
tert-Butylbenzene	AVRG		2.07221419		4.925	20.000
4-Methyl-2-Pentanone	AVRG		0.36009677		6.532	20.000
Acetone	LINR	-0.1327078	6.11155985		0.9980573	0.9900000
Benzene	AVRG		1.26430019		6.460	20.000
Bromobenzene	AVRG		0.77538721		10.169	20.000
Bromochloromethane	AVRG		0.28203061		9.198	20.000
Bromodichloromethane	LINR	2.074e-002	2.40666475		0.9998321	0.9900000
Bromoform	2ORDR	2.858e-002	4.22513840	-0.4148270	0.9996537	0.9900000
Bromomethane	LINR	-1.03e-002	3.27907024		0.9997756	0.9900000
Carbon Disulfide	AVRG		1.23725488		6.898	20.000
Carbon Tetrachloride	LINR	3.012e-002	2.44047659		0.9997197	0.9900000
Chlorobenzene	AVRG		0.97474921		4.490	20.000
Chloroethane	AVRG		0.41373377		9.243	20.000

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS2112024

Instrument ID: VOA9 Calibration Date(s): 11/15/21 11/15/21

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1352 1734

COMPOUND	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2	MAX %RSD OR R^2
Chloroform	AVRG		0.96311174		8.652	20.000
Chloromethane	LINR	-1.17e-002	2.03080489		0.9996091	0.9900000
cis-1,2-Dichloroethene	AVRG		0.61087669		6.500	20.000
Dibromochloromethane	LINR	2.999e-002	2.57567744		0.9996307	0.9900000
Dichlorodifluoromethane	LINR	-1.42e-002	1.69951750		0.9995681	0.9900000
Ethylbenzene	AVRG		0.48784043		6.585	20.000
Hexachlorobutadiene	AVRG		0.34013347		12.120	20.000
Isopropylbenzene	AVRG		1.46892443		7.590	20.000
m,p-Xylenes	AVRG		0.60276579		8.439	20.000
Methylene Chloride	AVRG		0.58922292		12.471	20.000
n-Butylbenzene	AVRG		2.18473949		4.610	20.000
n-Propylbenzene	AVRG		3.39600934		7.236	20.000
Naphthalene	AVRG		2.75488767		5.678	20.000
o-Xylene	AVRG		0.59701249		7.174	20.000
sec-Butylbenzene	AVRG		2.79010830		7.172	20.000
Styrene	AVRG		1.02517757		10.329	20.000
Vinyl Chloride	AVRG		0.60470714		4.166	20.000
1,2,3-Trichloropropane	AVRG		1.03329000		10.902	20.000
p-Isopropyltoluene	AVRG		2.43660884		8.975	20.000
1,2-Dibromo-3-Chloropropane	LINR	4.869e-002	5.46522257		0.9992261	0.9900000
1,2-Dichloroethane-d4	LINR	-3.e-002	1.67917269		0.9992844	0.9900000
Dibromofluoromethane	LINR	-1.72e-002	1.93811970		0.9996464	0.9900000
Toluene-d8	AVRG		1.30132427		8.896	20.000
4-Bromofluorobenzene	LINR	-2.69e-002	2.11455518		0.9996403	0.9900000

FORM VI VOA

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111501.D

Date : 15-NOV-2021 13:30

Client ID: BFB

Instrument: VOA9.i

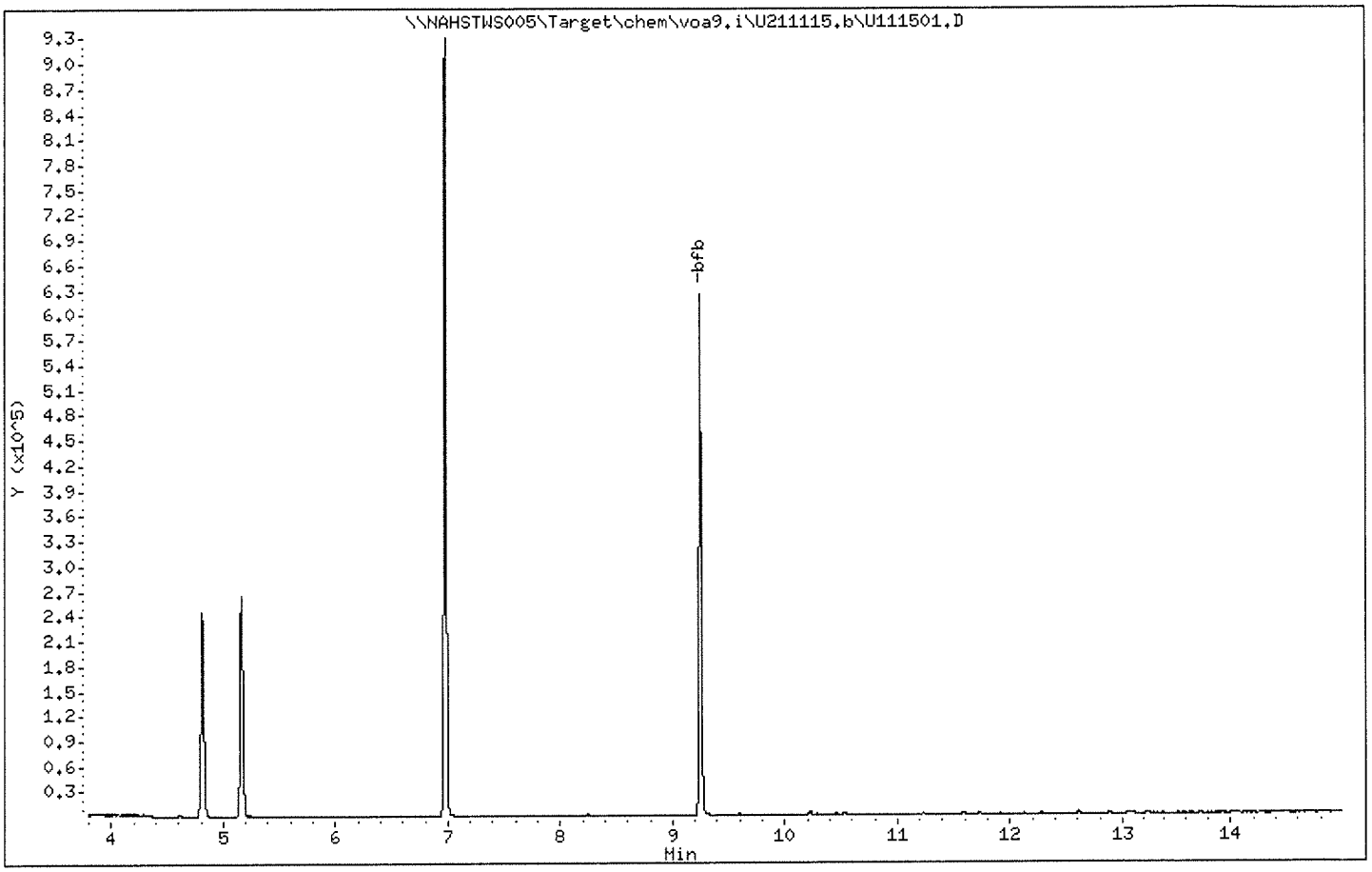
Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111501.D Page 2

Date : 15-NOV-2021 13:30

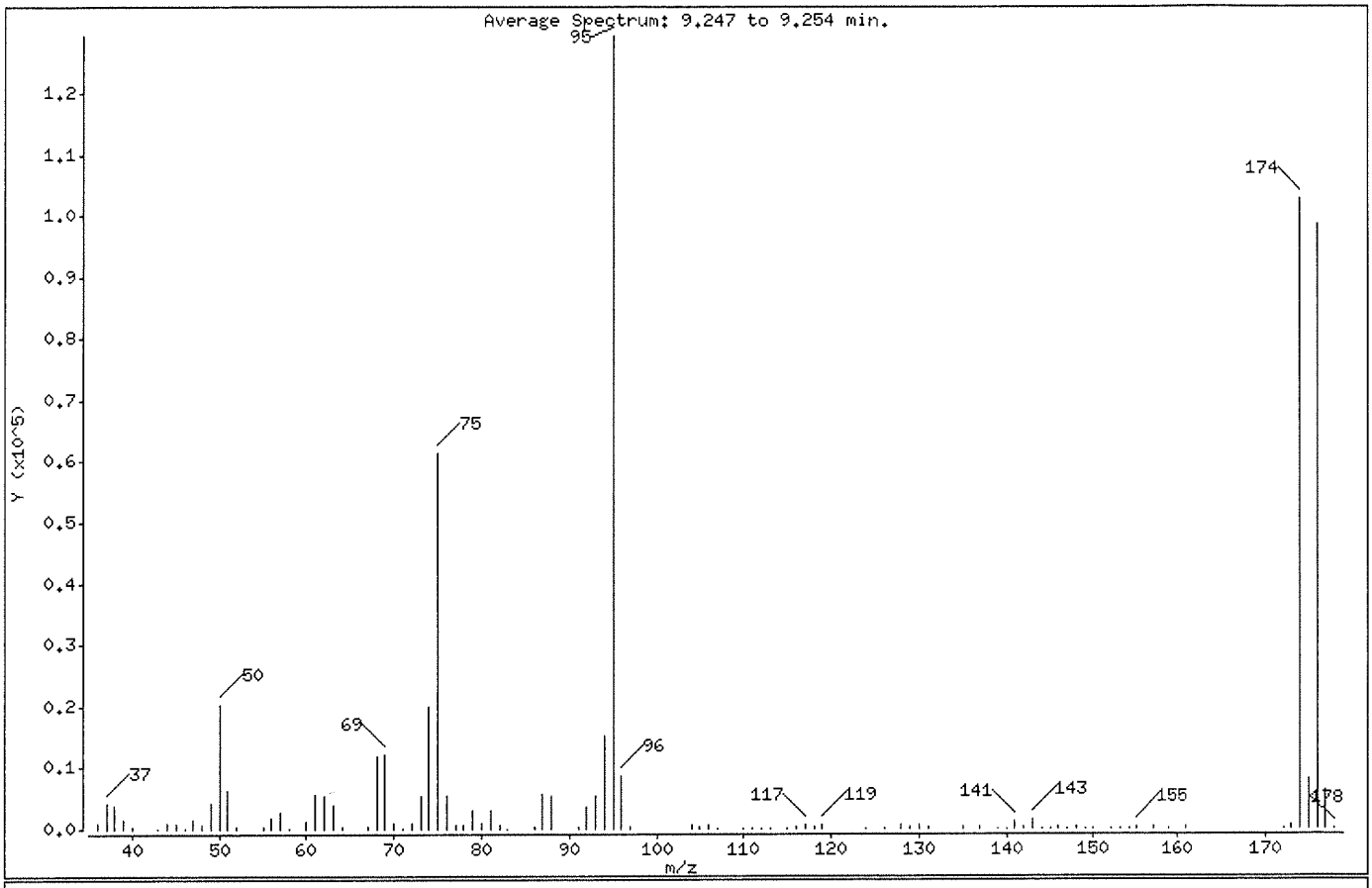
Client ID: BFB Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0 Operator: PC

Column phase: DB624 Column diameter: 0.25

1 bfb



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
95	Base Peak, 100% relative abundance	100.00
50	15.00 - 40.00% of mass 95	15.55
75	30.00 - 60.00% of mass 95	47.37
96	5.00 - 9.00% of mass 95	6.69
173	Less than 2.00% of mass 174	0.38 (0.48)
174	Greater than 50.00% of mass 95	79.51
175	5.00 - 9.00% of mass 174	6.24 (7.85)
176	95.00 - 101.00% of mass 174	76.33 (96.00)
177	5.00 - 9.00% of mass 176	4.91 (6.44)

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111501.D

Date : 15-NOV-2021 13:30

Client ID: BFB

Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25

Data File: U111501.D
Spectrum: Average Spectrum: 9.247 to 9.254 min.
Location of Maximum: 95.00
Number of points: 98

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	941	68.00	11785	97.00	266	142.00	180
37.00	4243	69.00	12077	104.00	559	143.00	1387
38.00	3806	70.00	924	105.00	203	144.00	63
39.00	1546	71.00	37	106.00	485	145.00	121
40.00	316	72.00	753	107.00	107	146.00	201
43.00	109	73.00	5407	110.00	72	147.00	87
44.00	891	74.00	19864	111.00	23	148.00	284
45.00	980	75.00	61208	112.00	76	149.00	97
46.00	50	76.00	5285	113.00	60	150.00	102
47.00	1494	77.00	600	115.00	127	152.00	45
48.00	586	78.00	574	116.00	421	153.00	86
49.00	4230	79.00	3048	117.00	726	154.00	90
50.00	20096	80.00	898	118.00	405	155.00	302
51.00	6128	81.00	2855	119.00	658	157.00	257
52.00	336	82.00	628	124.00	99	159.00	130
55.00	350	83.00	36	126.00	83	161.00	171
56.00	1670	86.00	153	128.00	509	172.00	31
57.00	2712	87.00	5639	129.00	222	173.00	488
58.00	119	88.00	5327	130.00	489	174.00	102728
60.00	1096	91.00	437	131.00	196	175.00	8062
61.00	5540	92.00	3482	135.00	192	176.00	98616
62.00	5258	93.00	5420	137.00	195	177.00	6348
63.00	3781	94.00	15052	139.00	50	178.00	148
64.00	320	95.00	129208	140.00	92		
67.00	367	96.00	8638	141.00	1285		

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111502.D Page 1
Report Date: 20-Dec-2021 15:39

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111502.D
Lab Smp Id: VSTD000.25 Client Smp ID: VSTD000.25
Inj Date : 15-NOV-2021 13:52
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD000.25;VSTD000.25;1;1;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211115.b\8260C.m
Meth Date : 20-Dec-2021 15:39 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 17:34 Cal File: U111511.D
Als bottle: 2 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

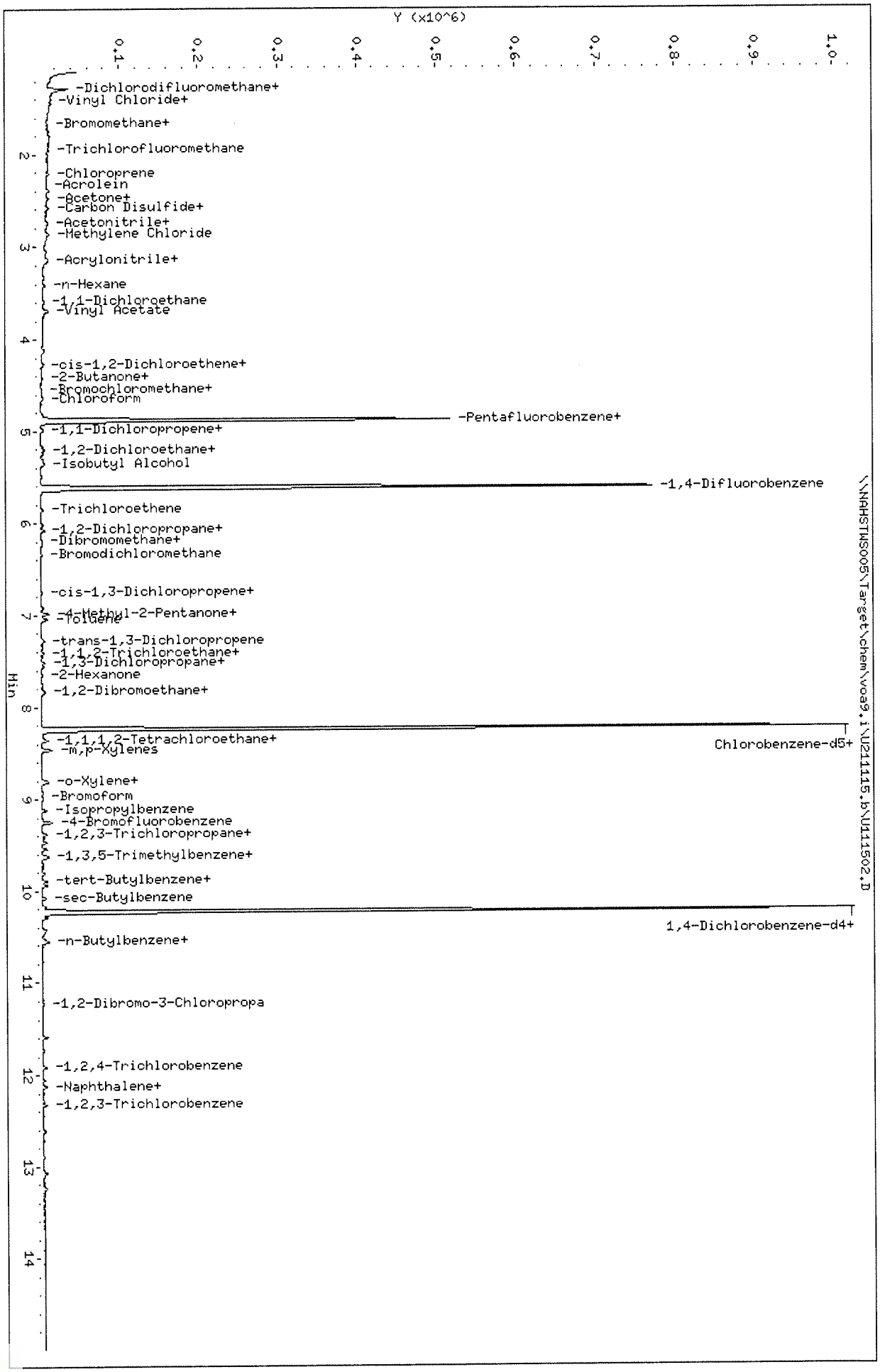
Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.883	4.883	(1.000)	322381	50.0000	
* 36 1,4-Difluorobenzene	114	5.617	5.617	(1.000)	561409	50.0000	
* 47 Chlorobenzene-d5	117	8.242	8.242	(1.000)	505816	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	250052	50.0000	
$ 30 Dibromofluoromethane	113	4.823	4.823	(0.988)	1512	0.25000	(a)
$ 35 1,2-Dichloroethane-d4	65	5.168	5.168	(1.058)	1798	0.25000	(Ta)
$ 48 Toluene-d8	98	6.982	6.982	(0.847)	5872	0.25000	0.44(a)
$ 69 4-Bromofluorobenzene	95	9.250	9.250	(1.122)	4568	0.25000	(a)
60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	632	0.25000	1.00(a)
31 1,1,1-Trichloroethane	97	4.815	4.815	(0.986)	1167	0.25000	0.25(a)
68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	1258	0.25000	0.23(aM)
53 1,1,2-Trichloroethane	83	7.409	7.409	(0.899)	870	0.25000	0.29(a)
22 1,1-Dichloroethane	63	3.589	3.589	(0.735)	1954	0.25000	0.34(aM)
11 1,1-Dichloroethene	96	2.394	2.394	(0.490)	913	0.25000	0.31(aM)
32 1,1-Dichloropropene	75	4.991	4.991	(0.889)	1396	0.25000	0.30(a)
93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	1206	0.25000	0.26(aM)
71 1,2,3-Trichloropropane	75	9.419	9.419	(0.921)	1328	0.25000	0.25(a)
90 1,2,4-Trichlorobenzene	180	11.911	11.911	(1.165)	1396	0.25000	0.30(aM)
79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	3727	0.25000	0.29(a)
89 1,2-Dibromo-3-Chloropropane	155	11.225	11.225	(1.098)	68	0.25000	2.50(aM)
57 1,2-Dibromoethane	107	7.844	7.844	(0.952)	944	0.25000	0.26(a)
88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	1995	0.25000	0.28(a)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.246	(0.934)	1530	0.25000	0.30(aM)
42	1,2-Dichloropropane	63	6.071	6.071	(1.081)	966	0.25000	0.27(a)
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	3805	0.25000	0.30(a)
83	1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	2005	0.25000	0.27(a)
54	1,3-Dichloropropane	76	7.555	7.555	(0.917)	2015	0.25000	0.31(a)
84	1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	2212	0.25000	0.29(a)
26	2,2-Dichloropropane	77	4.260	4.260	(0.873)	1106	0.25000	0.34(aM)
24	2-Butanone	43	4.350	4.350	(0.891)	1658	0.50000	0.98(aM)
76	2-Chlorotoluene	91	9.539	9.539	(0.933)	3378	0.25000	0.31(a)
52	2-Hexanone	43	7.649	7.649	(0.928)	1299	0.50000	0.54(TaH)
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	3484	0.25000	0.27(a)
82	p-Isopropyltoluene	119	10.202	10.202	(0.998)	3158	0.25000	0.25(a)
45	4-Methyl-2-Pentanone	43	6.914	6.914	(0.839)	2324	0.50000	0.63(a)
10	Acetone	43	2.476	2.476	(0.507)	2903	0.50000	(a)
37	Benzene	78	5.205	5.205	(0.927)	4360	0.25000	0.30(a)
74	Bromobenzene	156	9.377	9.377	(0.917)	1019	0.25000	0.26(a)
29	Bromochloromethane	128	4.542	4.542	(0.930)	627	0.25000	0.34(a)
39	Bromodichloromethane	83	6.341	6.341	(1.129)	1011	0.25000	1.25(aM)
66	Bromoform	173	8.972	8.972	(1.089)	374	0.25000	1.58(aM)
6	Bromomethane	94	1.663	1.663	(0.341)	802	0.25000	(a)
19	Carbon Disulfide	76	2.581	2.581	(0.529)	4854	0.50000	0.60(a)
34	Carbon Tetrachloride	117	4.980	4.980	(0.887)	989	0.25000	1.72(a)
59	Chlorobenzene	112	8.268	8.268	(1.003)	3108	0.25000	0.31(a)
7	Chloroethane	64	1.749	1.749	(0.358)	1007	0.25000	0.37(aM)
28	Chloroform	83	4.647	4.647	(0.952)	1934	0.25000	0.31(a)
3	Chloromethane	50	1.336	1.336	(0.274)	967	0.25000	(aM)
27	cis-1,2-Dichloroethene	96	4.272	4.272	(0.875)	1143	0.25000	0.29(a)
46	cis-1,3-Dichloropropene	75	6.750	6.750	(1.202)	1036	0.25000	1.91(aM)
55	Dibromochloromethane	129	7.750	7.750	(0.940)	615	0.25000	1.65(aM)
44	Dibromomethane	93	6.180	6.180	(1.100)	727	0.25000	0.30(a)
2	Dichlorodifluoromethane	85	1.198	1.198	(0.245)	1178	0.25000	(aM)
61	Ethylbenzene	106	8.361	8.361	(1.015)	1495	0.25000	0.30(a)
91	Hexachlorobutadiene	225	12.050	12.050	(1.179)	504	0.25000	0.29(aM)
67	Isopropylbenzene	105	9.115	9.115	(1.106)	4114	0.25000	0.27(a)
62	m,p-Xylenes	106	8.463	8.463	(1.027)	3523	0.50000	0.57(a)
17	Methylene Chloride	84	2.858	2.858	(0.585)	1637	0.25000	0.43(a)
87	n-Butylbenzene	91	10.547	10.547	(1.032)	3648	0.25000	0.33(a)
73	n-Propylbenzene	91	9.467	9.467	(0.926)	5107	0.25000	0.30(a)
92	Naphthalene	128	12.125	12.125	(1.186)	4226	0.25000	0.30(a)
63	o-Xylene	106	8.804	8.804	(1.068)	1735	0.25000	0.28(a)
81	sec-Butylbenzene	105	10.075	10.075	(0.985)	3944	0.25000	0.28(a)
64	Styrene	104	8.819	8.819	(1.070)	2661	0.25000	0.25(a)
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	2917	0.25000	0.28(a)
56	Tetrachloroethene	164	7.511	7.511	(0.911)	975	0.25000	0.34(a)
50	Toluene	91	7.038	7.038	(0.854)	4969	0.25000	0.32(a)
20	trans-1,2-Dichloroethene	96	3.128	3.128	(0.641)	992	0.25000	0.30(a)
51	trans-1,3-Dichloropropene	75	7.256	7.256	(1.292)	656	0.25000	2.23(aM)
38	Trichloroethene	130	5.850	5.850	(1.041)	1142	0.25000	0.31(a)
8	Trichlorofluoromethane	101	1.944	1.944	(0.398)	1441	0.25000	0.27(a)
5	Vinyl Chloride	62	1.411	1.411	(0.289)	1216	0.25000	0.31(a)

QC Flag Legend

T - Target compound detected outside RT window.
a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.



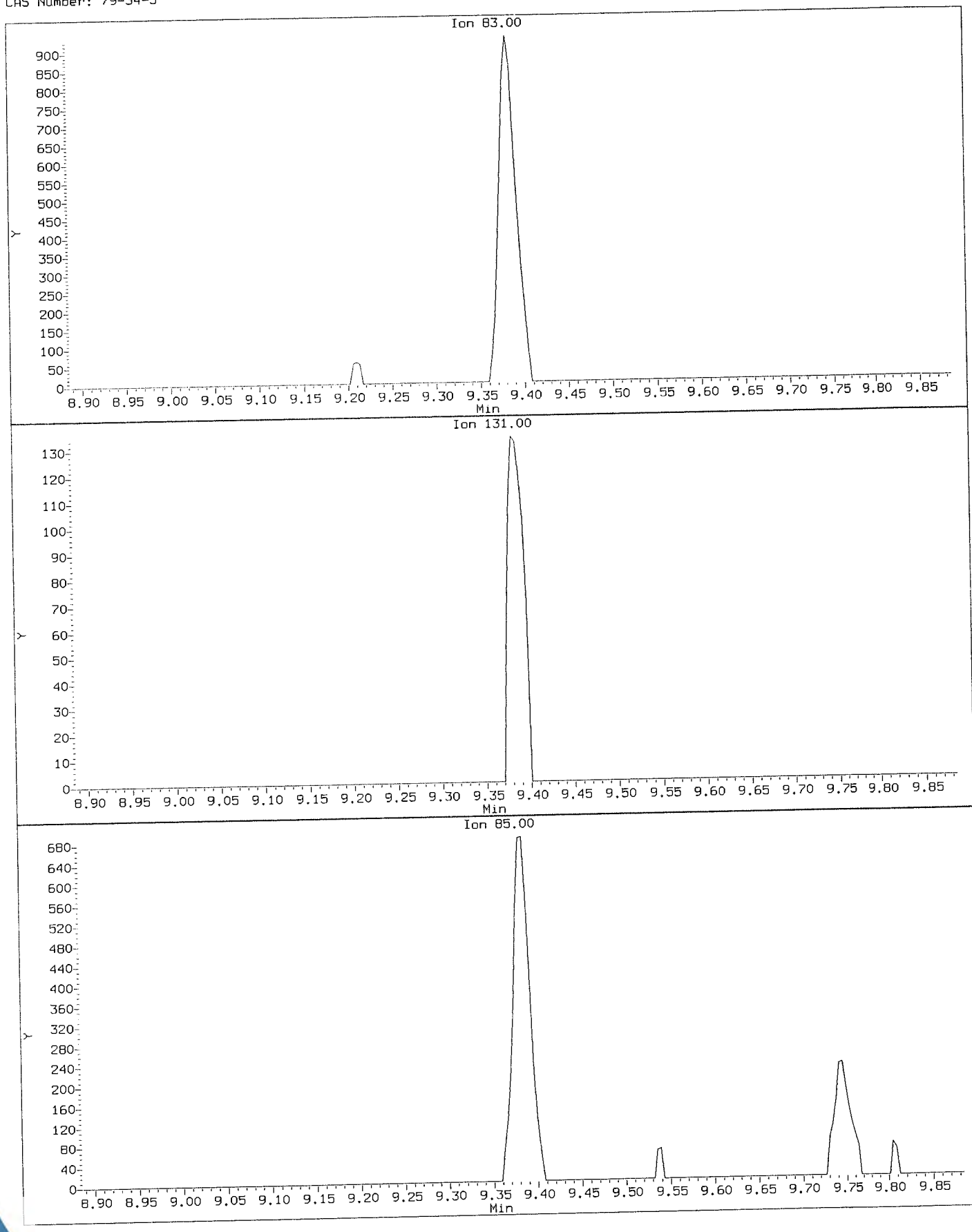
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Sample Info: VSTD000.25;VSTD000.25;1;1;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

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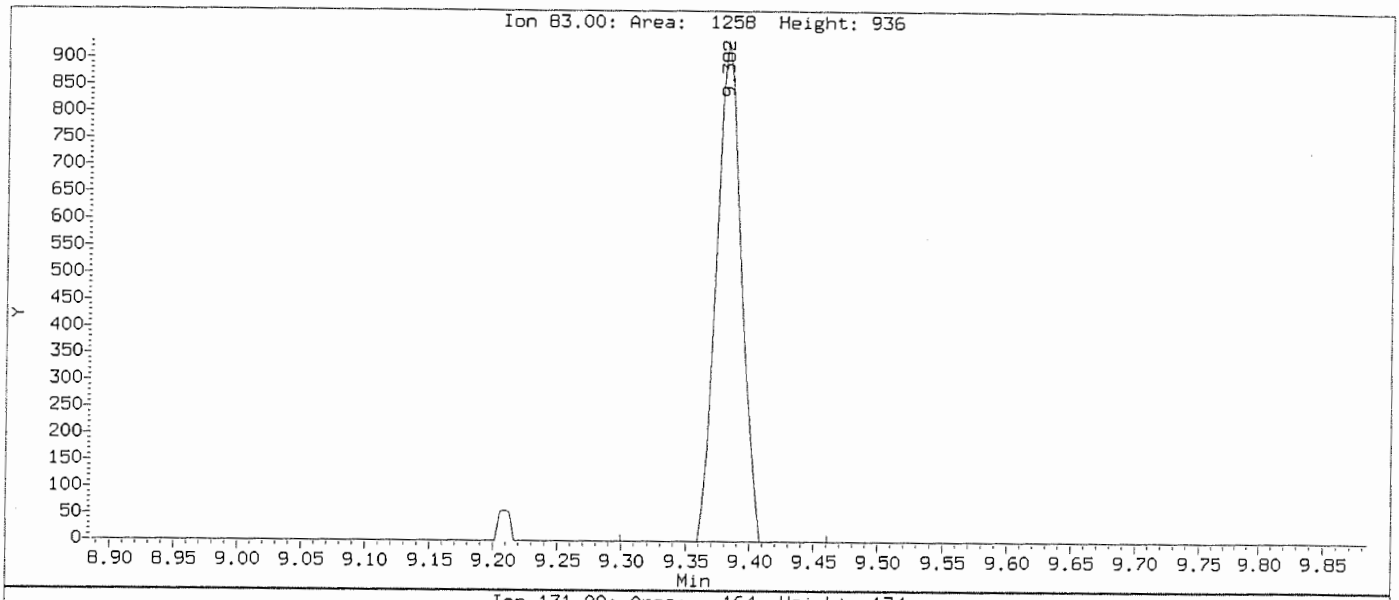
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Instrument: VOA9.i
Client Sample ID: VSTD000.25

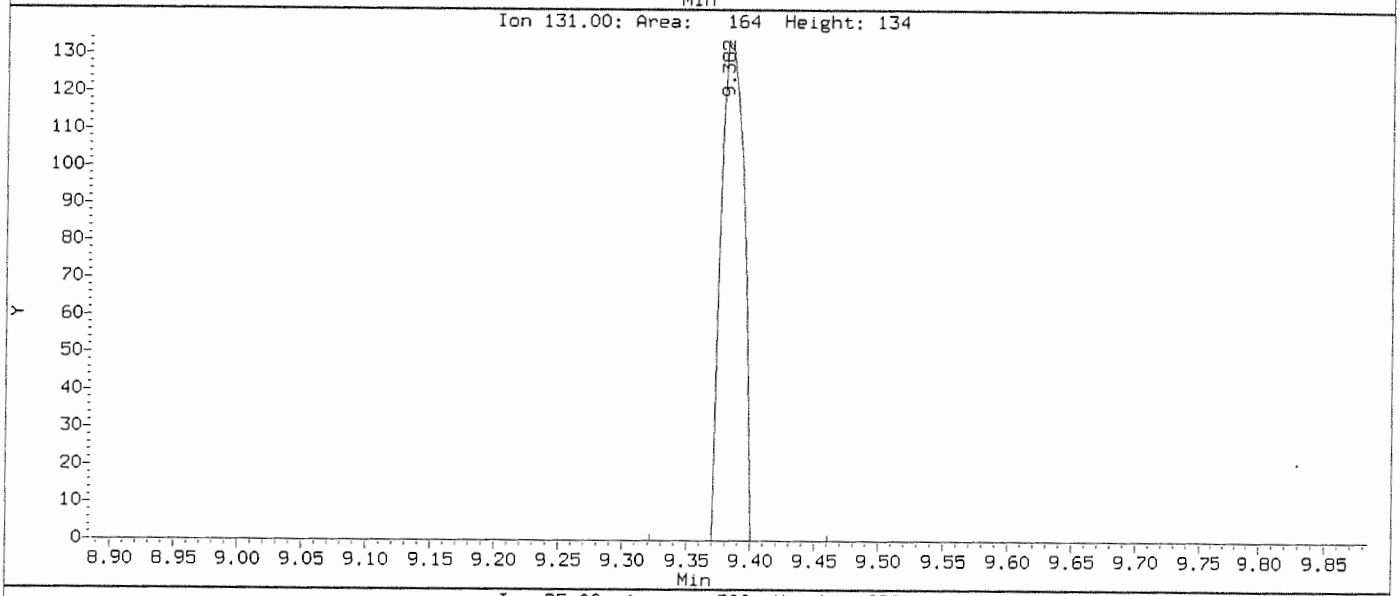
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CAS Number: 79-34-5

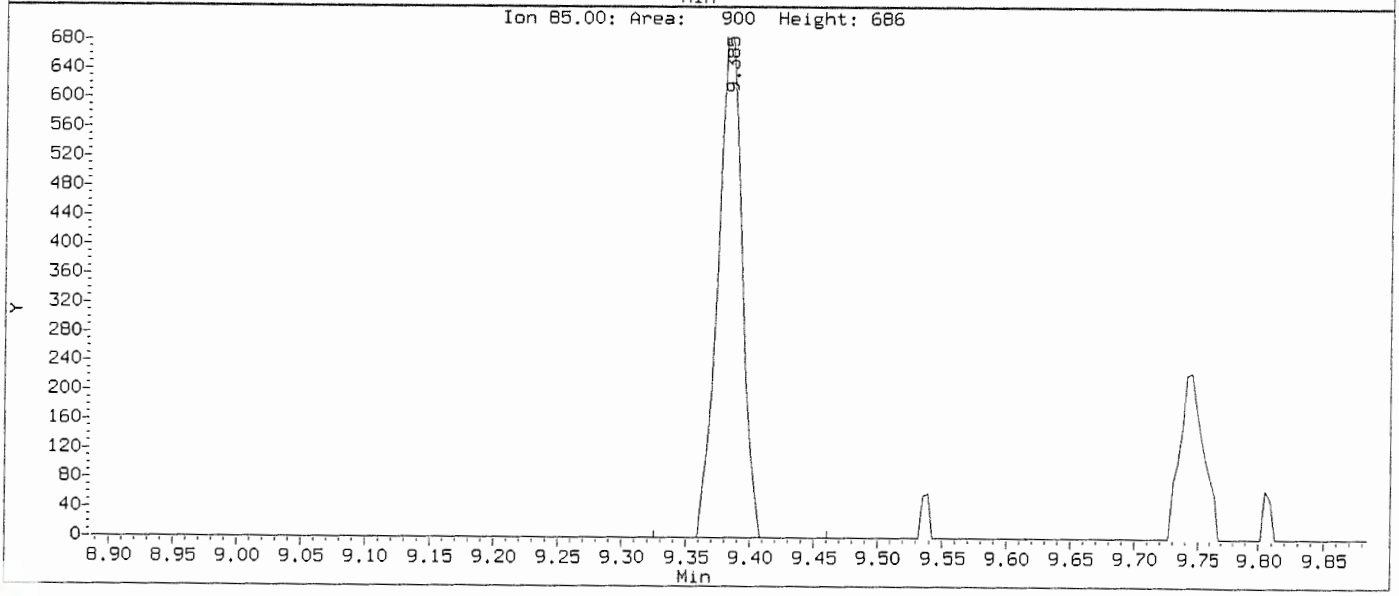


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Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5

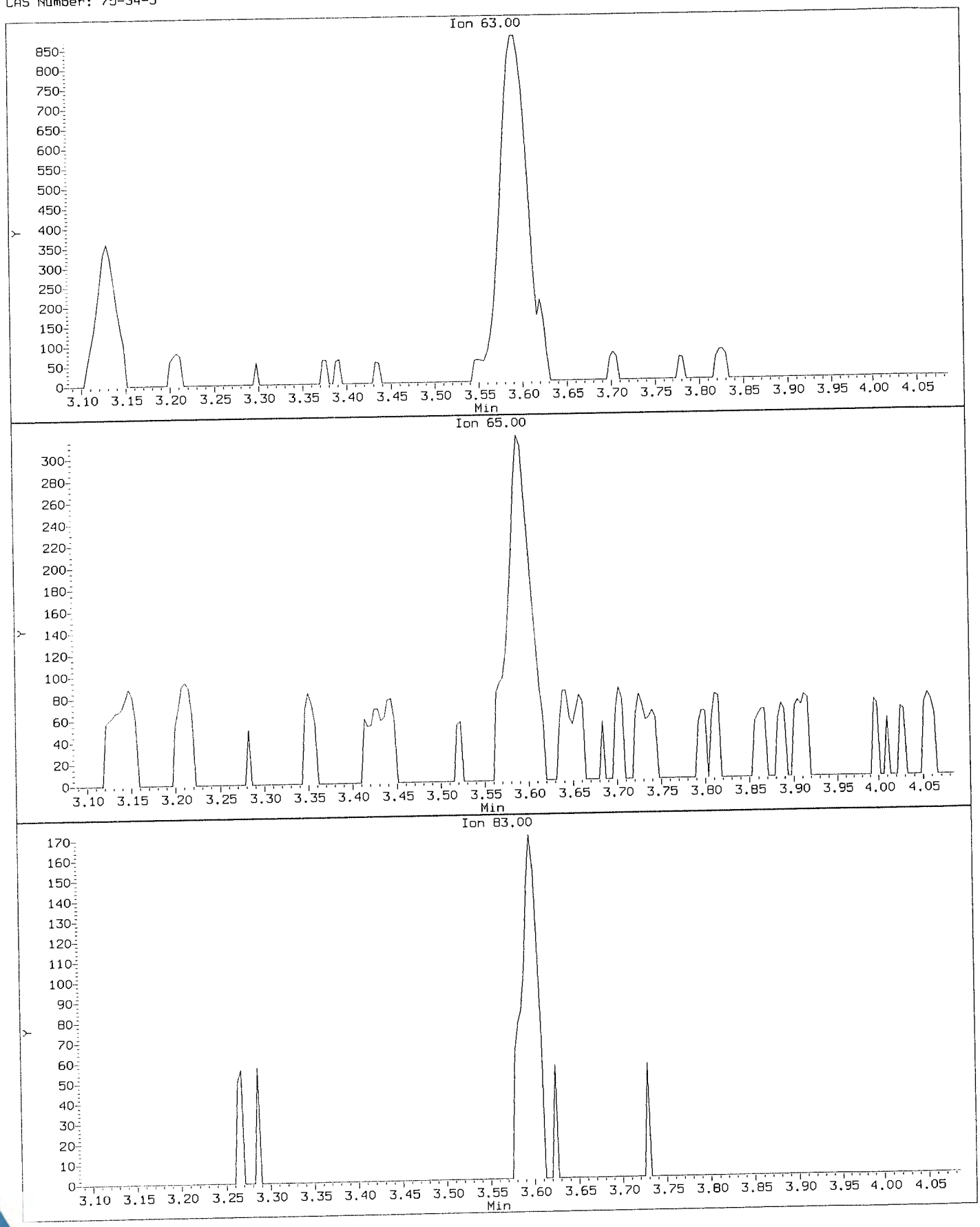






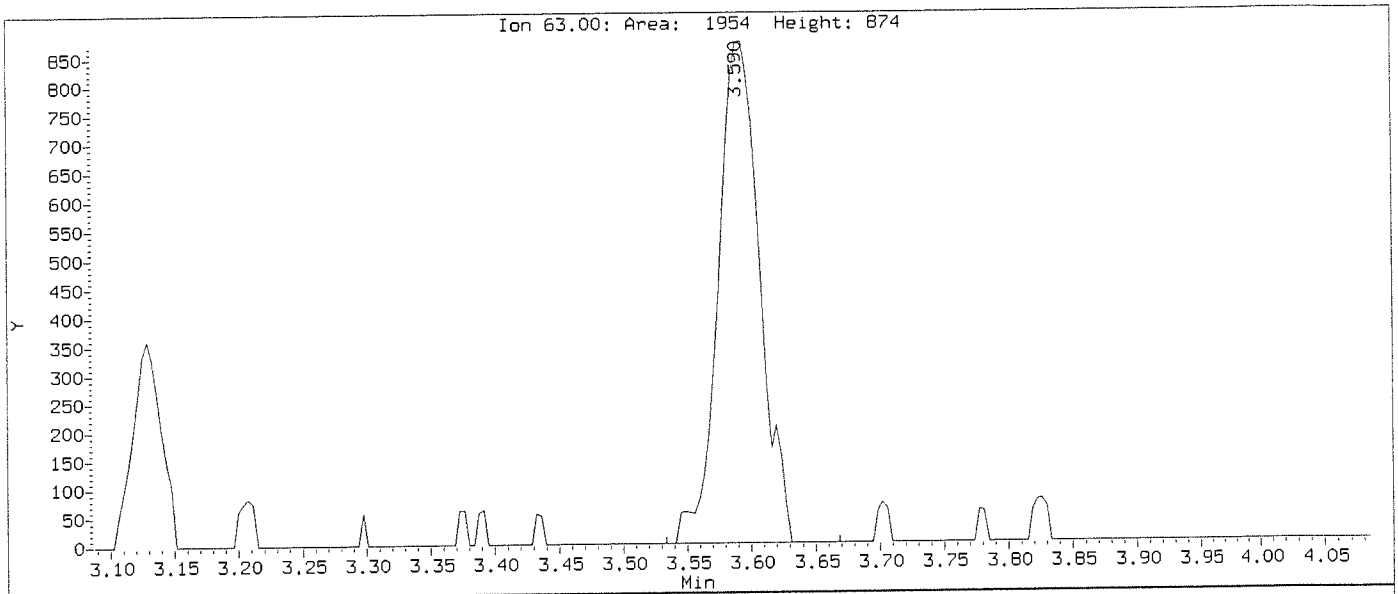
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Instrument: VOA9.i
Client Sample ID: VSTD000.25

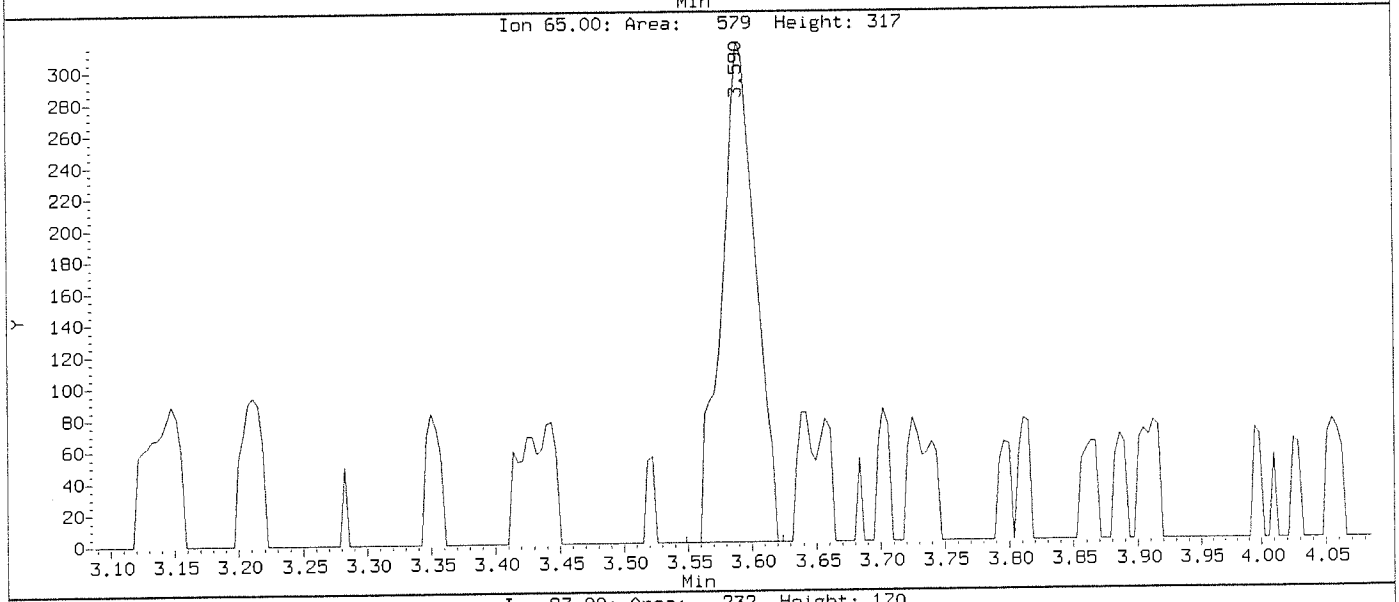
Compound: 1,1-Dichloroethane
CAS Number: 75-34-3

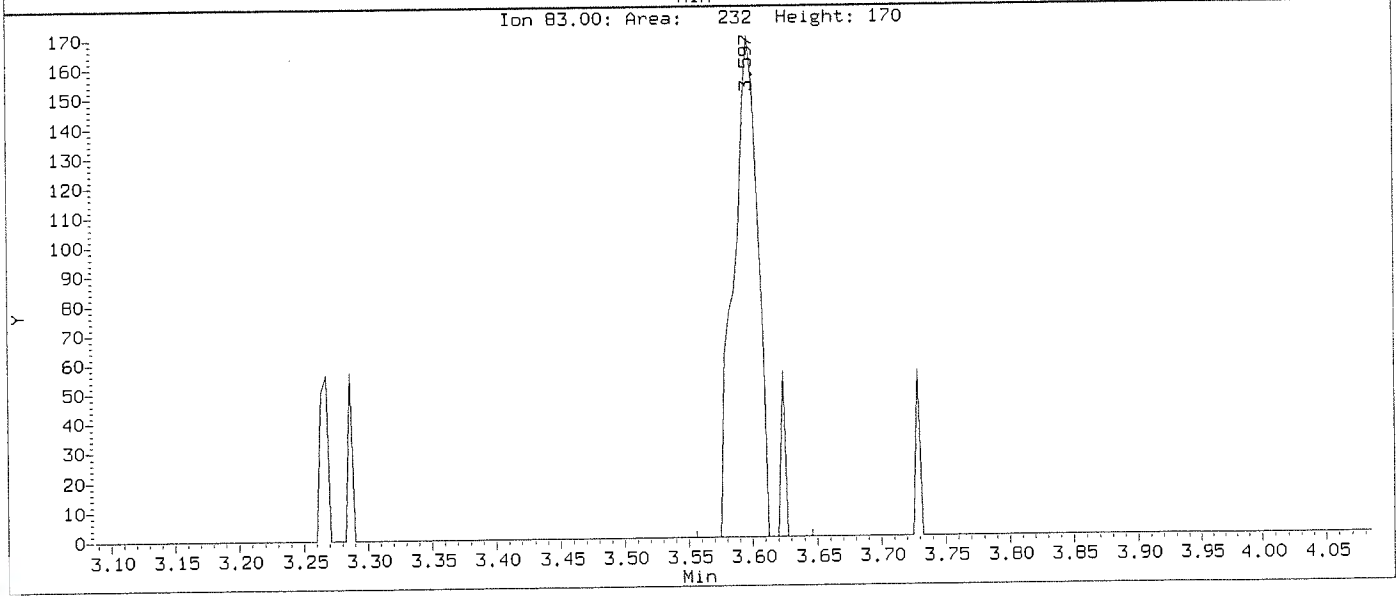


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Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 1,1-Dichloroethane
CAS Number: 75-34-3

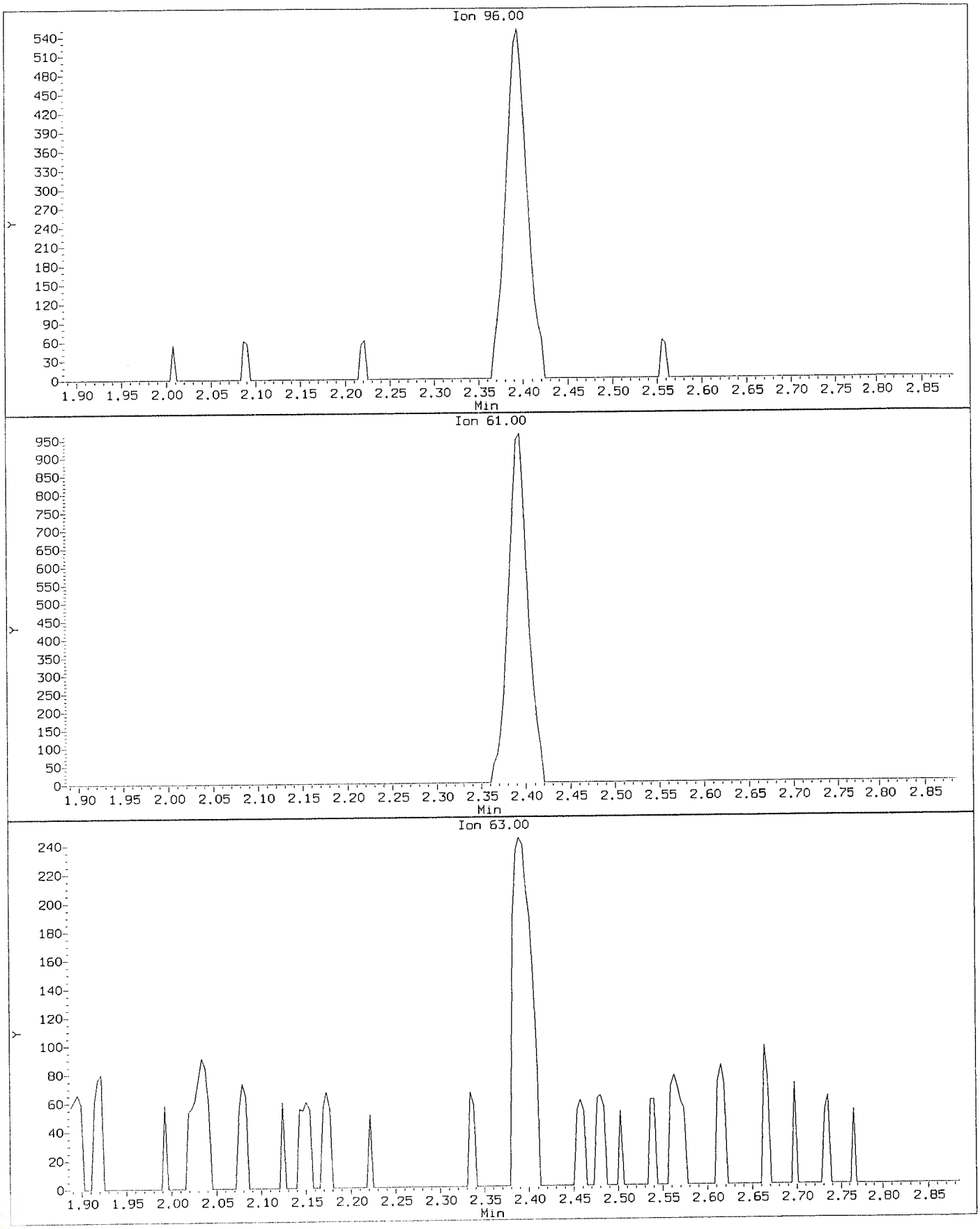






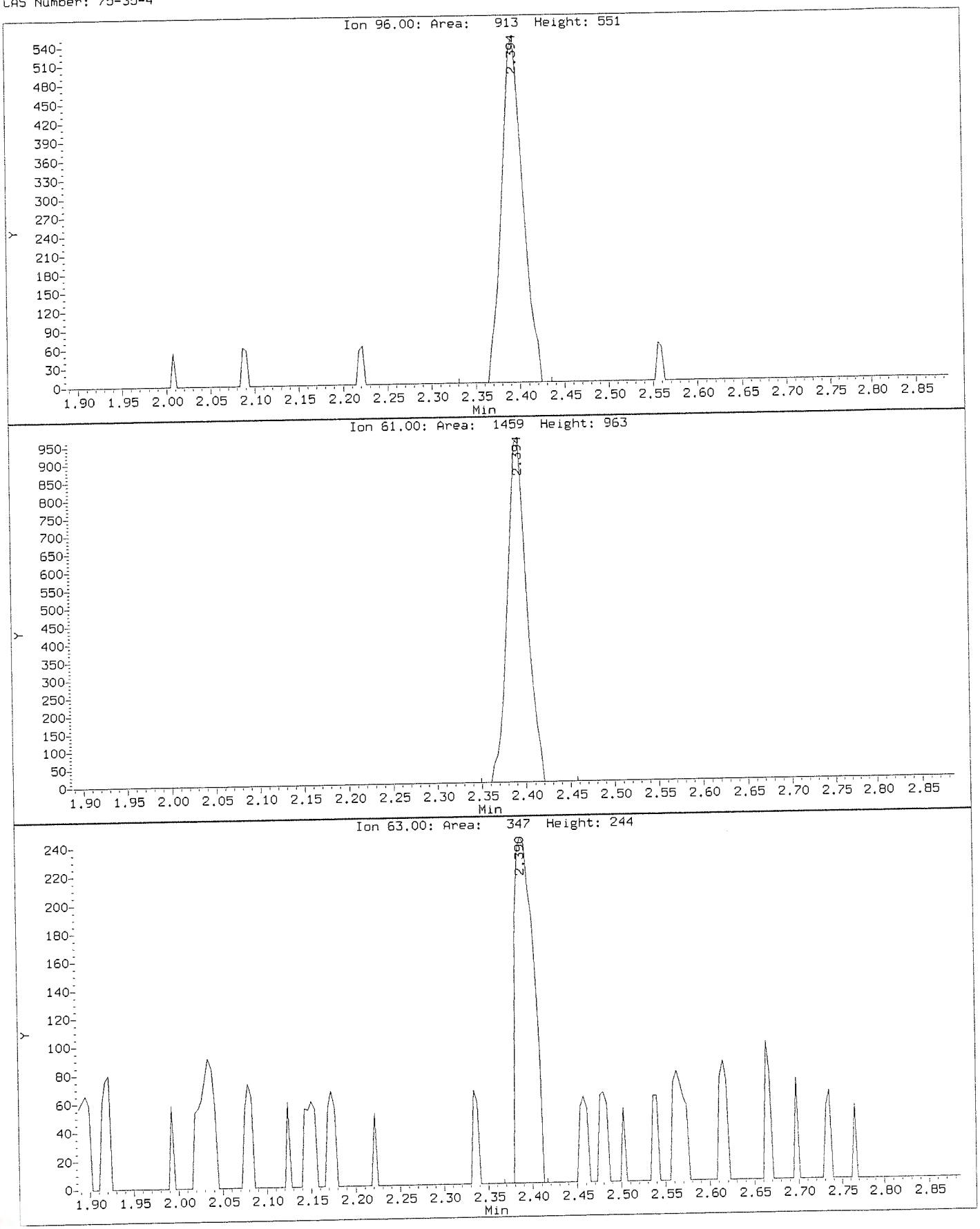
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Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 1,1-Dichloroethene
CAS Number: 75-35-4



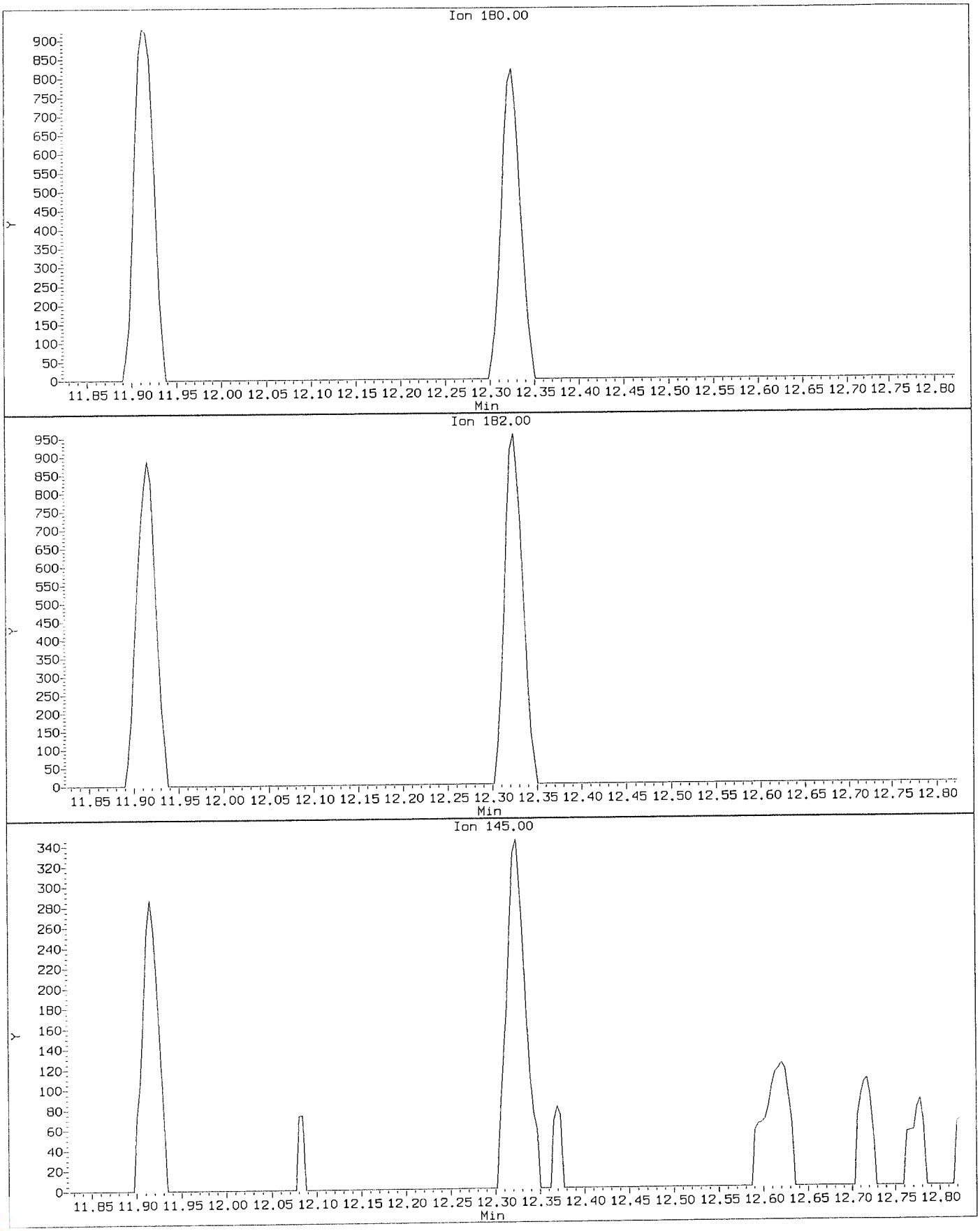
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Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 1,1-Dichloroethene
CAS Number: 75-35-4



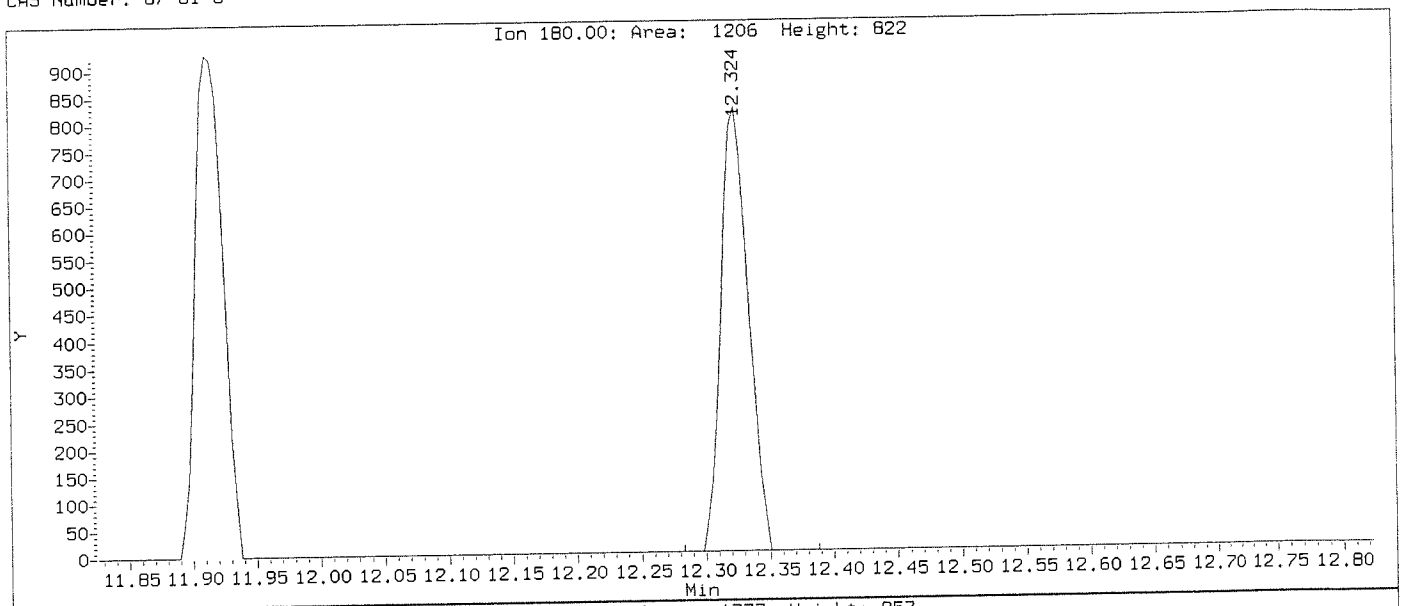
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Instrument: VOA9.i
Client Sample ID: VSTD000.25

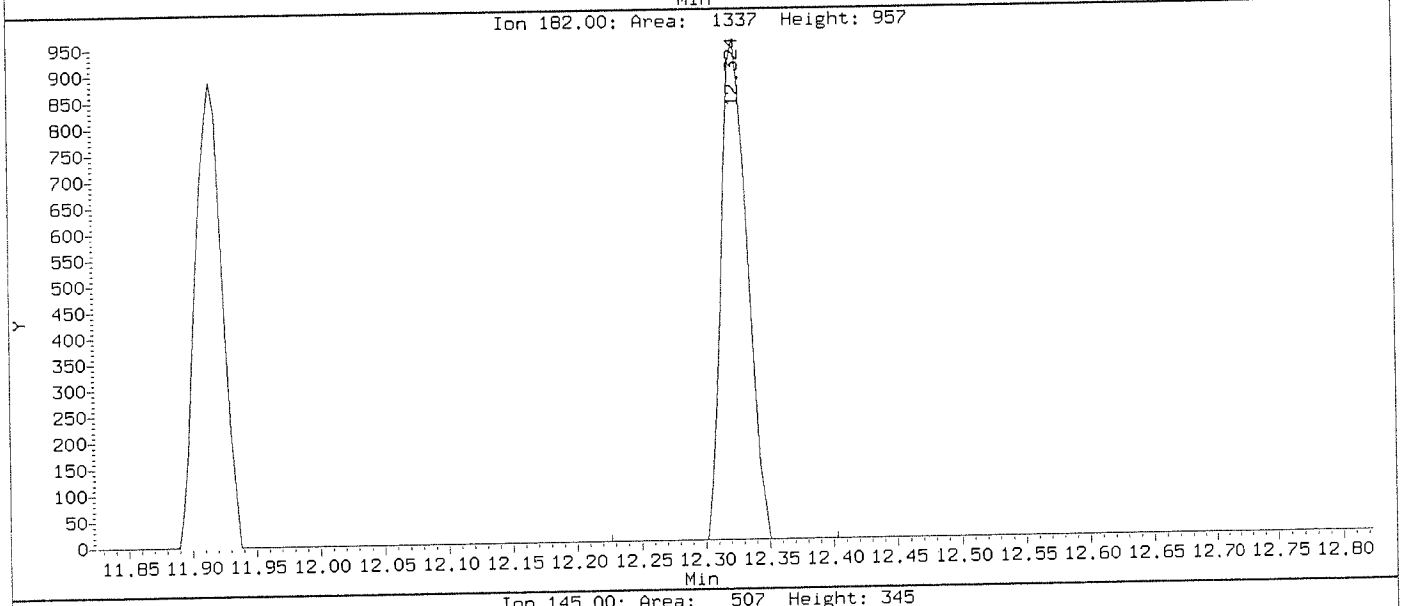
Compound: 1,2,3-Trichlorobenzene
CAS Number: 87-61-6

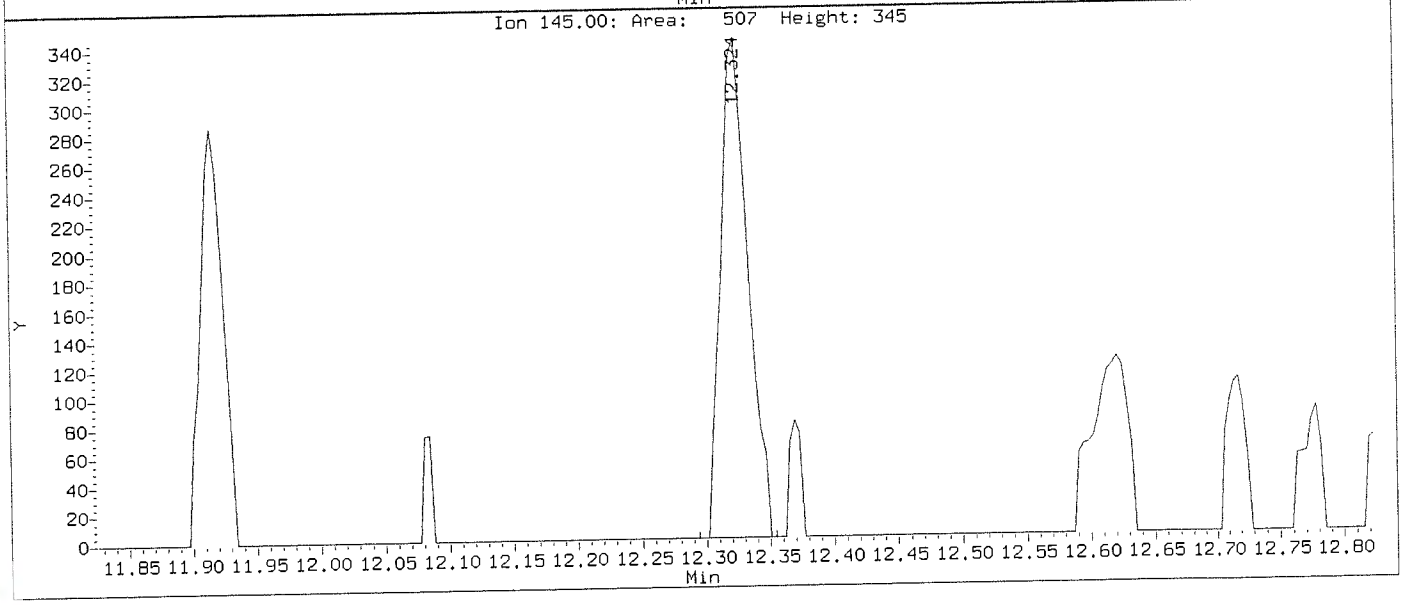


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Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 1,2,3-Trichlorobenzene
CAS Number: 87-61-6

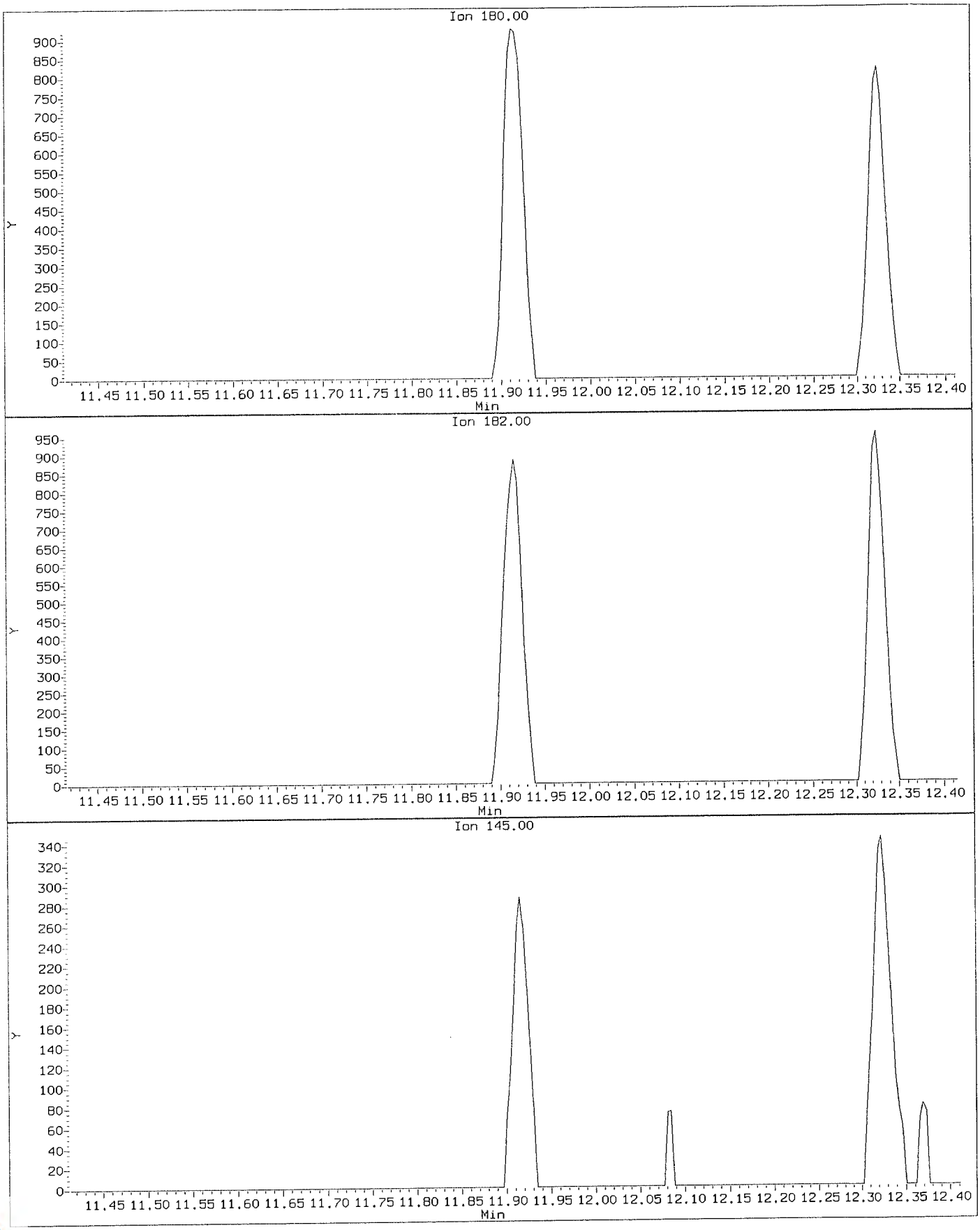






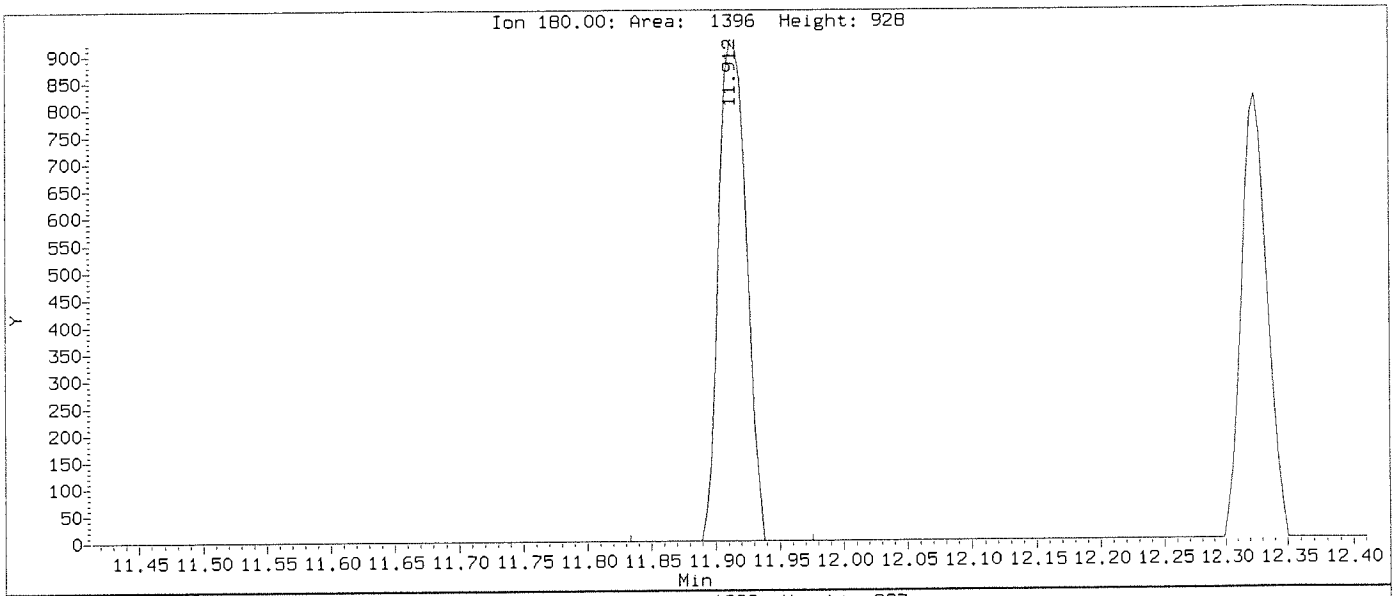
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Client Sample ID: VSTD000.25

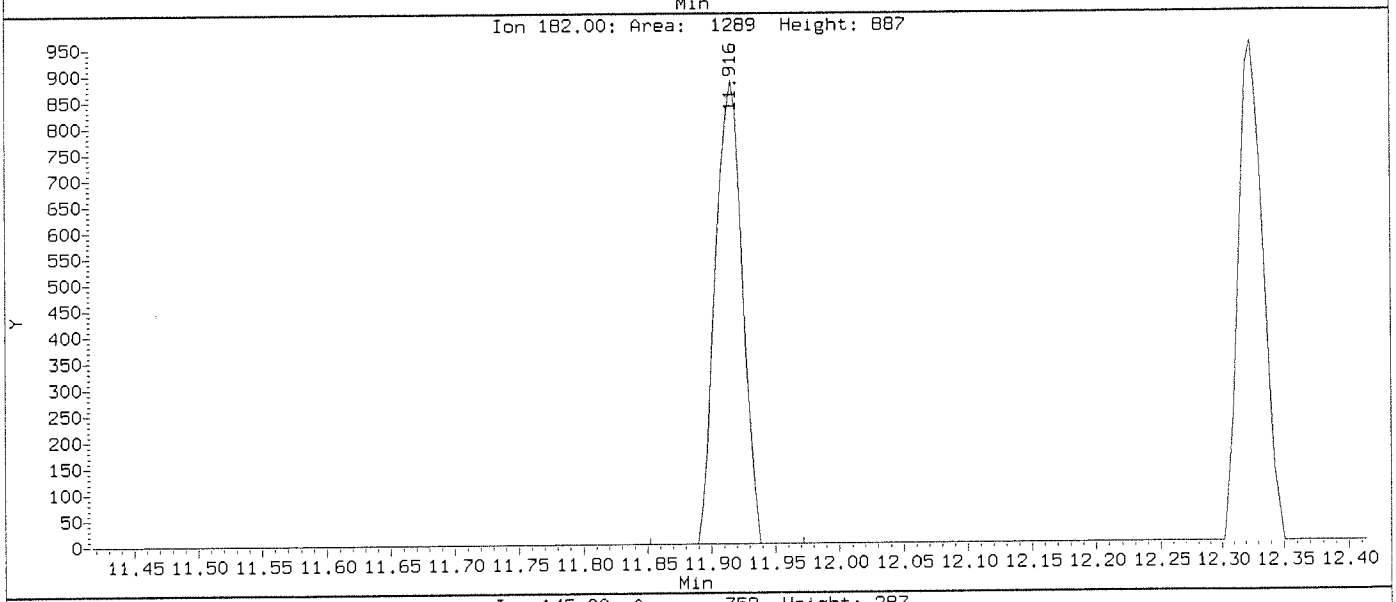
Compound: 1,2,4-Trichlorobenzene
CAS Number: 120-82-1

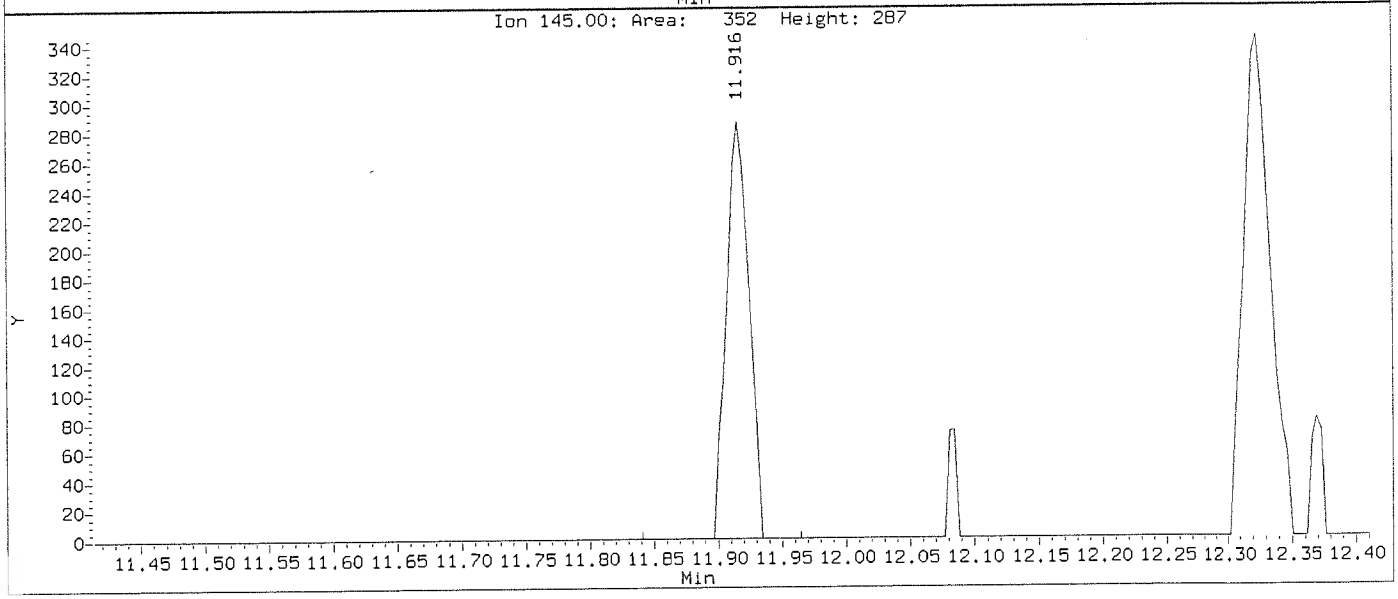


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Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 1,2,4-Trichlorobenzene
CAS Number: 120-82-1

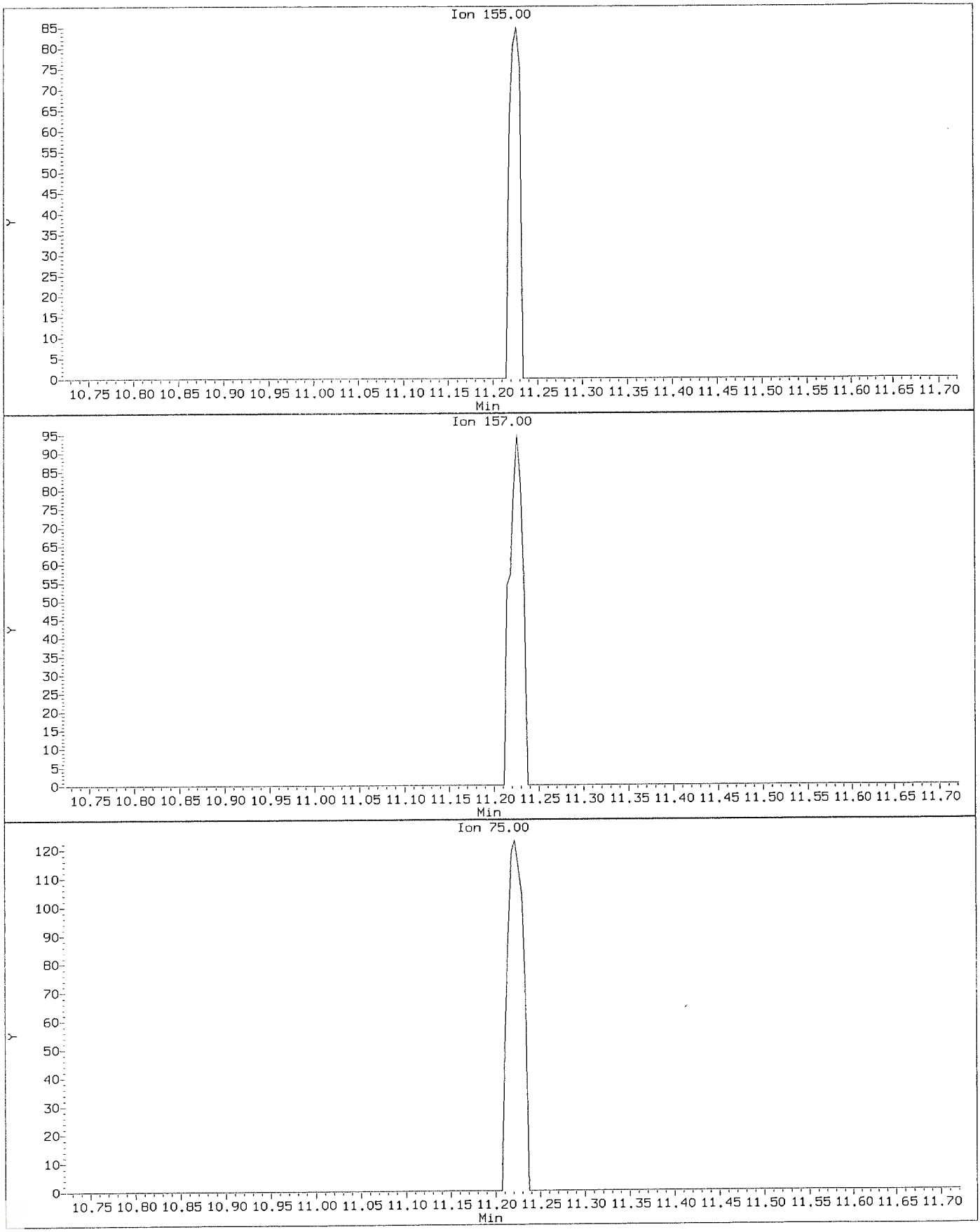






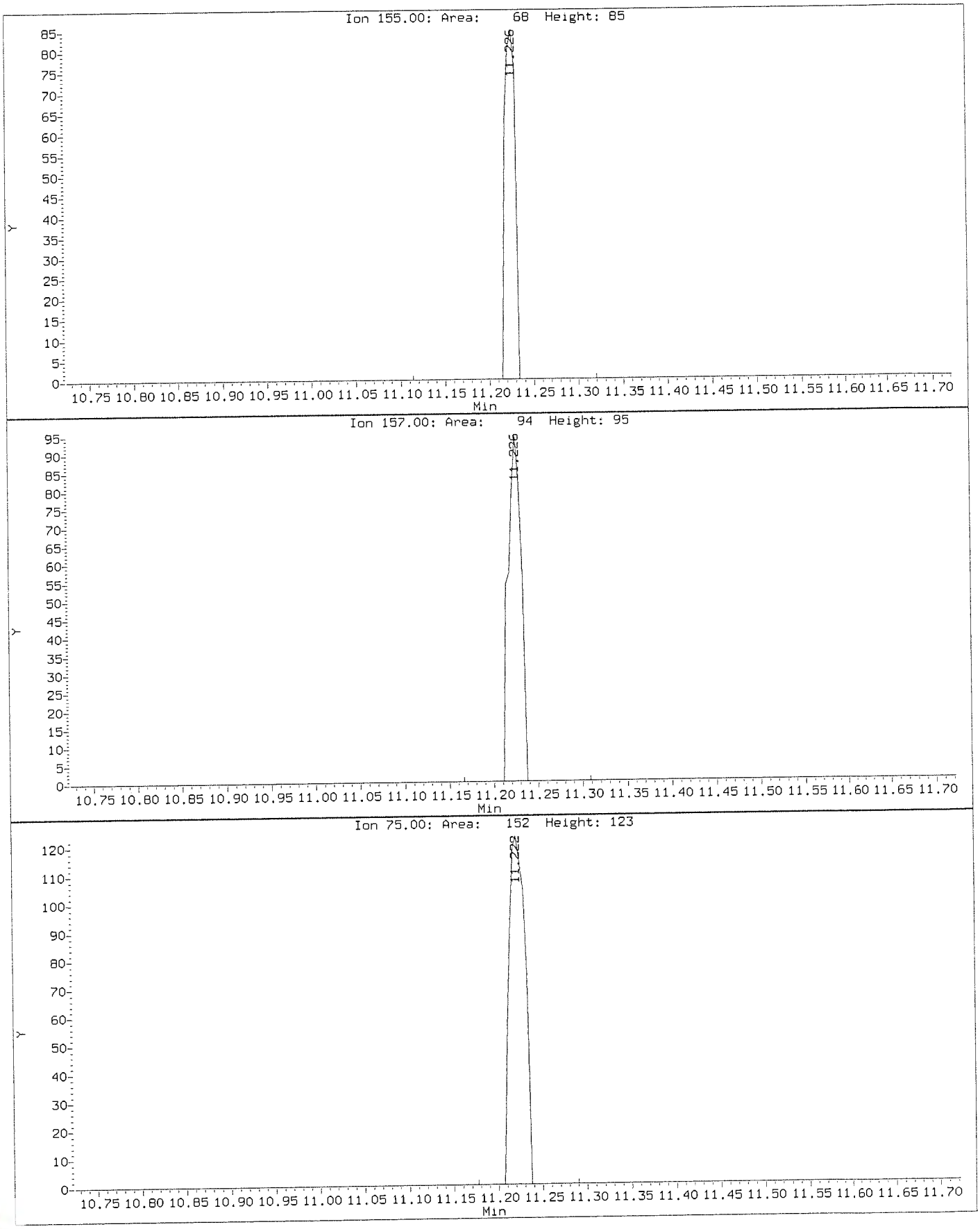
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Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8



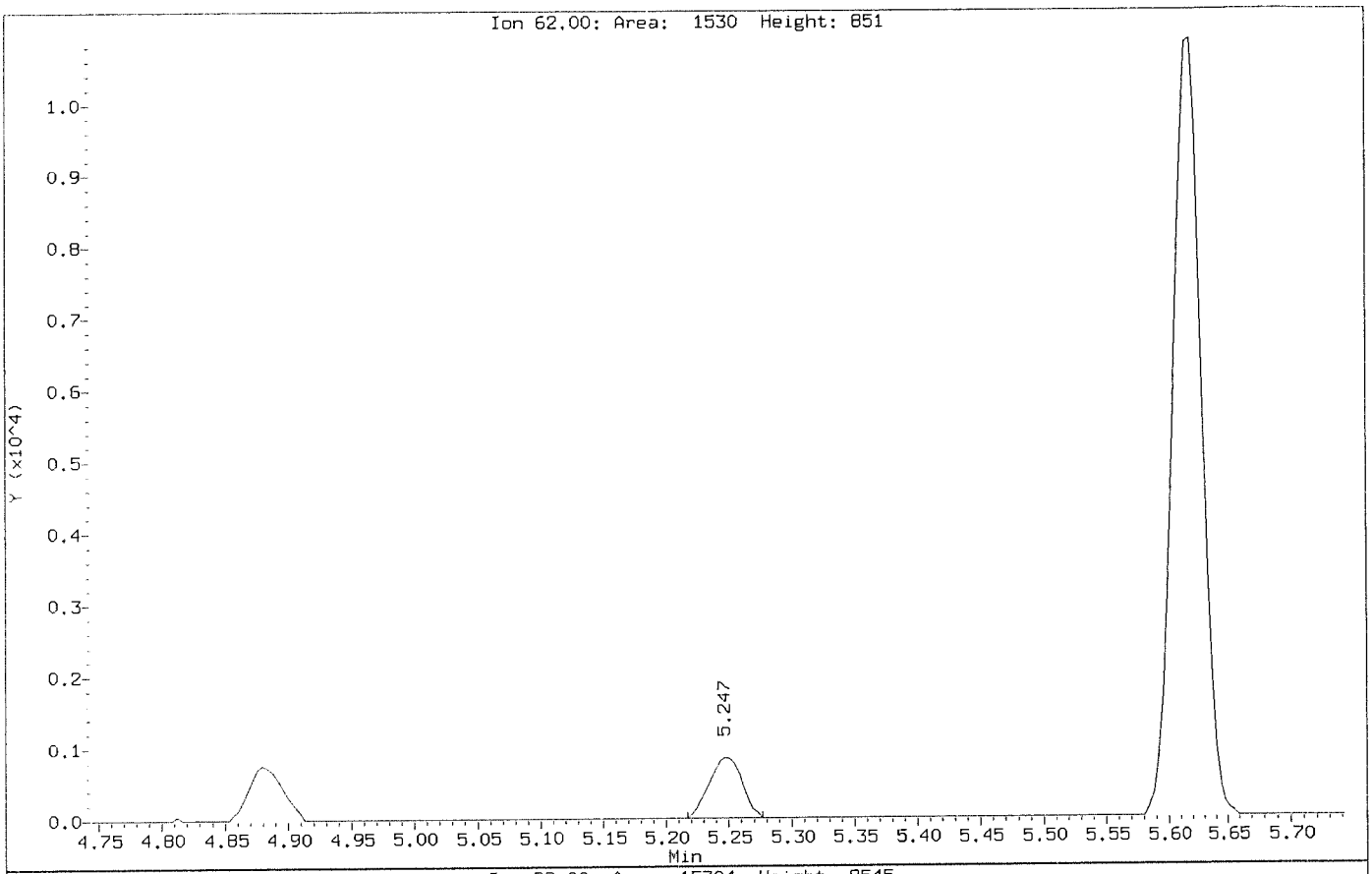
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Client Sample ID: VSTD000.25

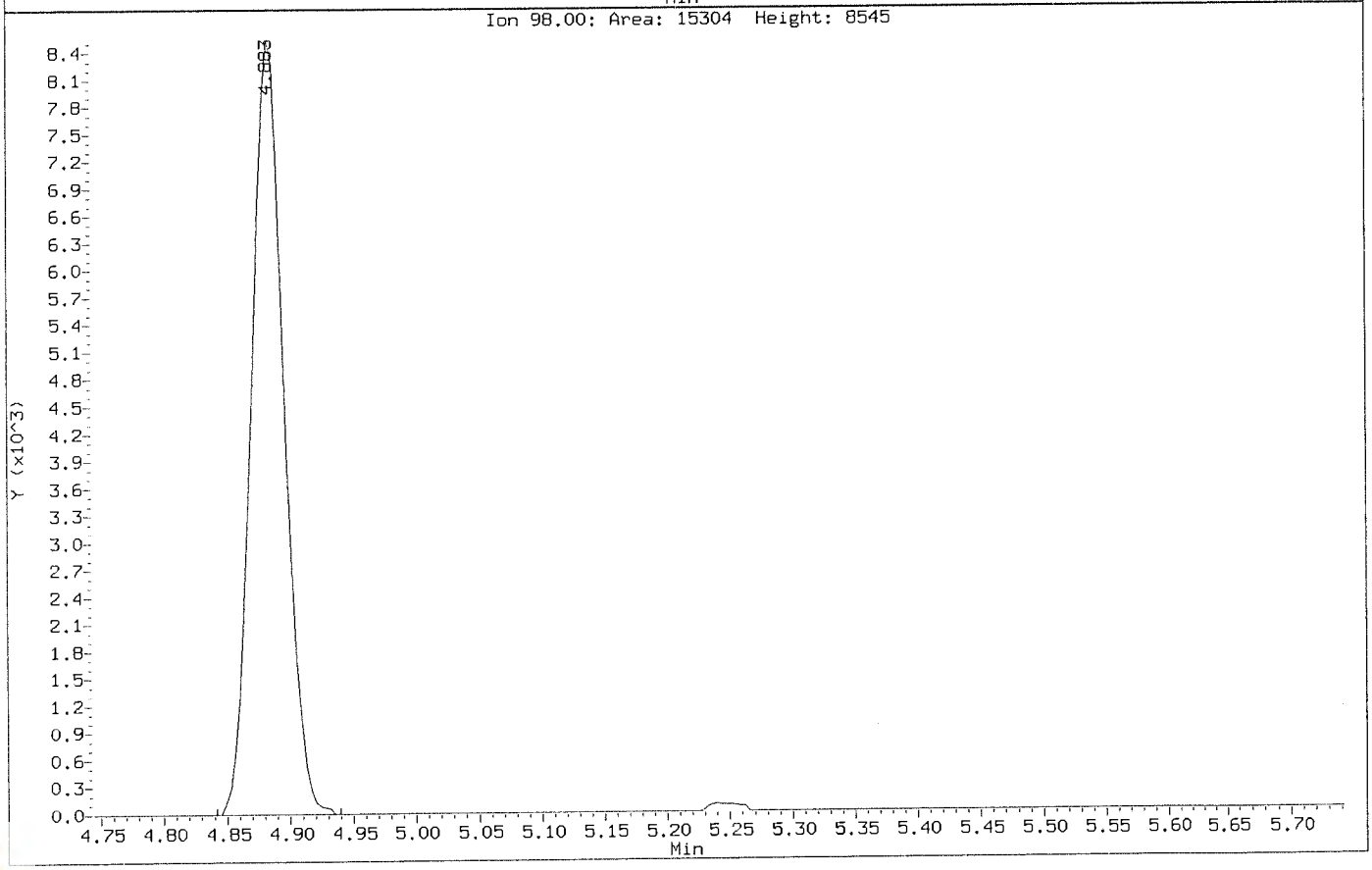
Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8



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Client Sample ID: VSTD000.25

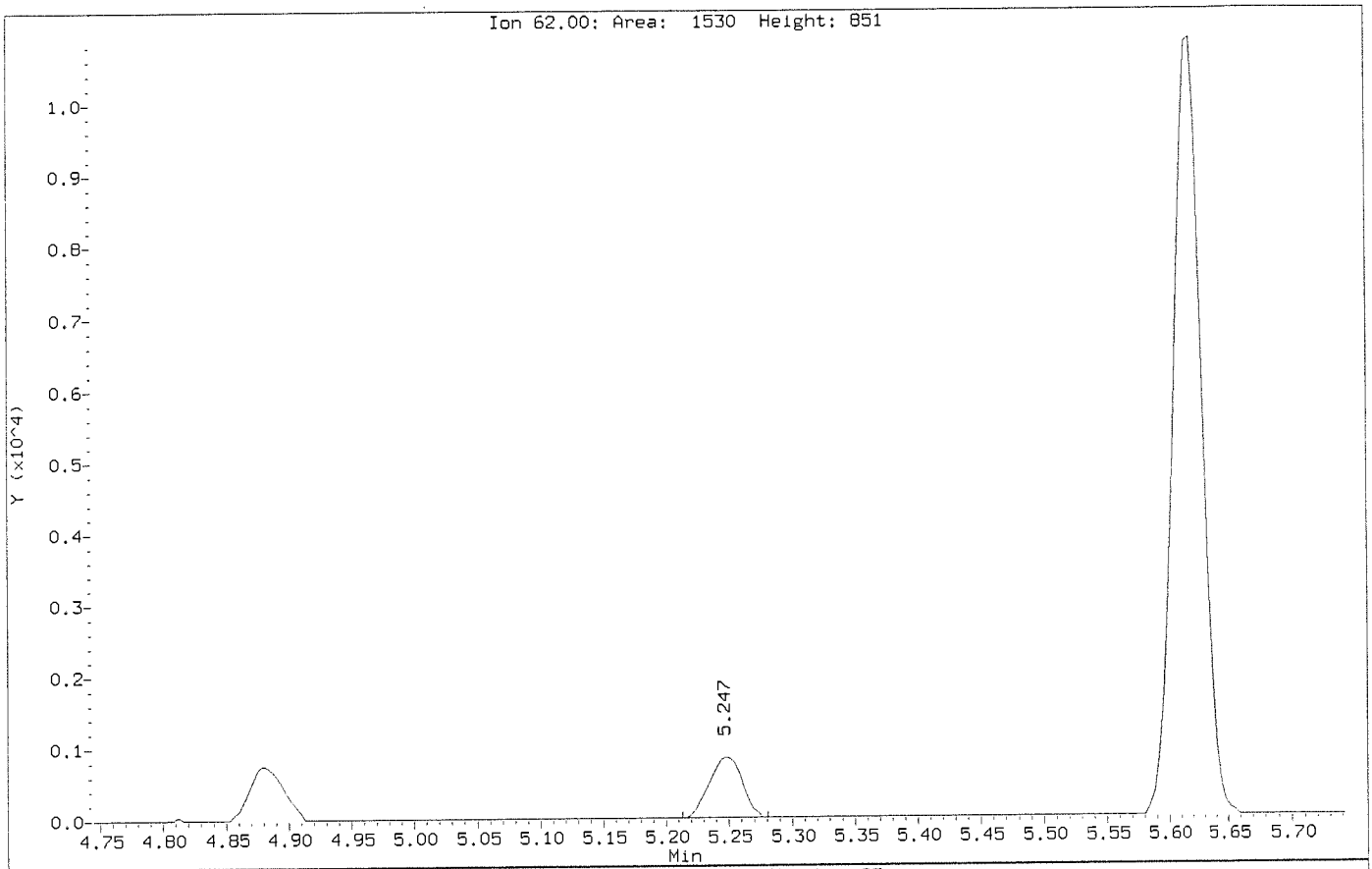
Compound: 1,2-Dichloroethane
CAS Number: 107-06-2

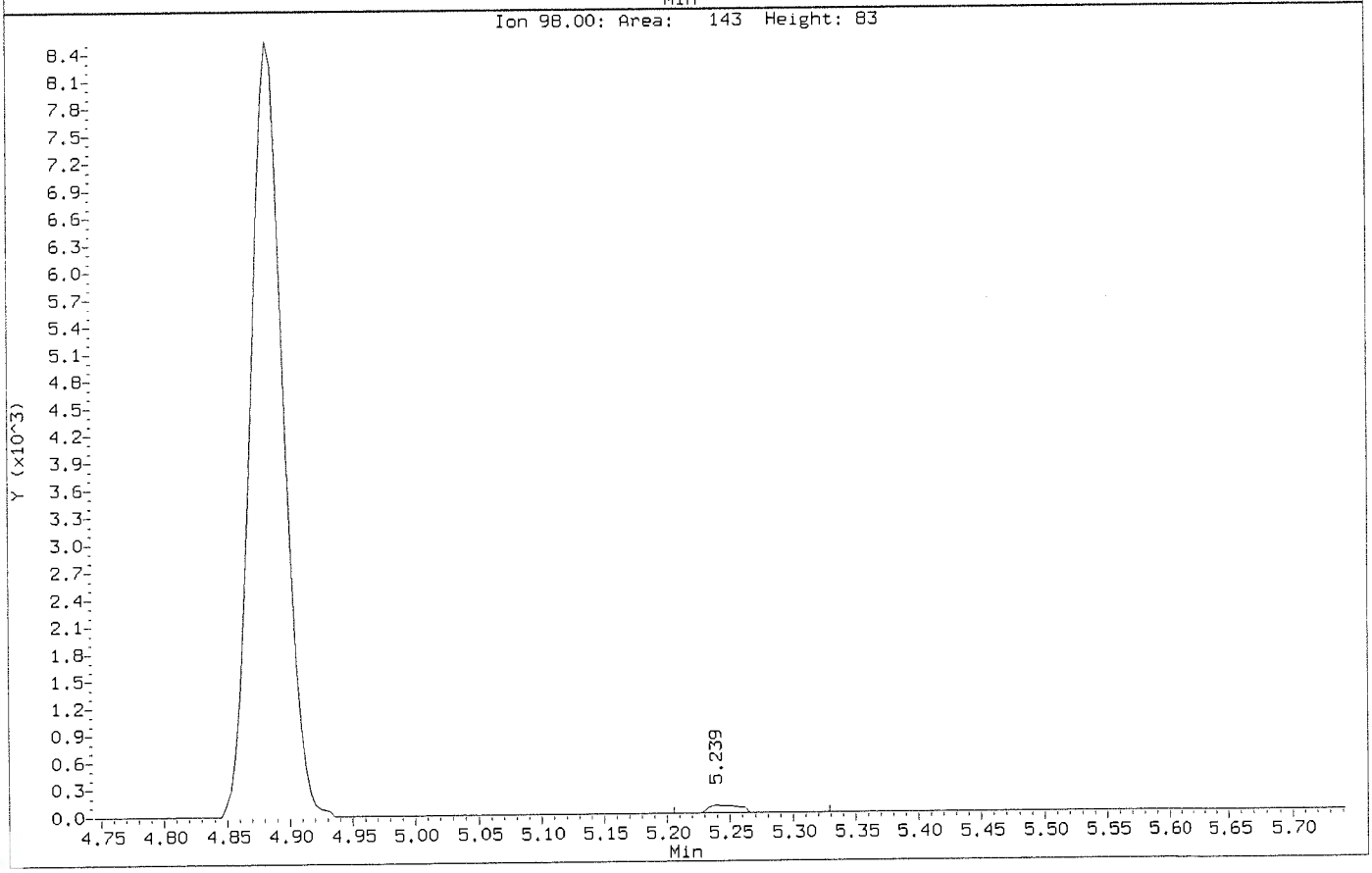




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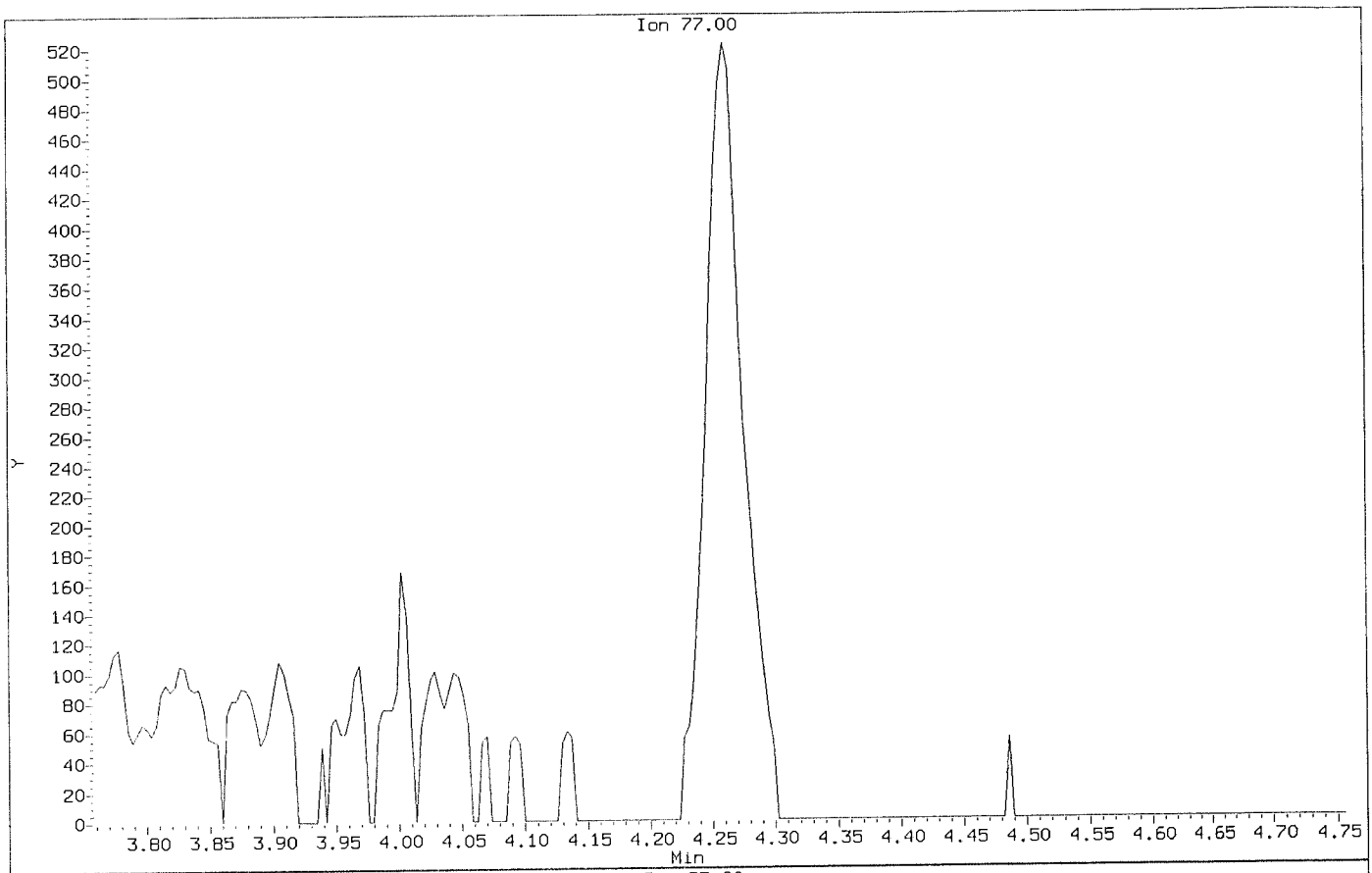
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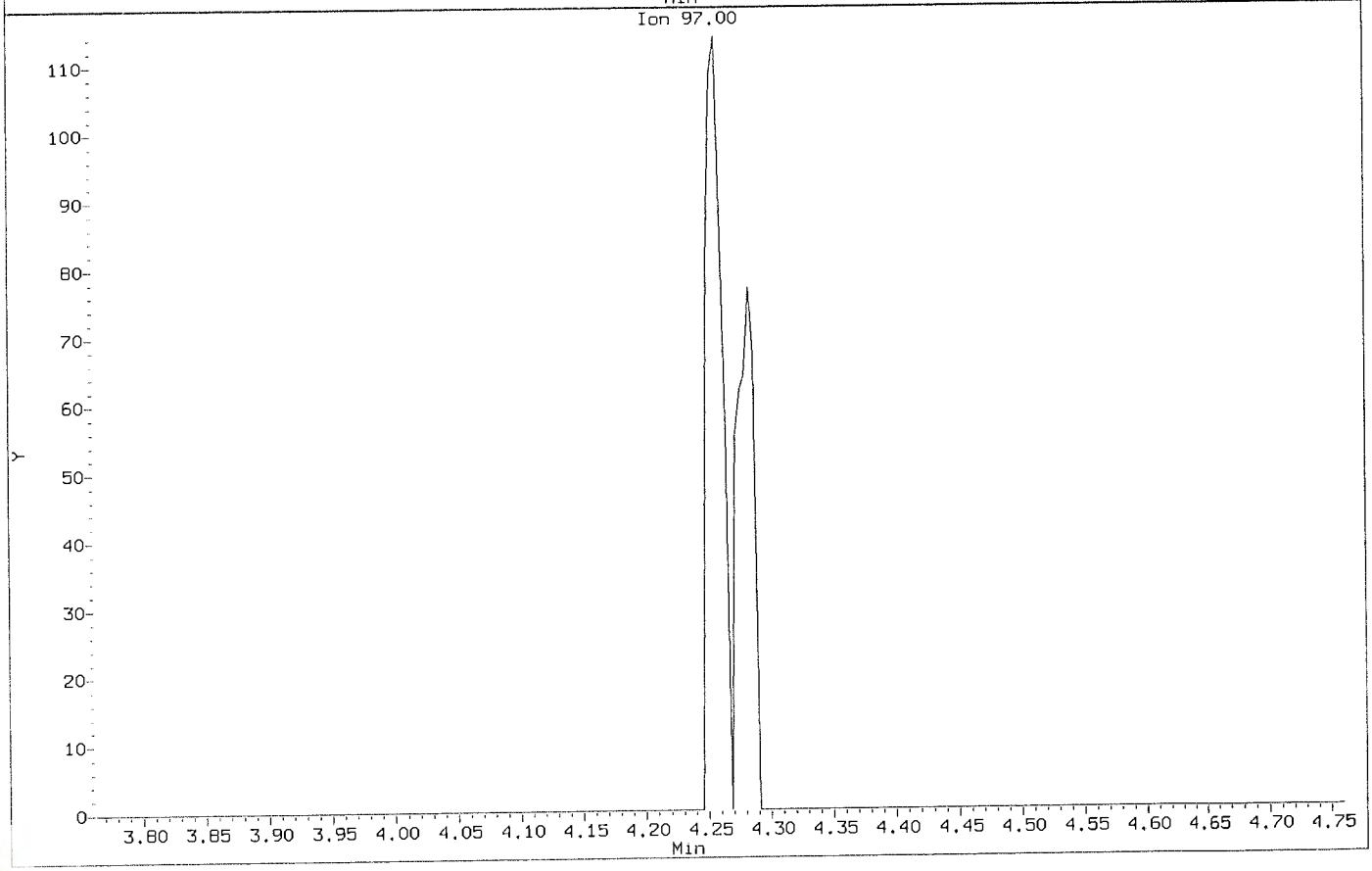




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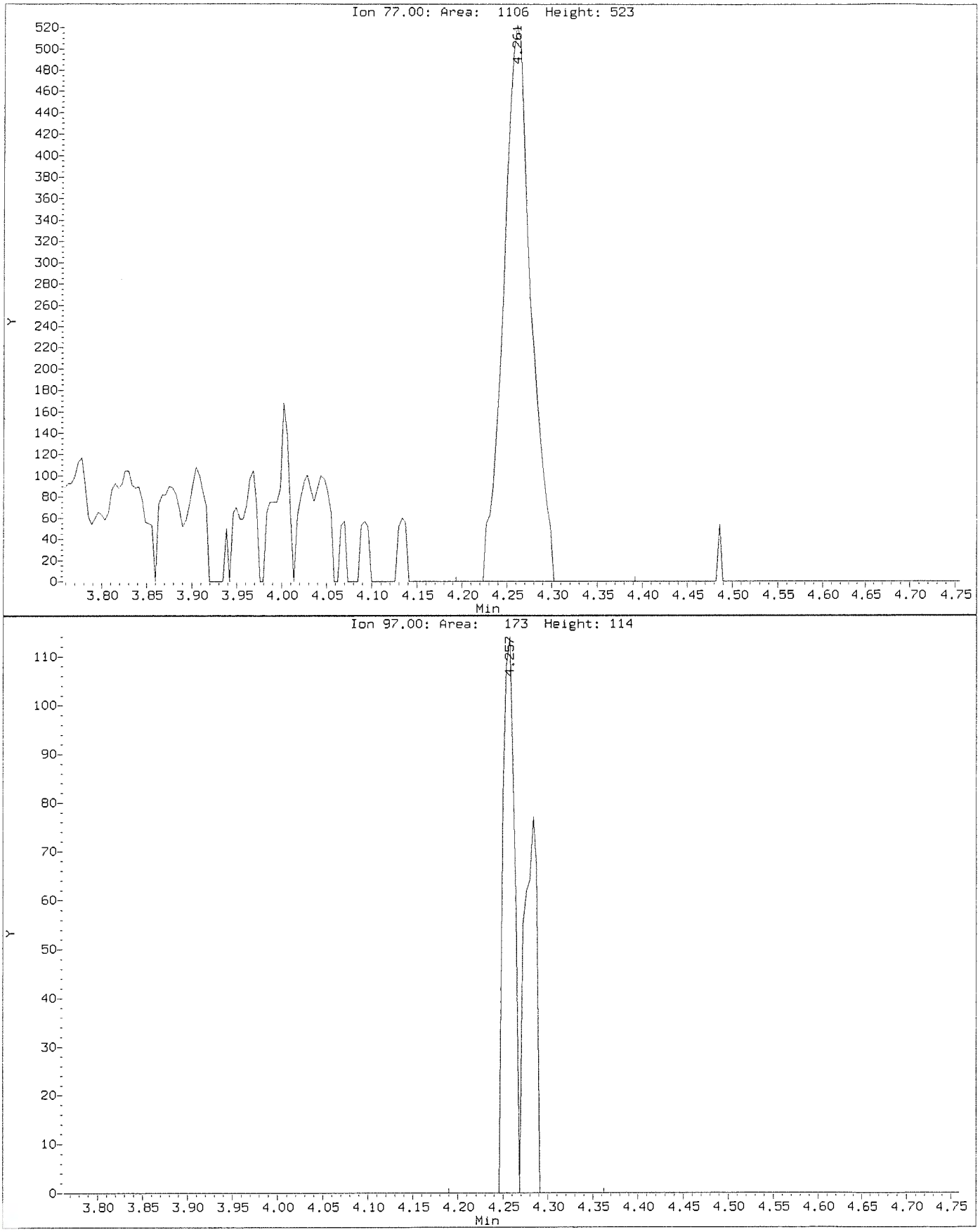
Compound: 2,2-Dichloropropane
CAS Number: 594-20-7





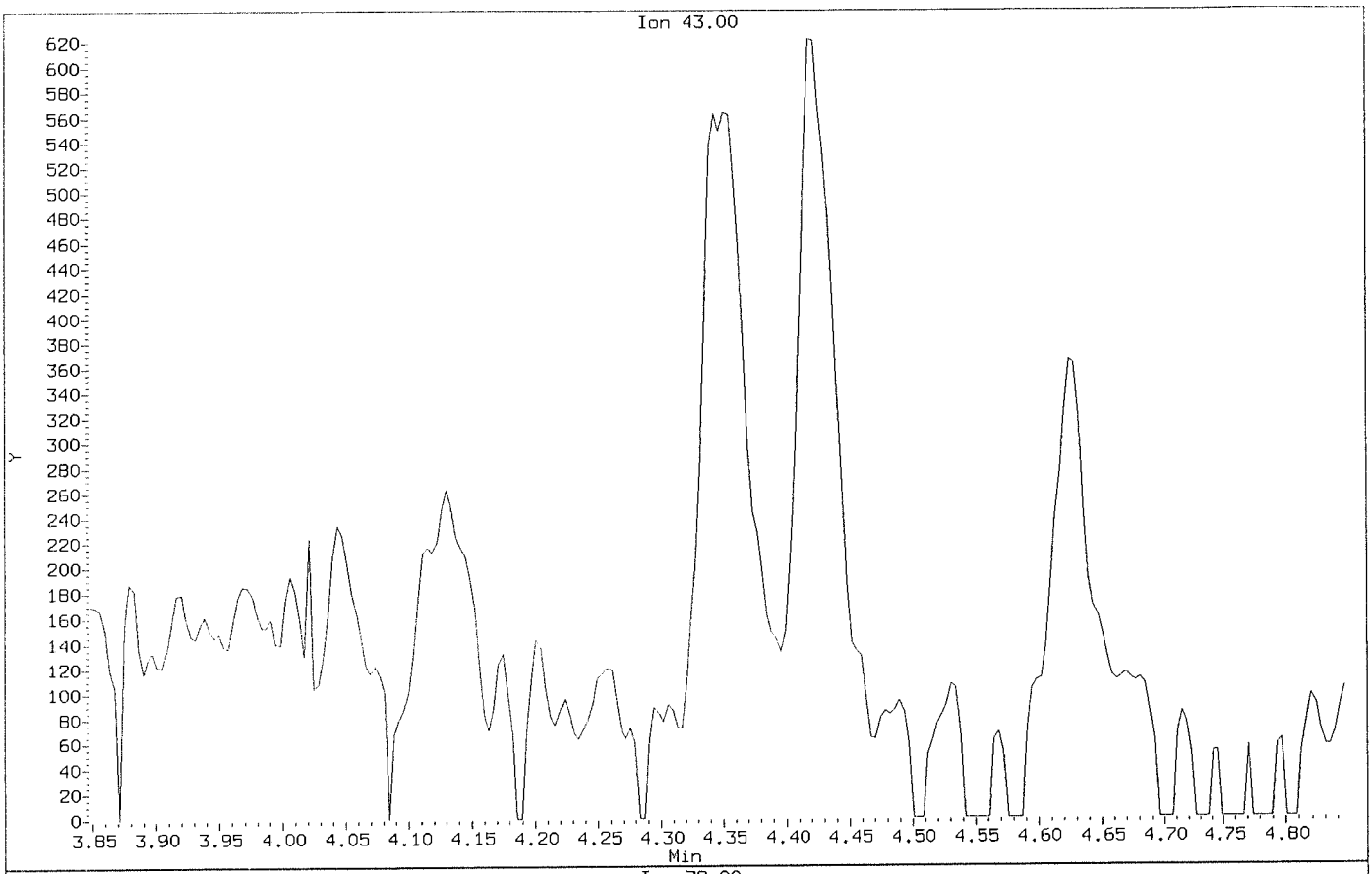
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Client Sample ID: VSTD000.25

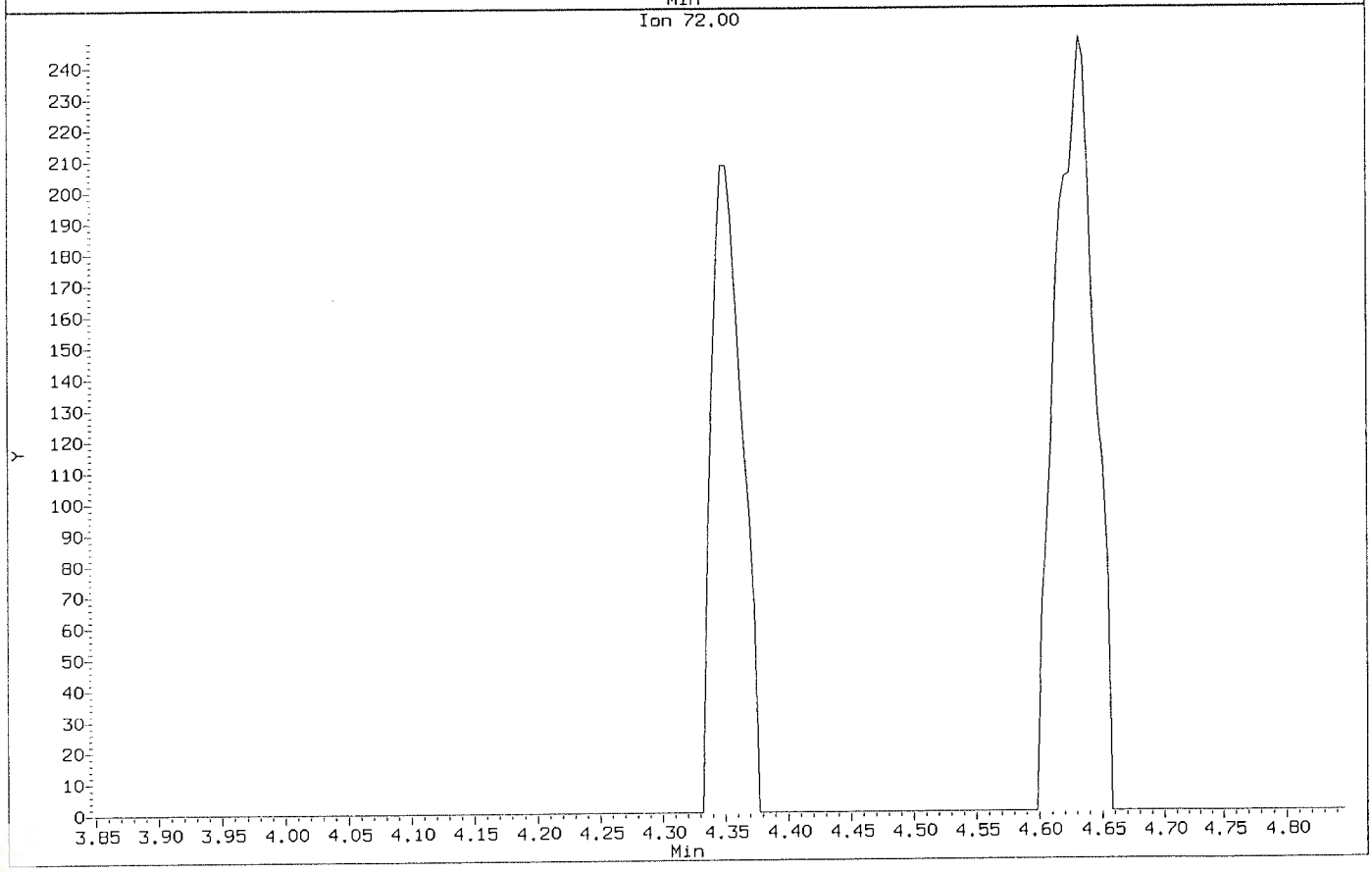
Compound: 2,2-Dichloropropane
CAS Number: 594-20-7



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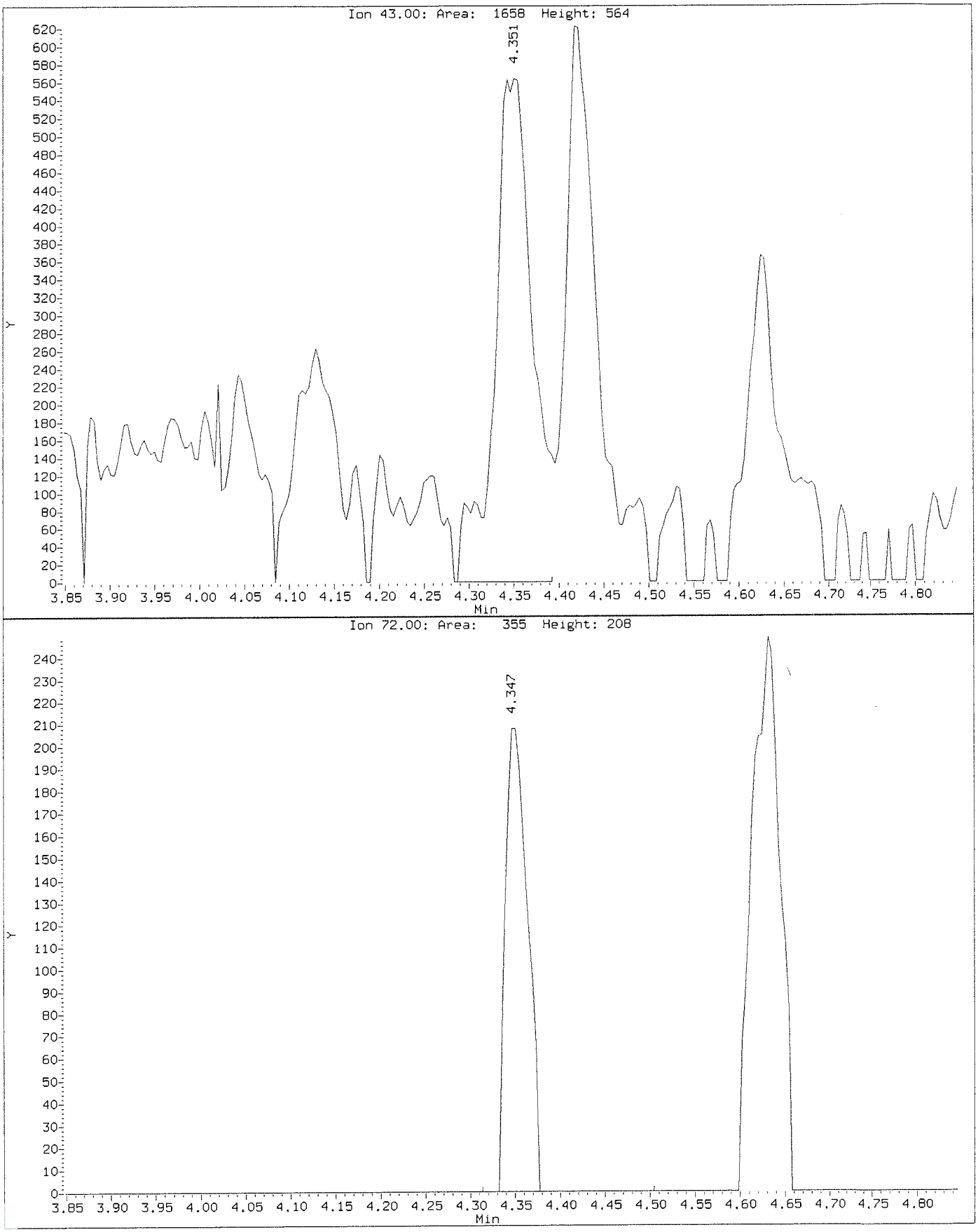
Compound: 2-Butanone
CAS Number: 78-93-3





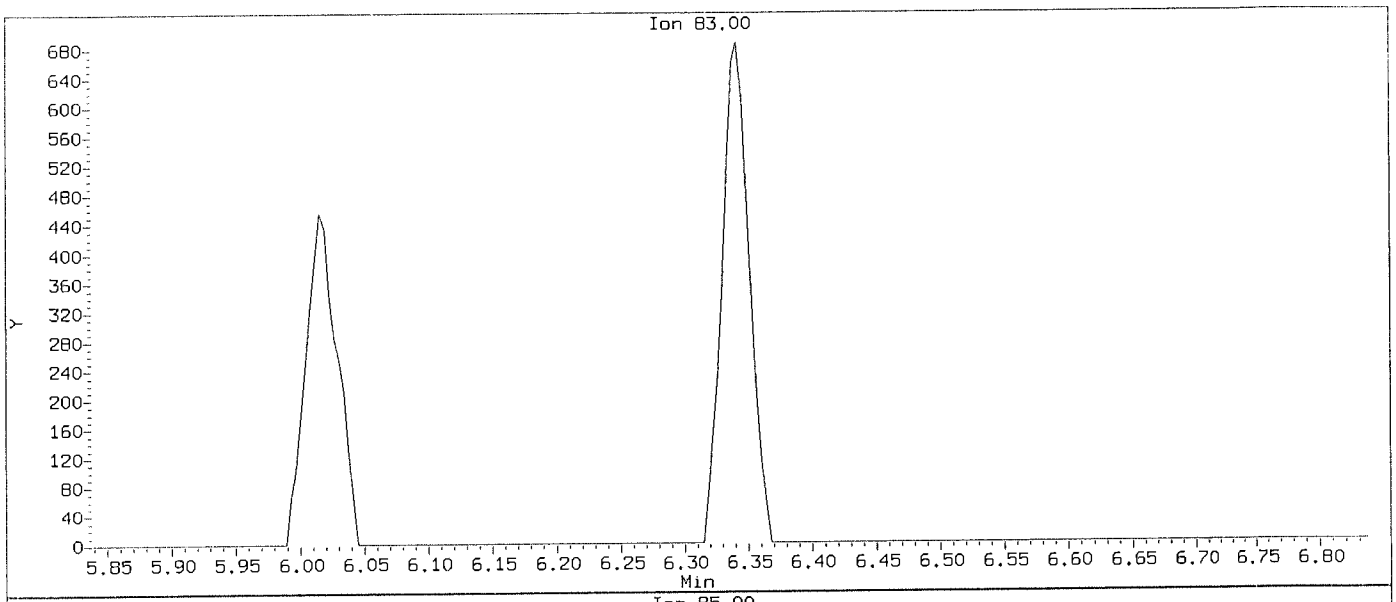
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Client Sample ID: VSTD000.25

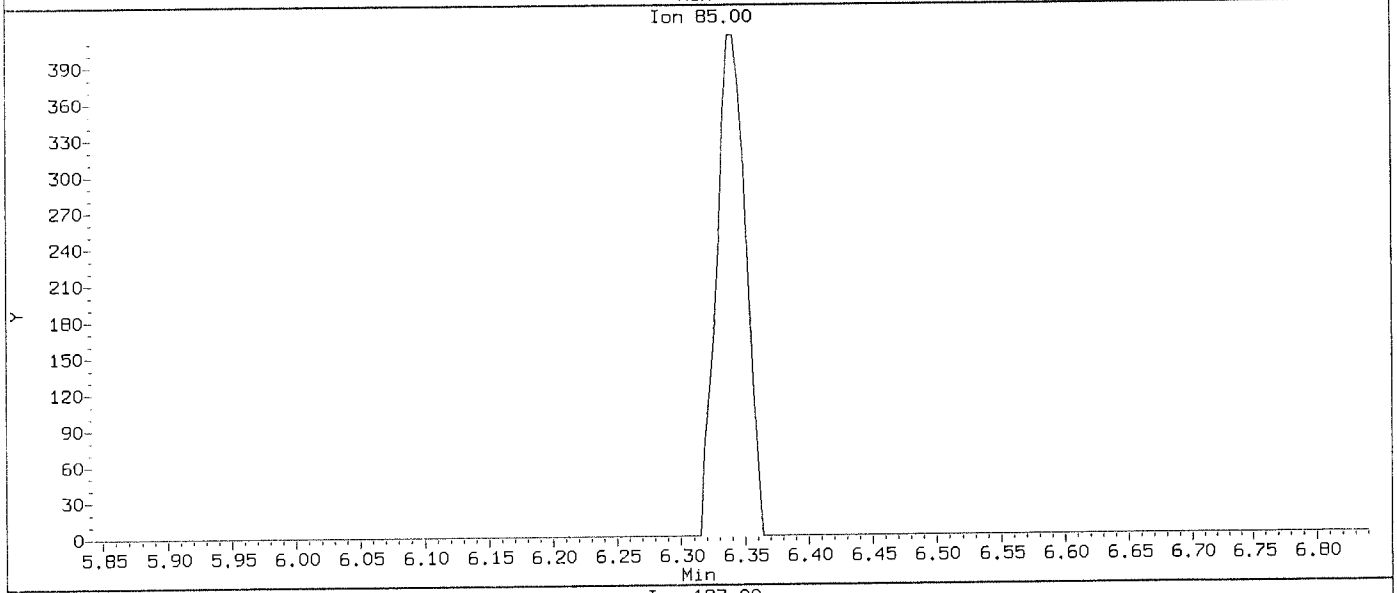
Compound: 2-Butanone
CAS Number: 78-93-3

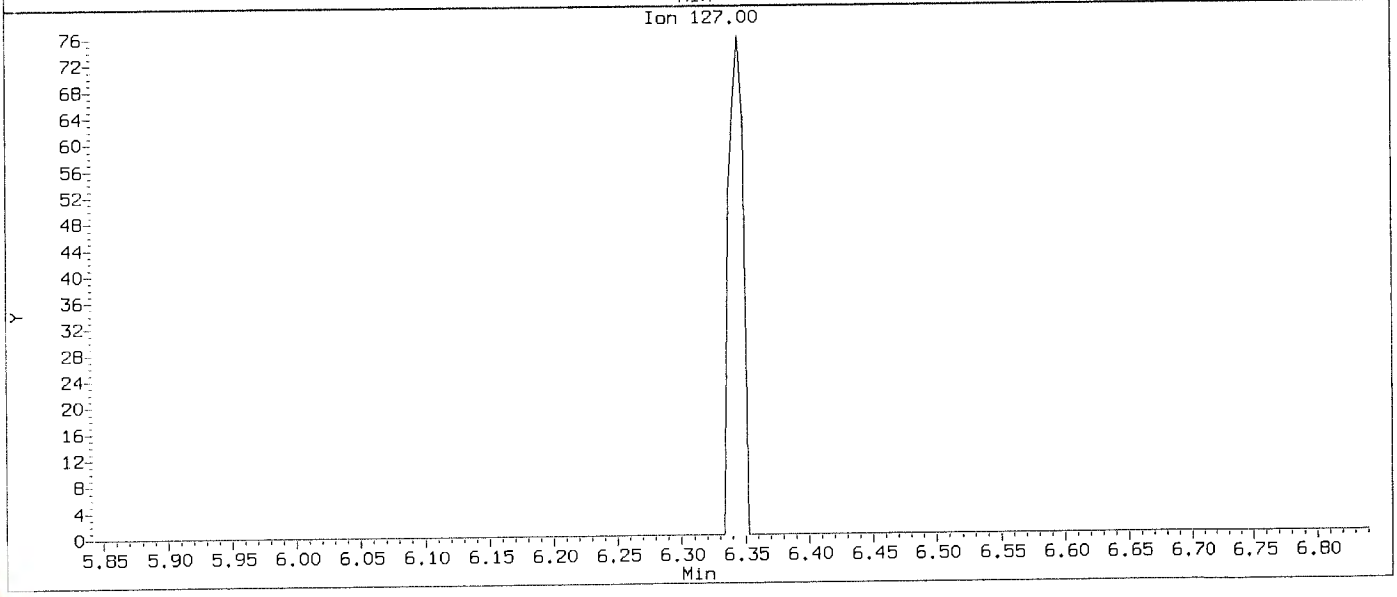


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Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: Bromodichloromethane
CAS Number: 75-27-4

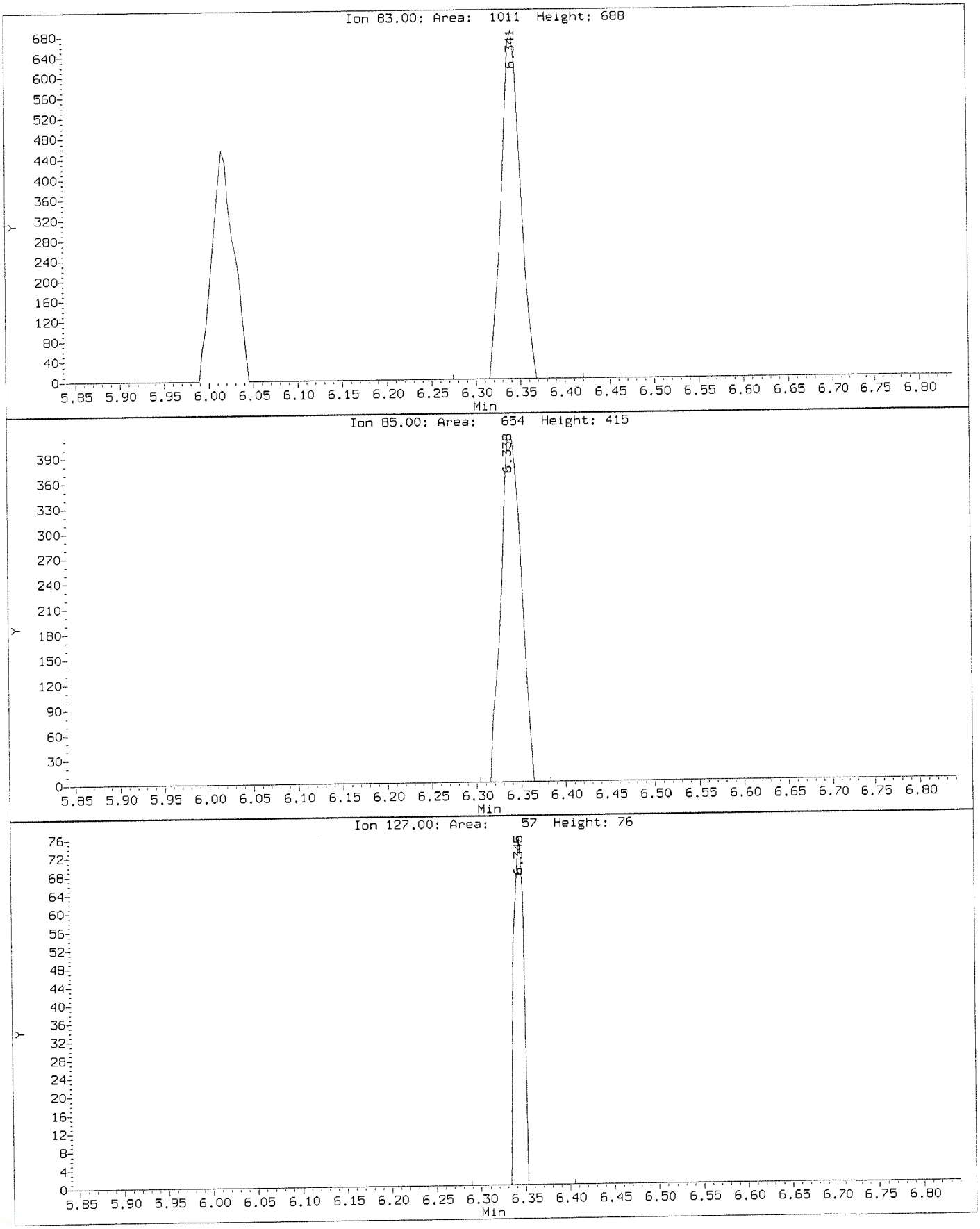






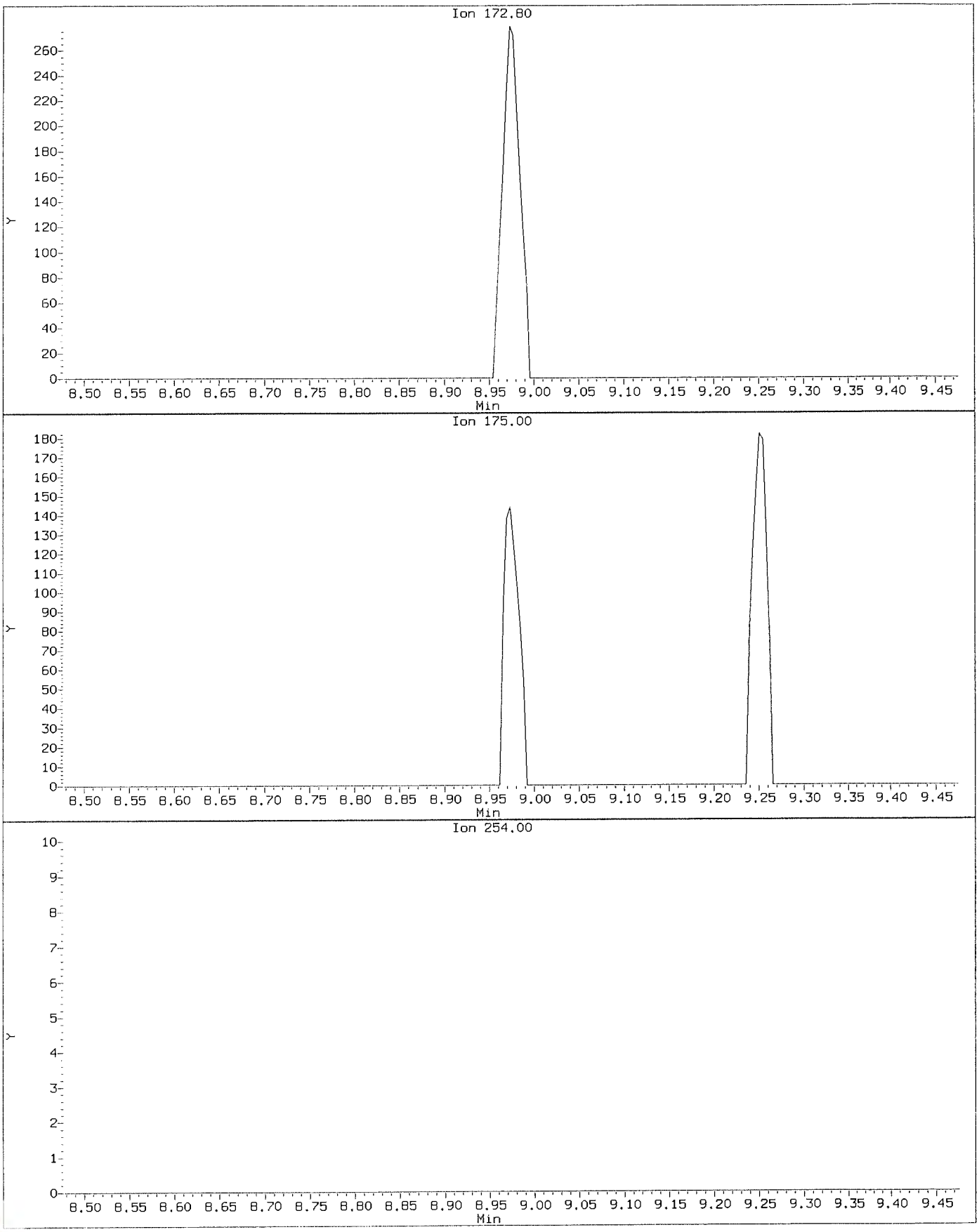
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Client Sample ID: VSTD000.25

Compound: Bromodichloromethane
CAS Number: 75-27-4



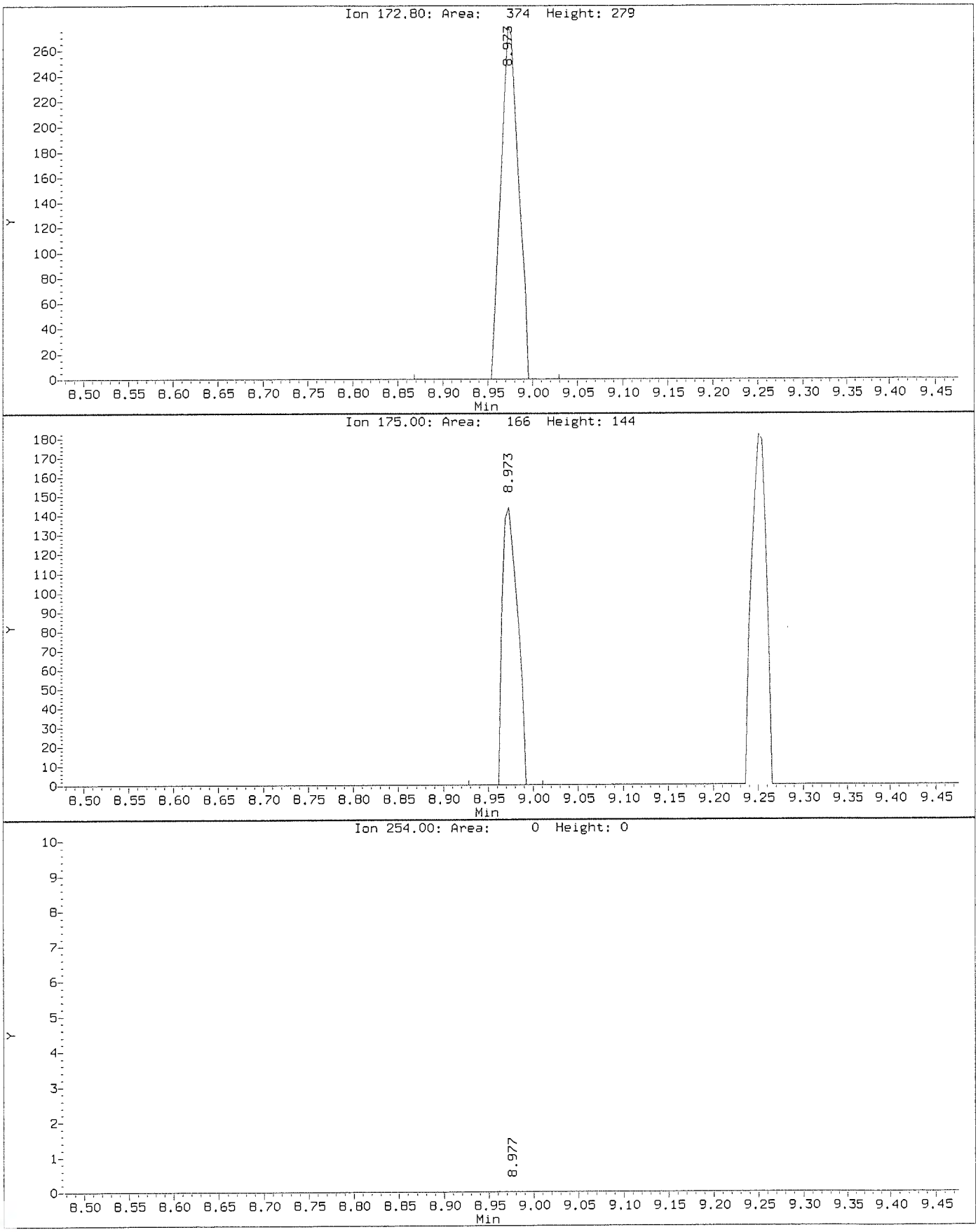
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Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: Bromoform
CAS Number: 75-25-2



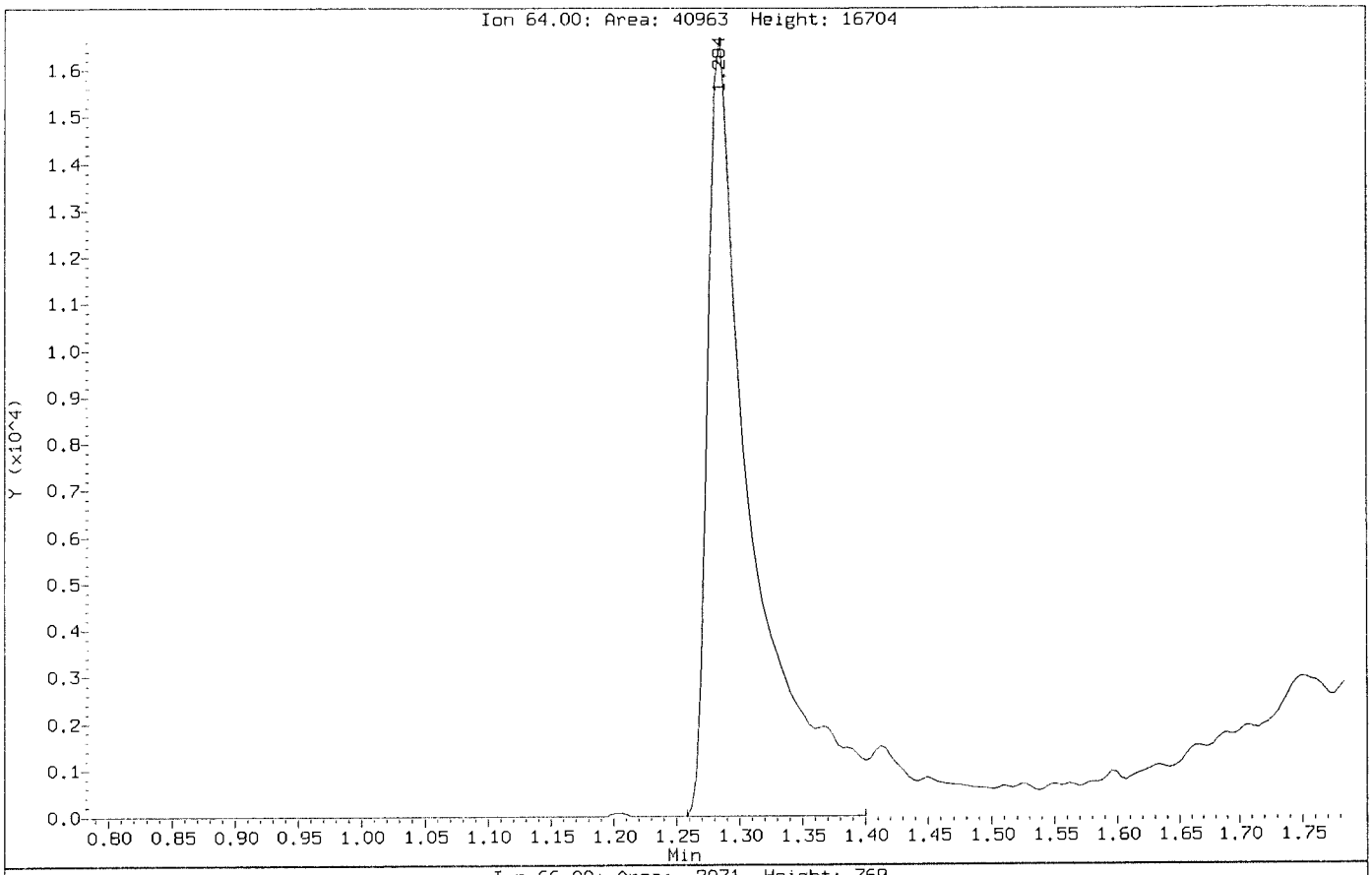
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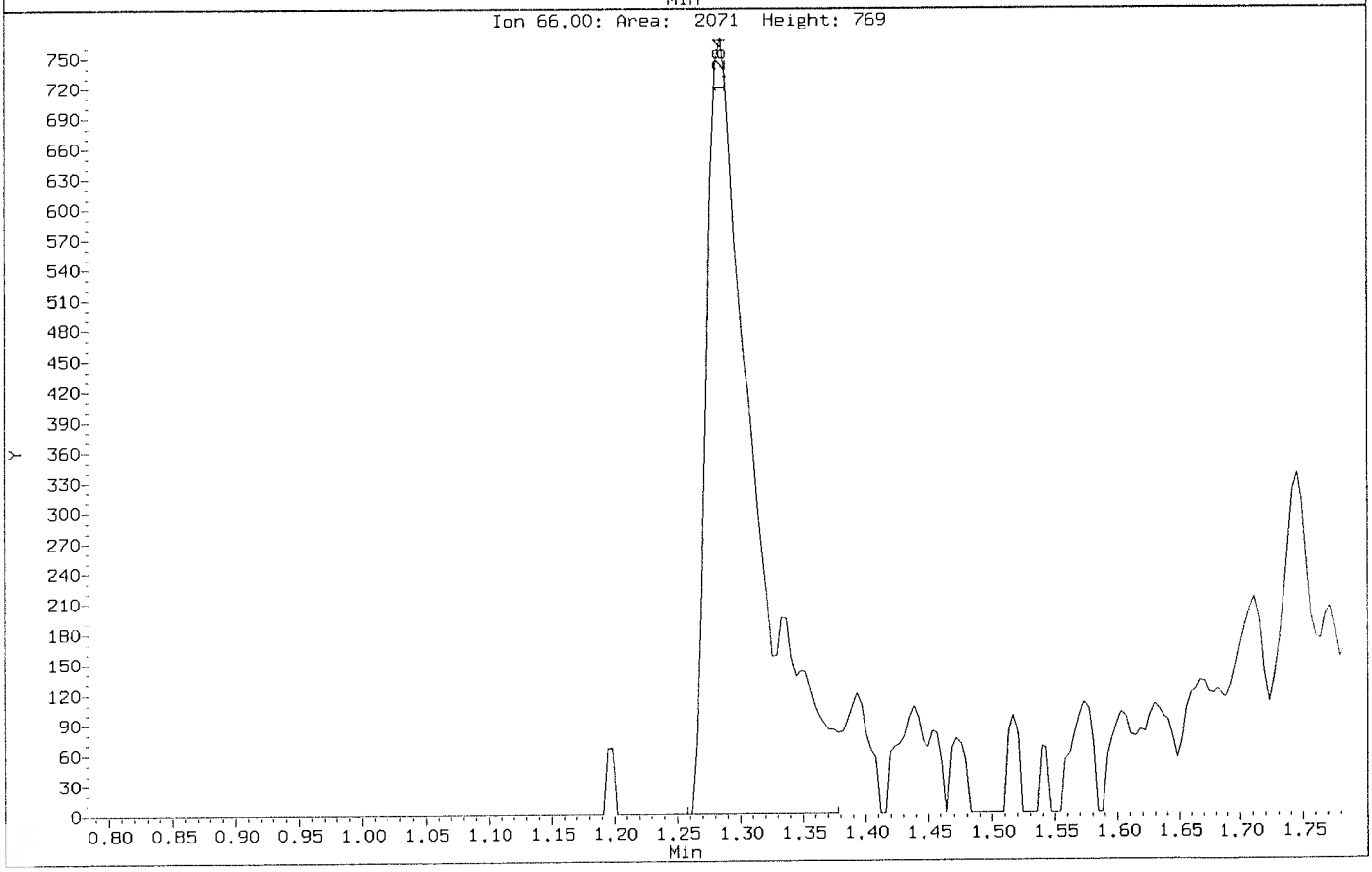
Compound: Bromoform
CAS Number: 75-25-2



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Client Sample ID: VSTD000.25

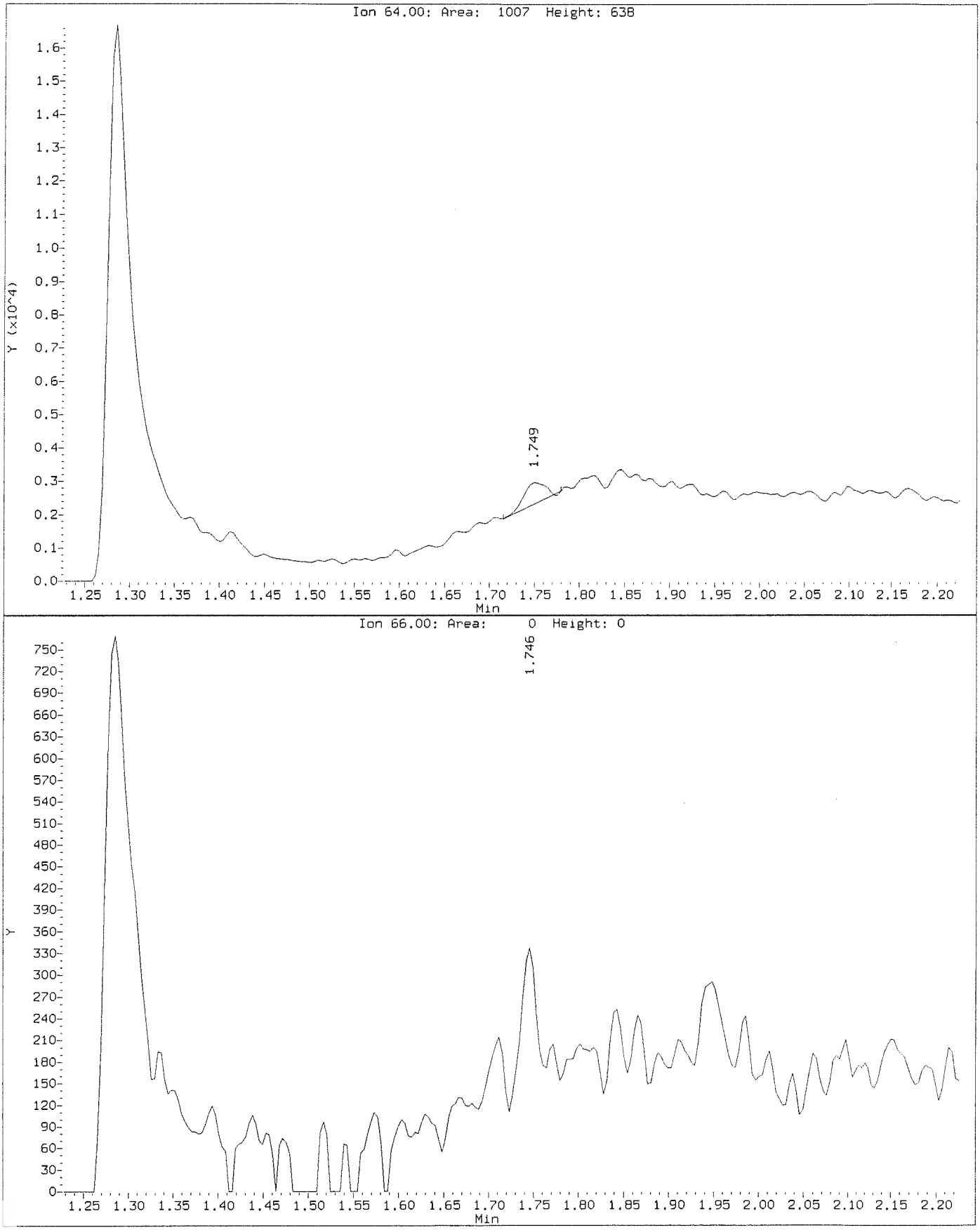
Compound: Chloroethane
CAS Number: 75-00-3





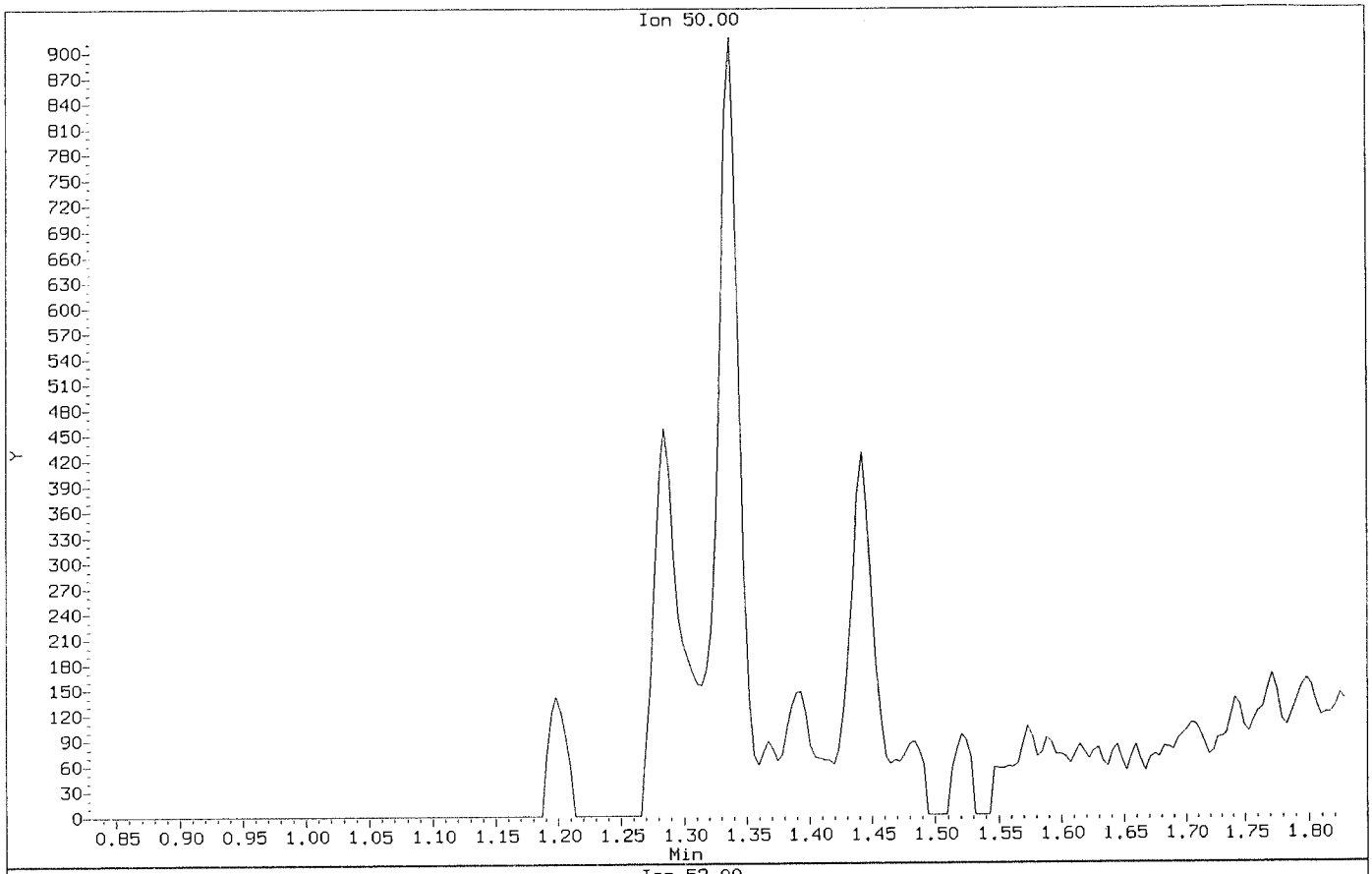
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Client Sample ID: VSTD000.25

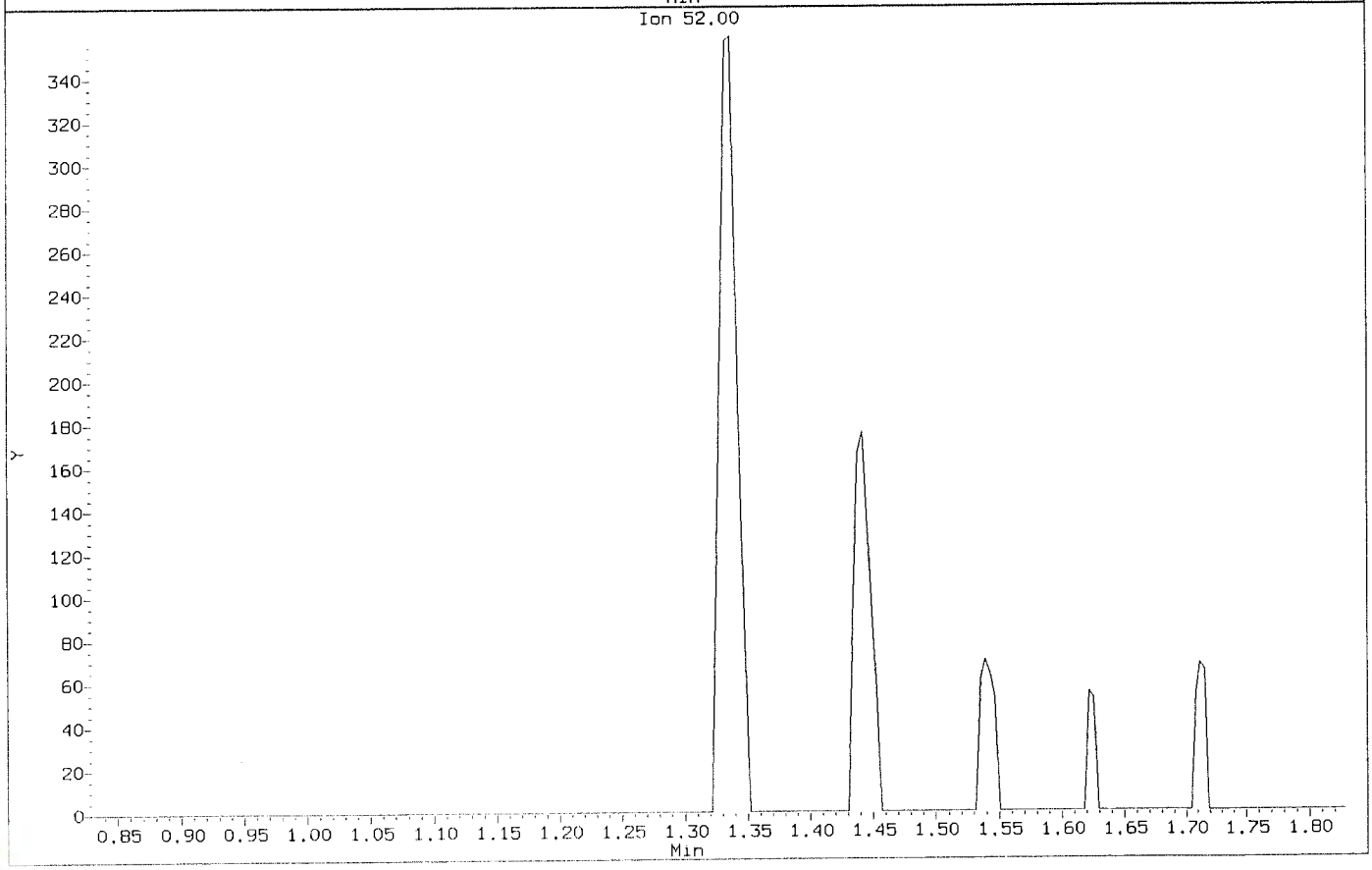
Compound: Chloroethane
CAS Number: 75-00-3



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Client Sample ID: VSTD000.25

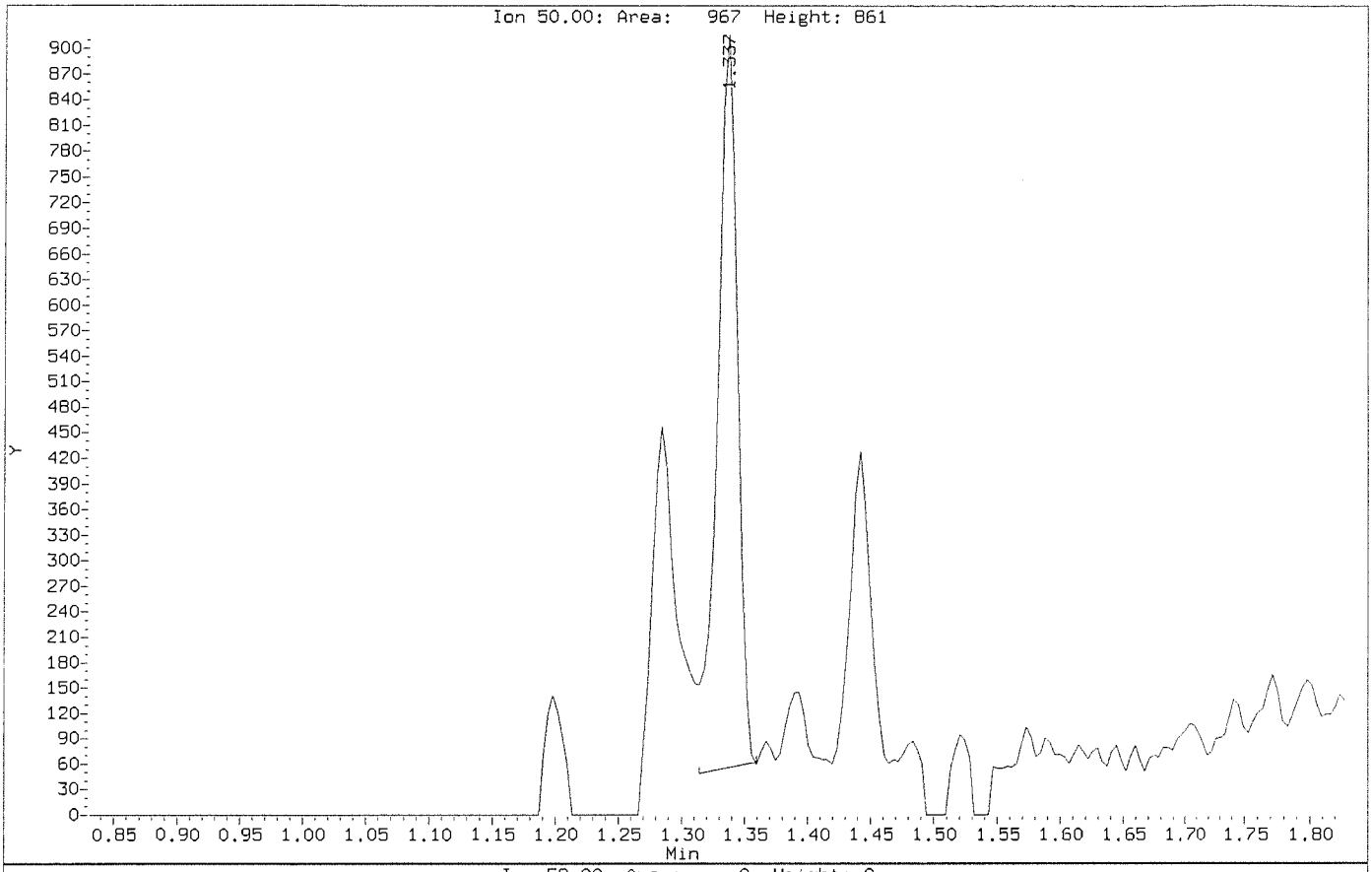
Compound: Chloromethane
CAS Number: 74-87-3

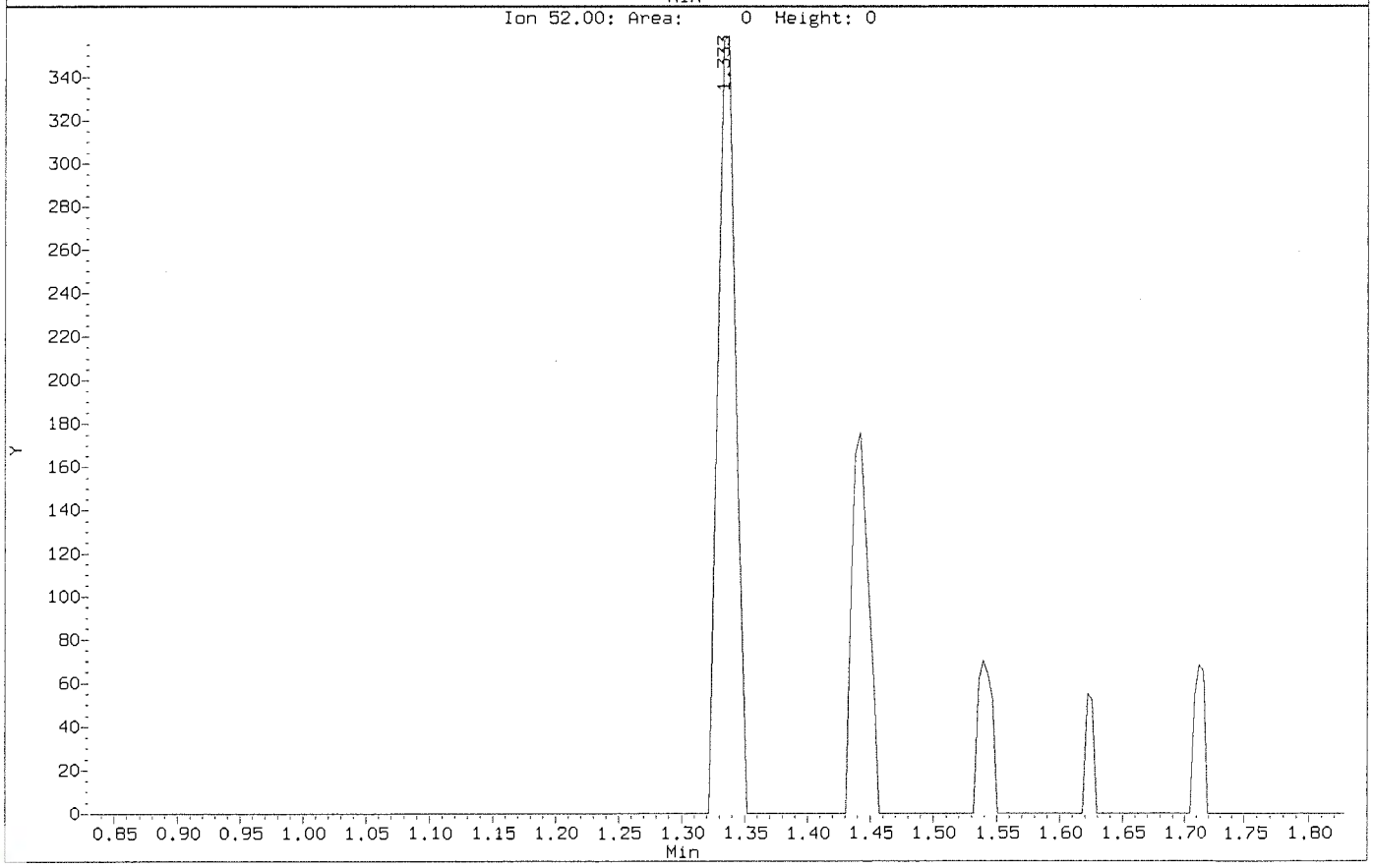




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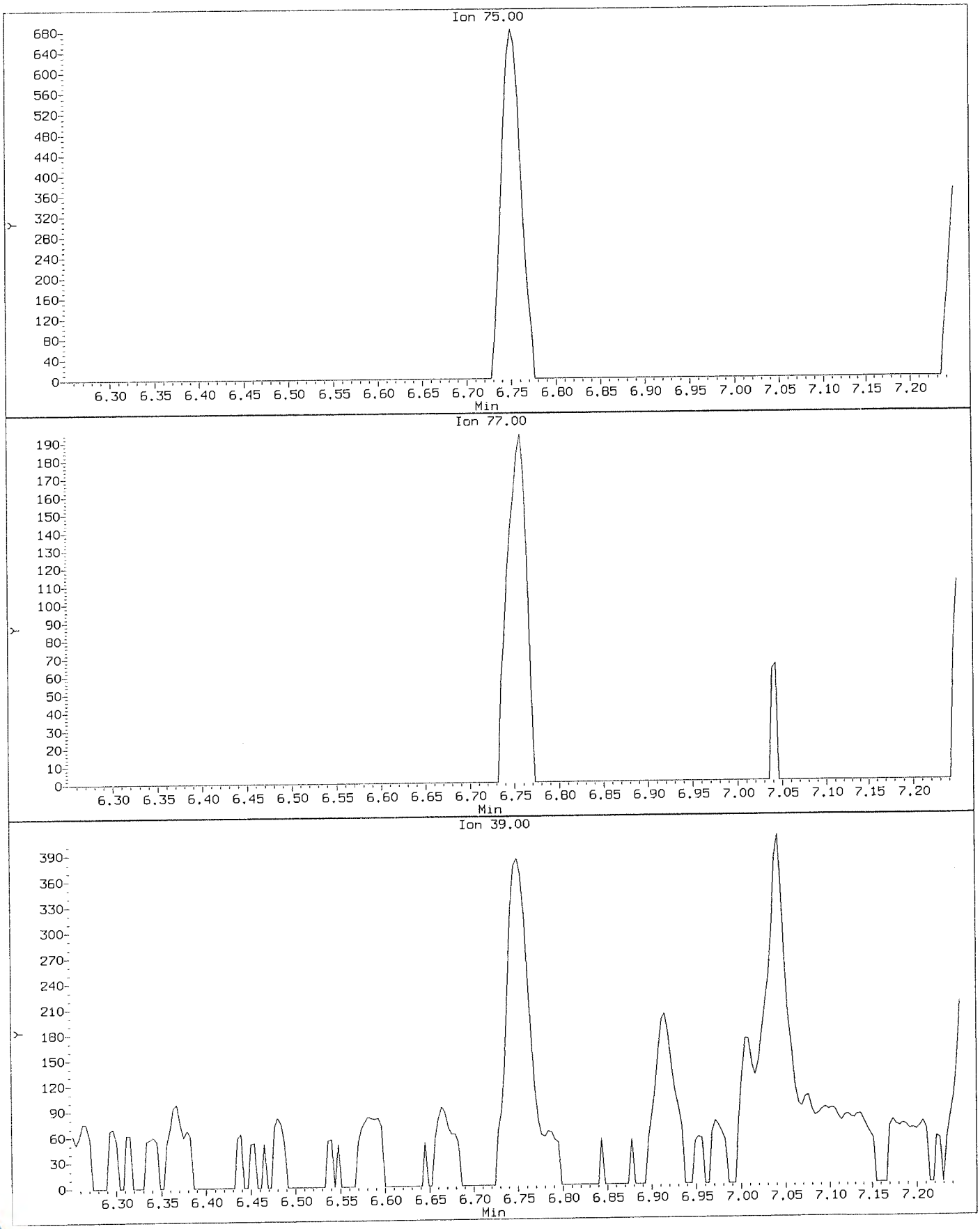
Compound: Chloromethane
CAS Number: 74-87-3





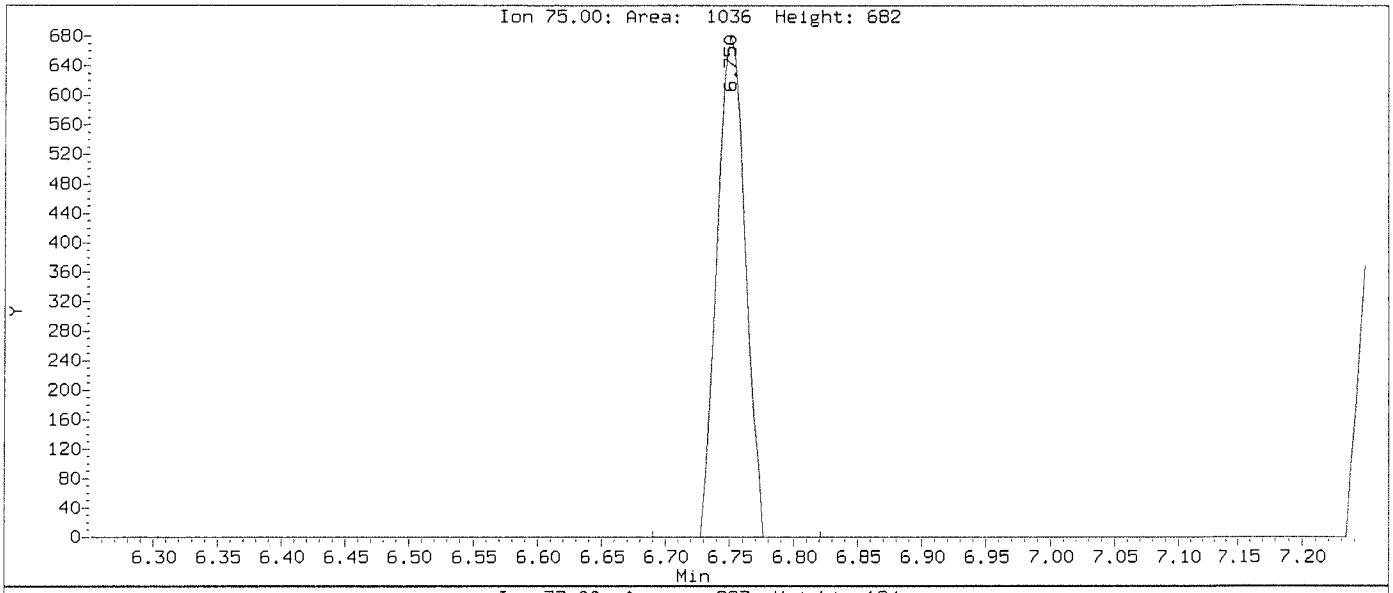
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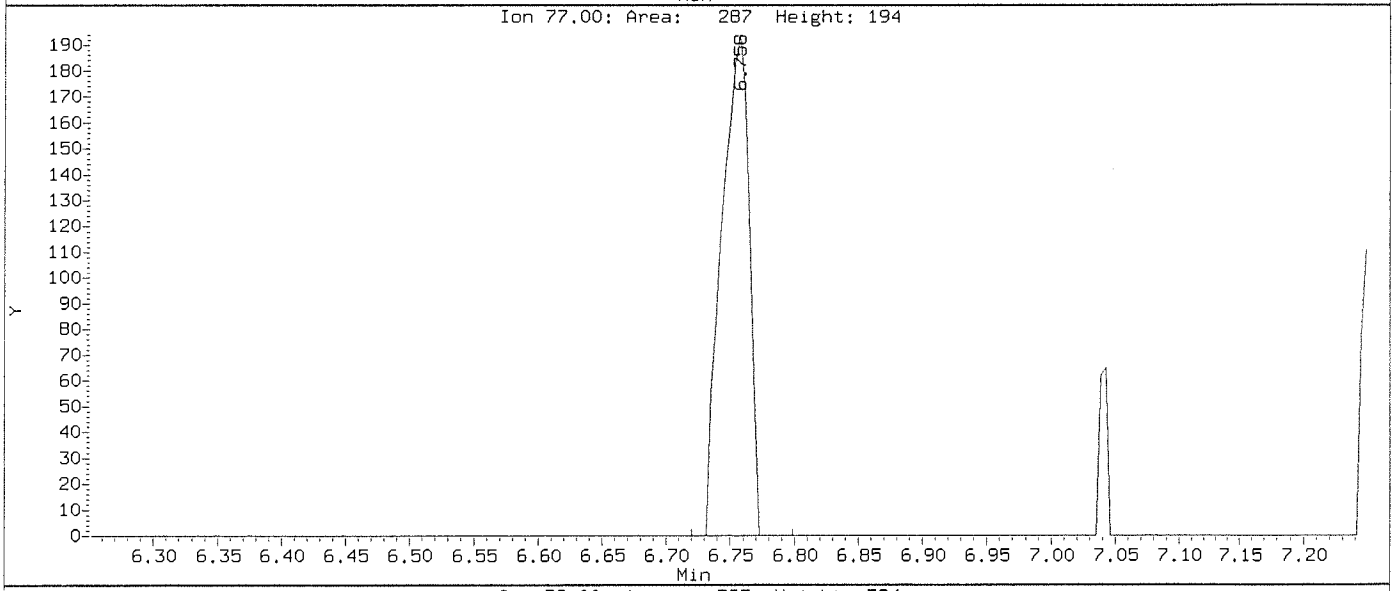
Compound: cis-1,3-Dichloropropene
CAS Number: 10061-01-5

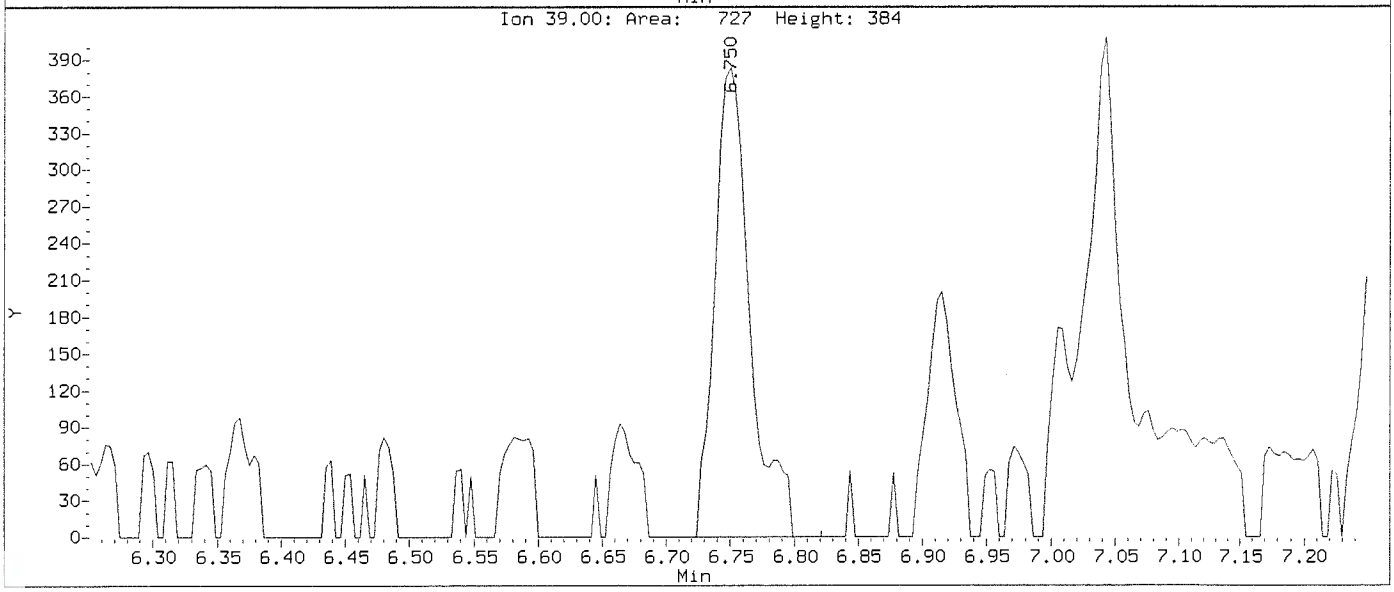


Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111502.D
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: cis-1,3-Dichloropropene
CAS Number: 10061-01-5

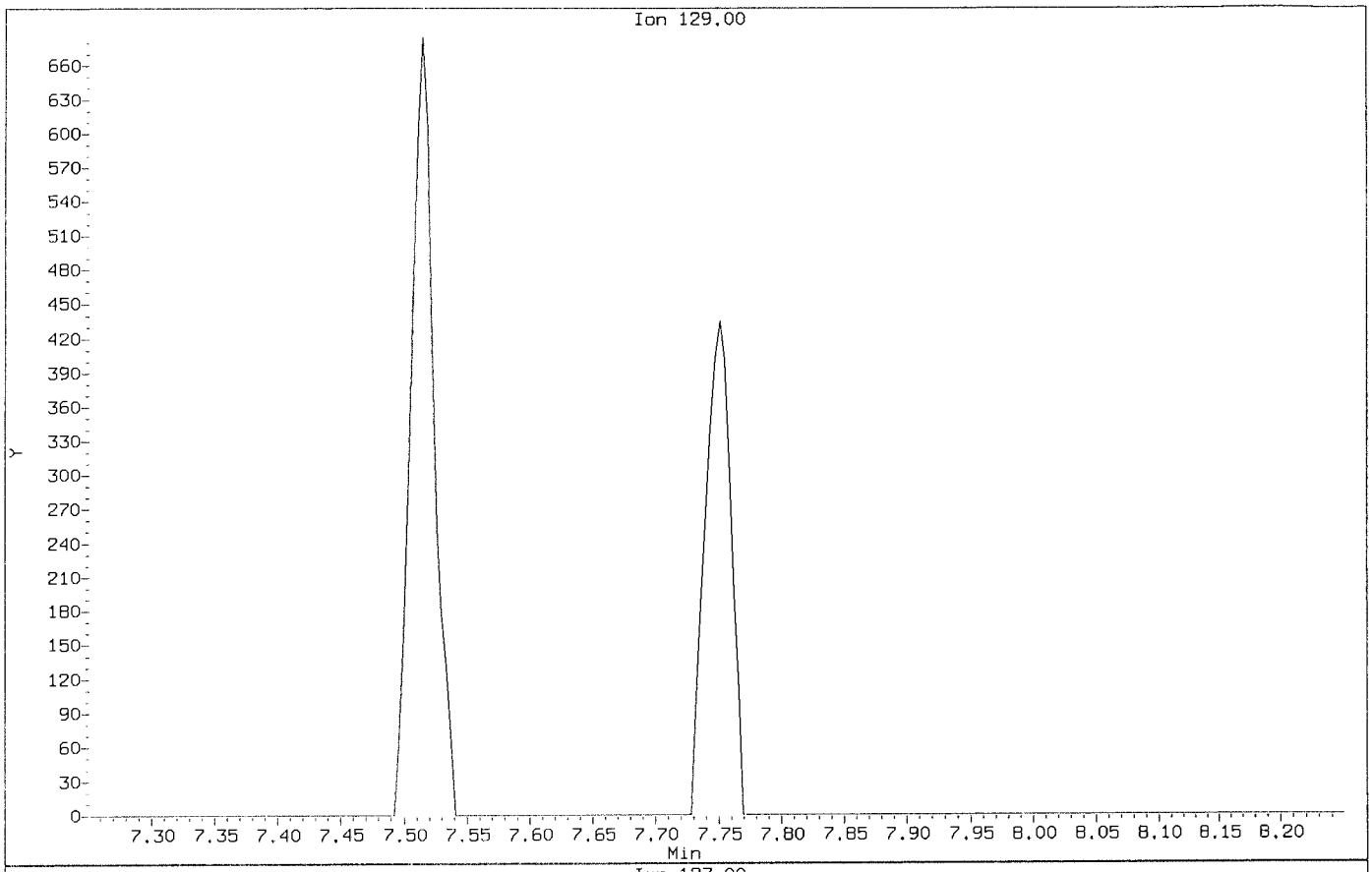


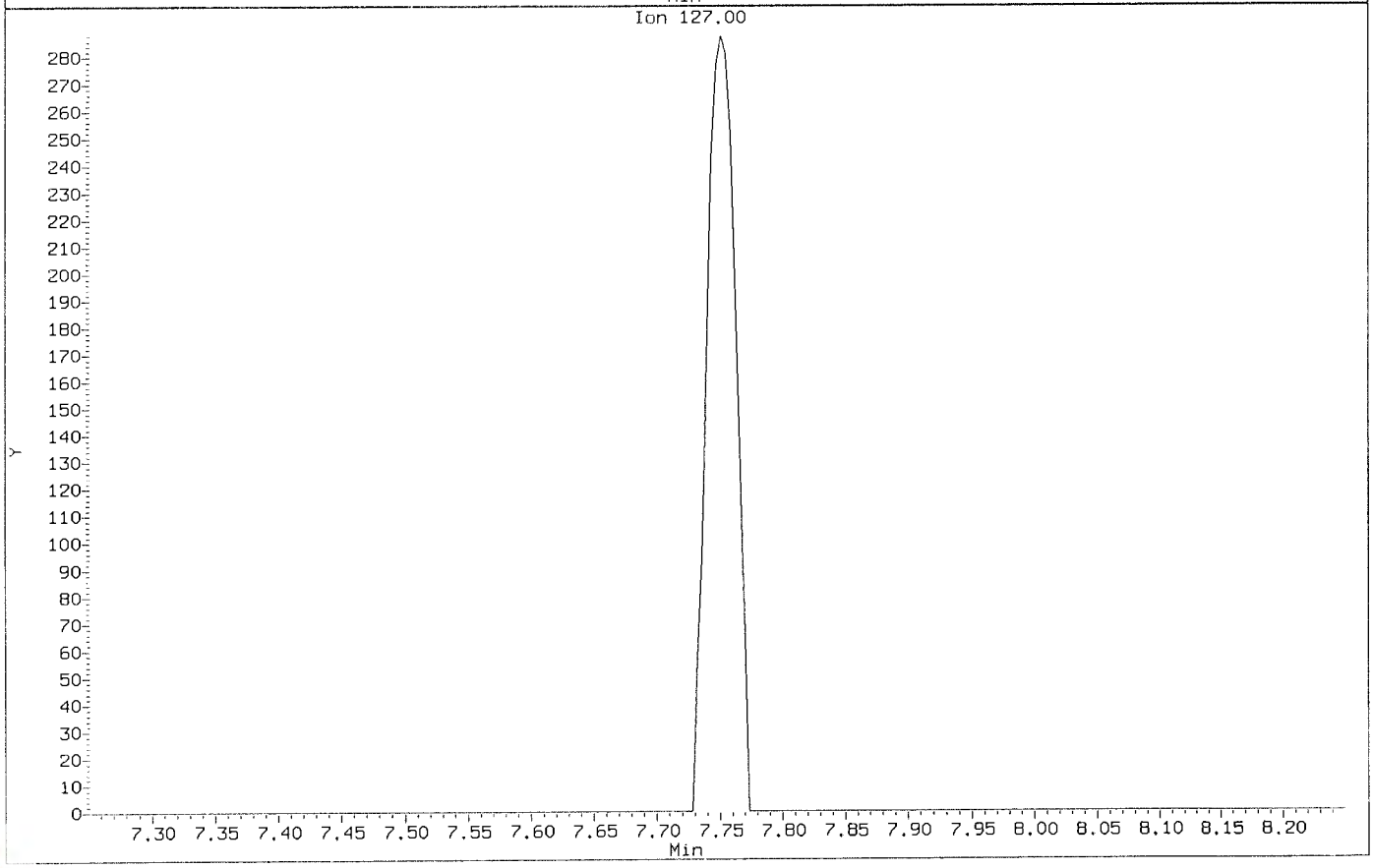




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Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

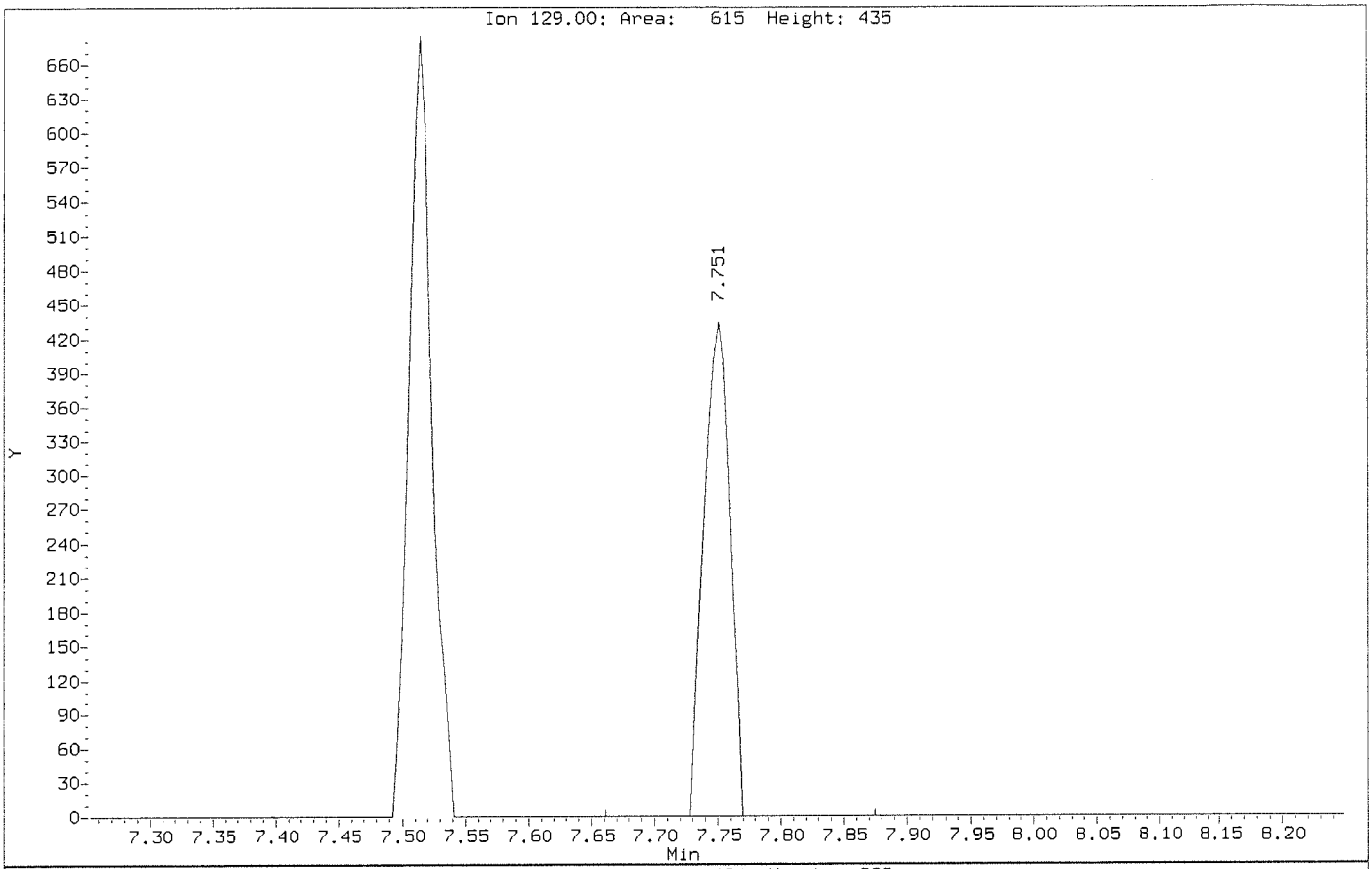
Compound: Dibromochloromethane
CAS Number: 124-48-1

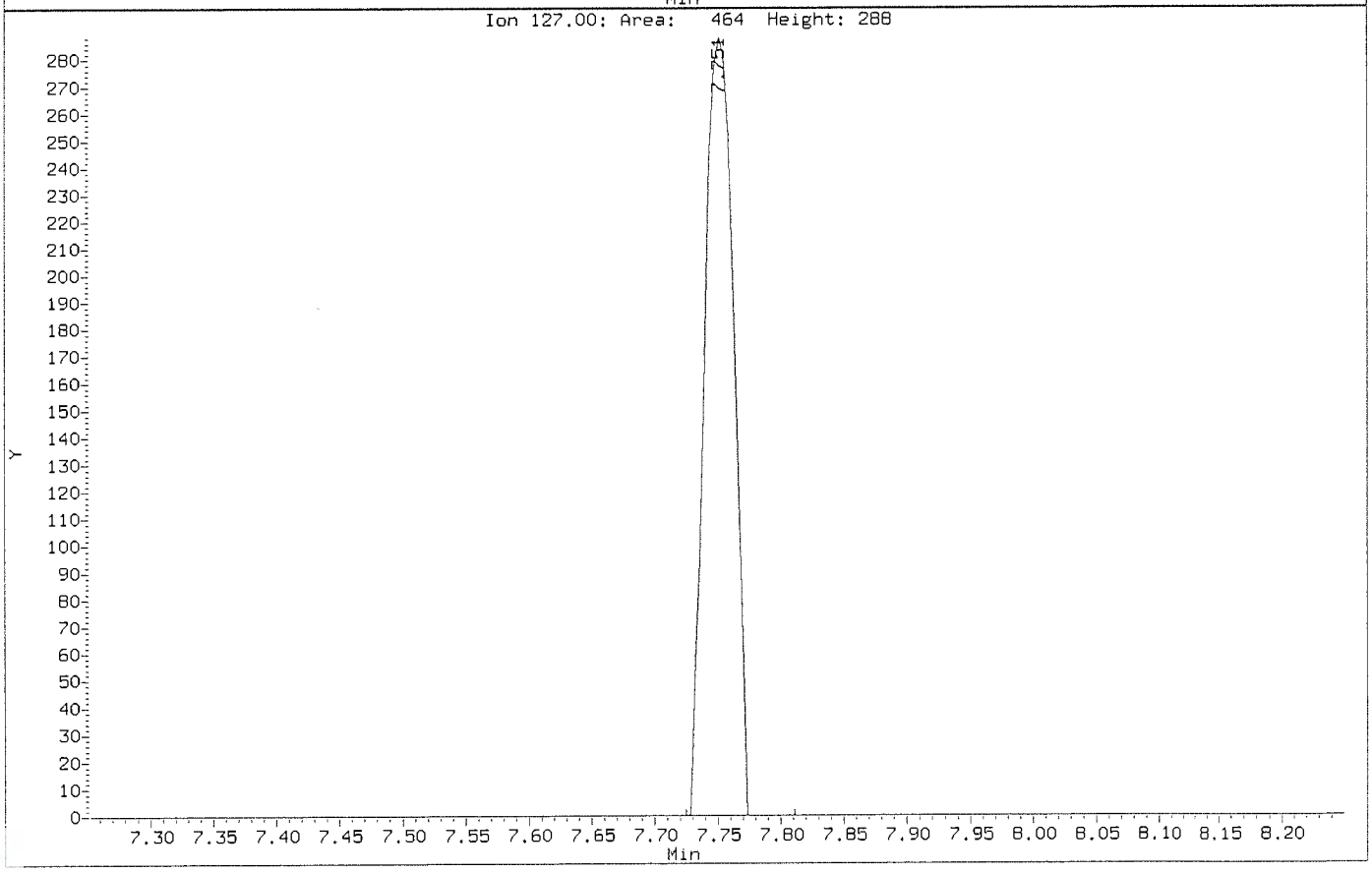




Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111502.D
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

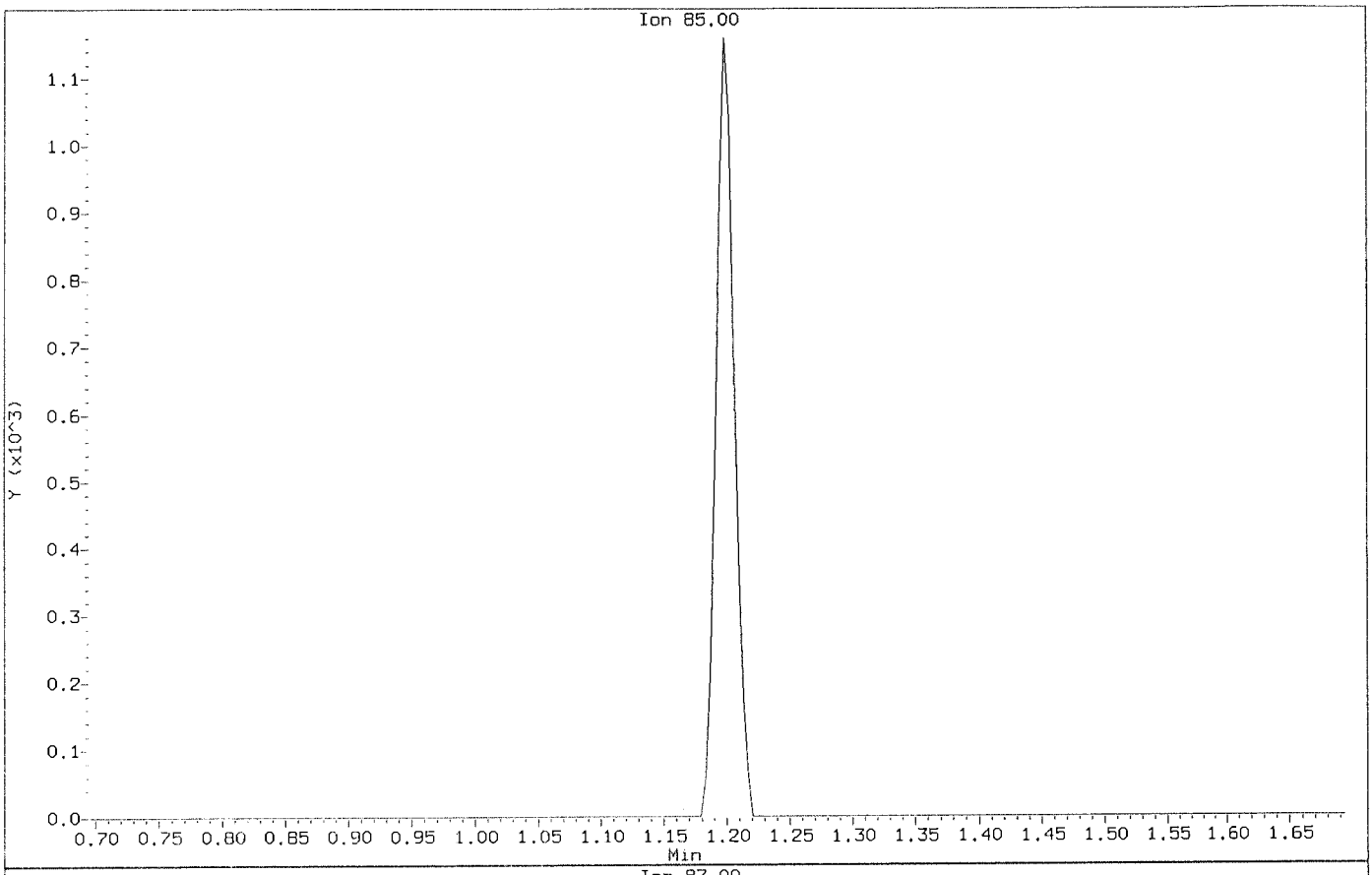
Compound: Dibromochloromethane
CAS Number: 124-48-1

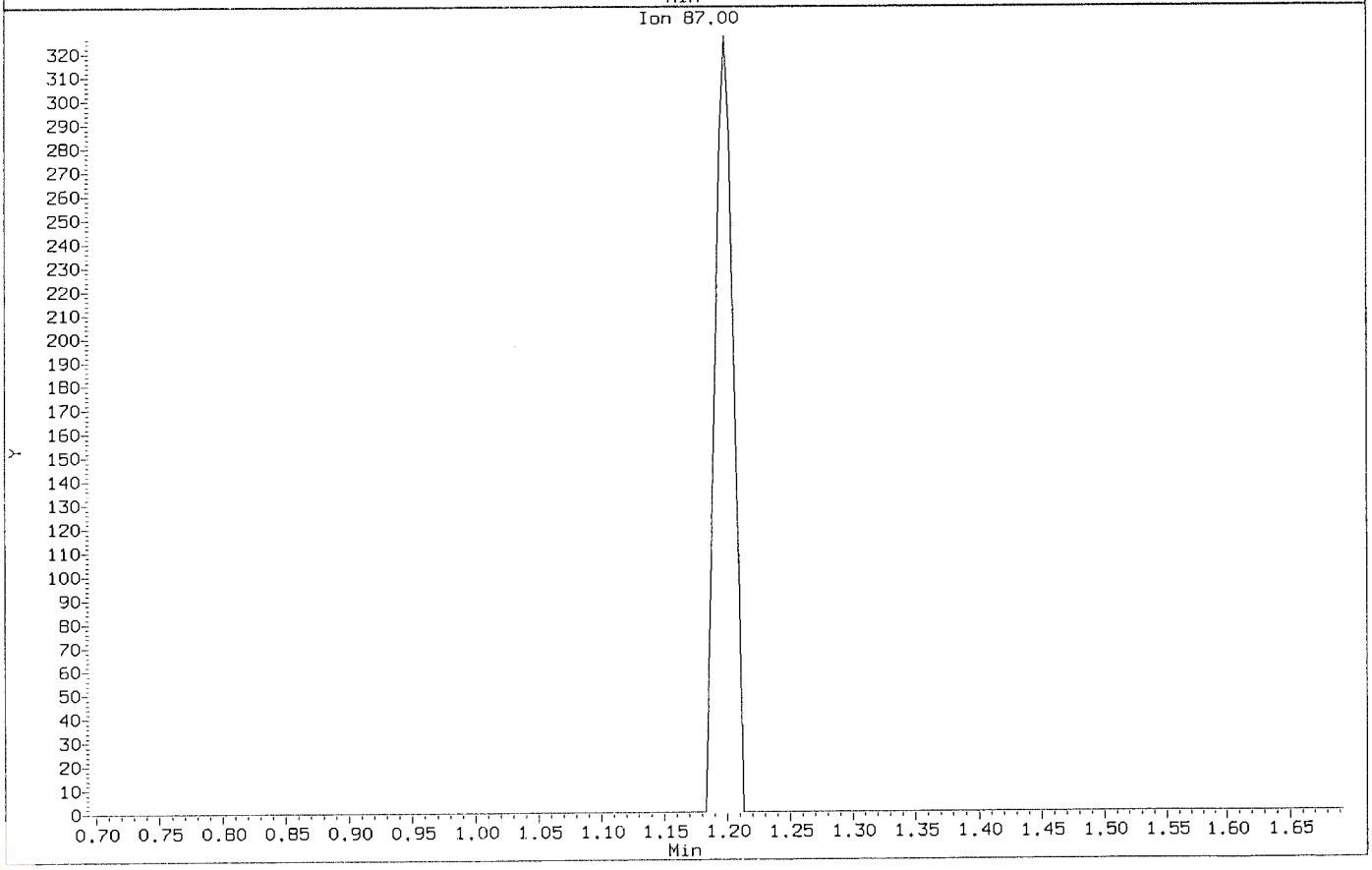




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Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

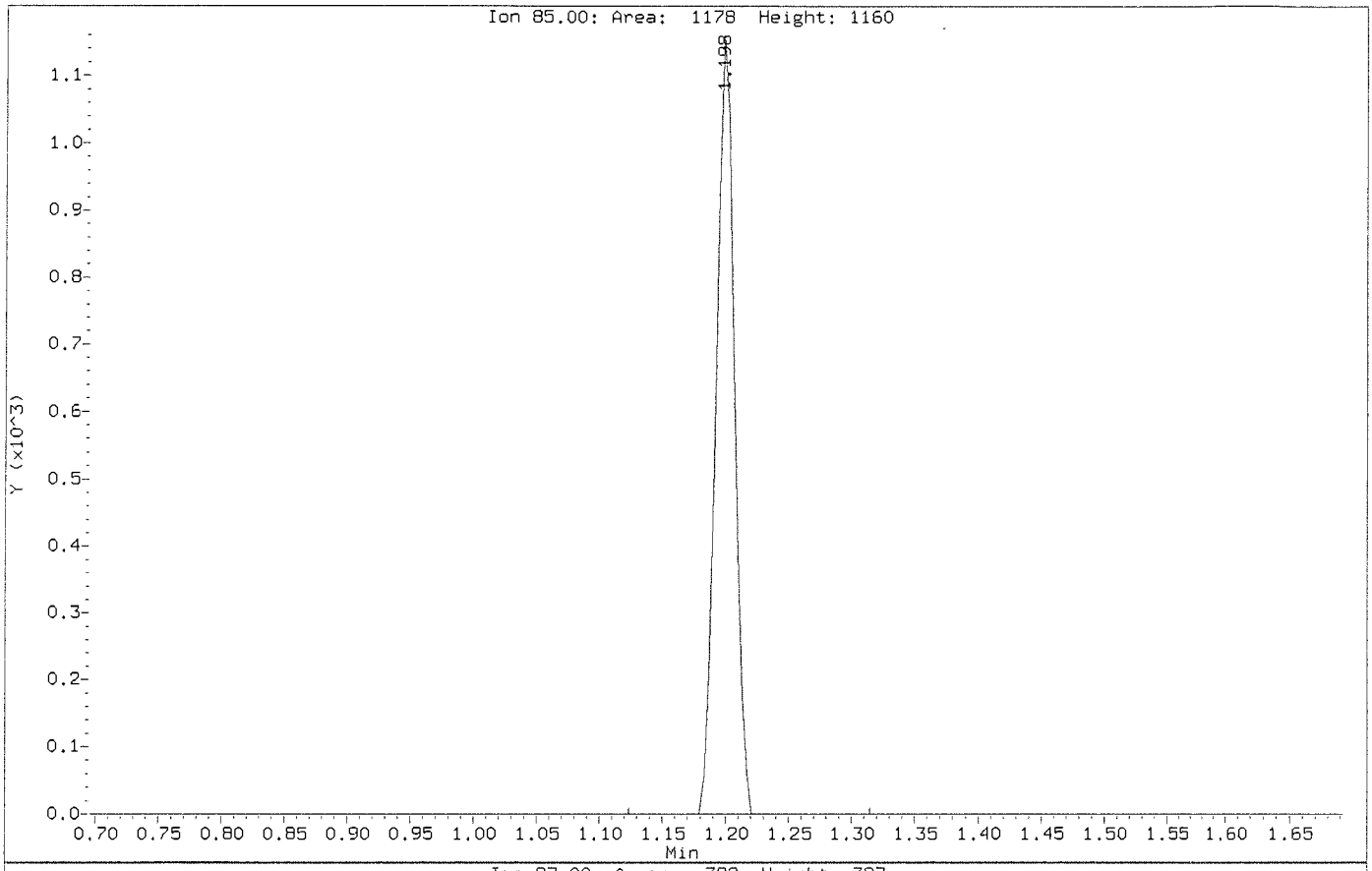
Compound: Dichlorodifluoromethane
CAS Number: 75-71-8

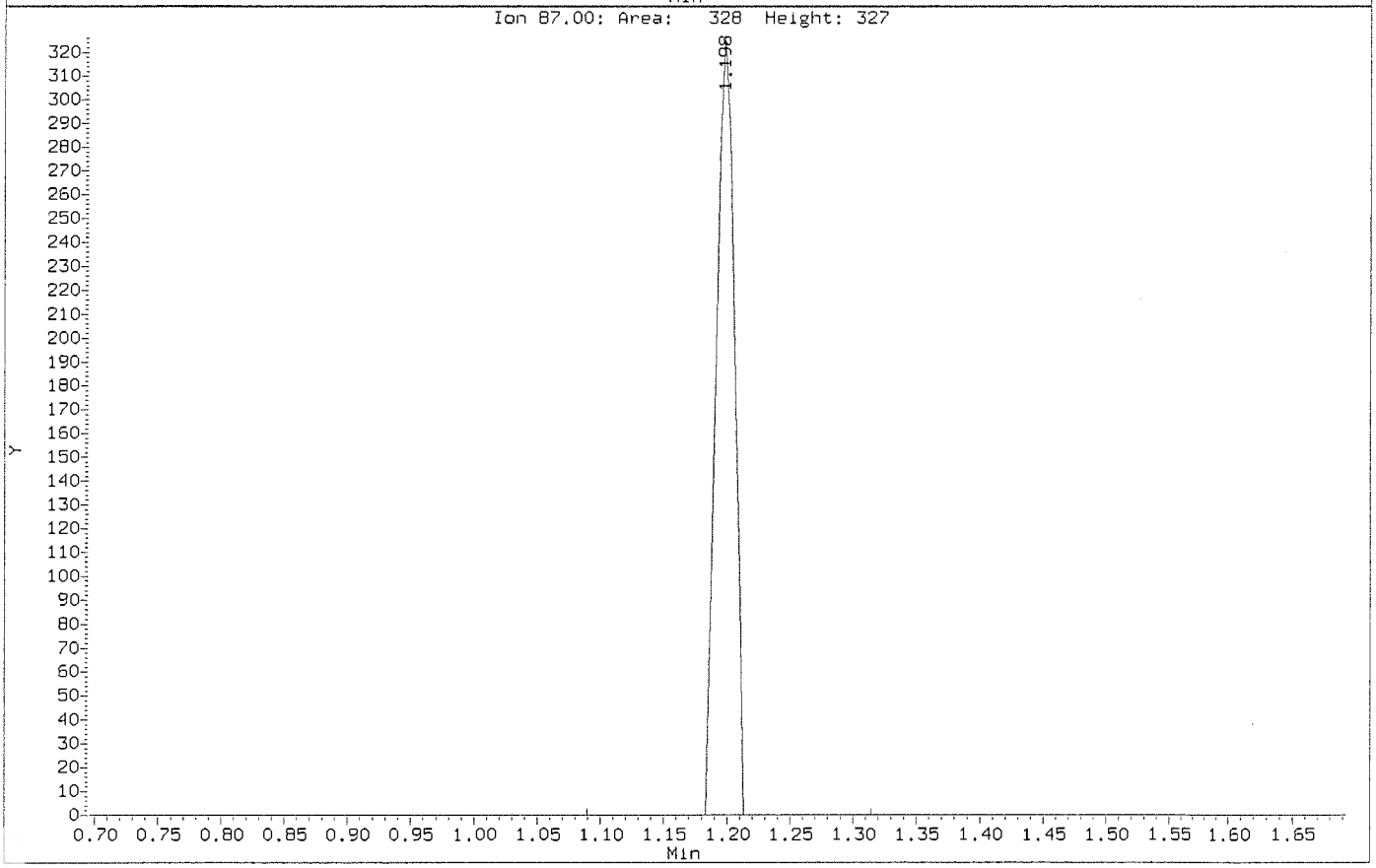




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Client Sample ID: VSTD000.25

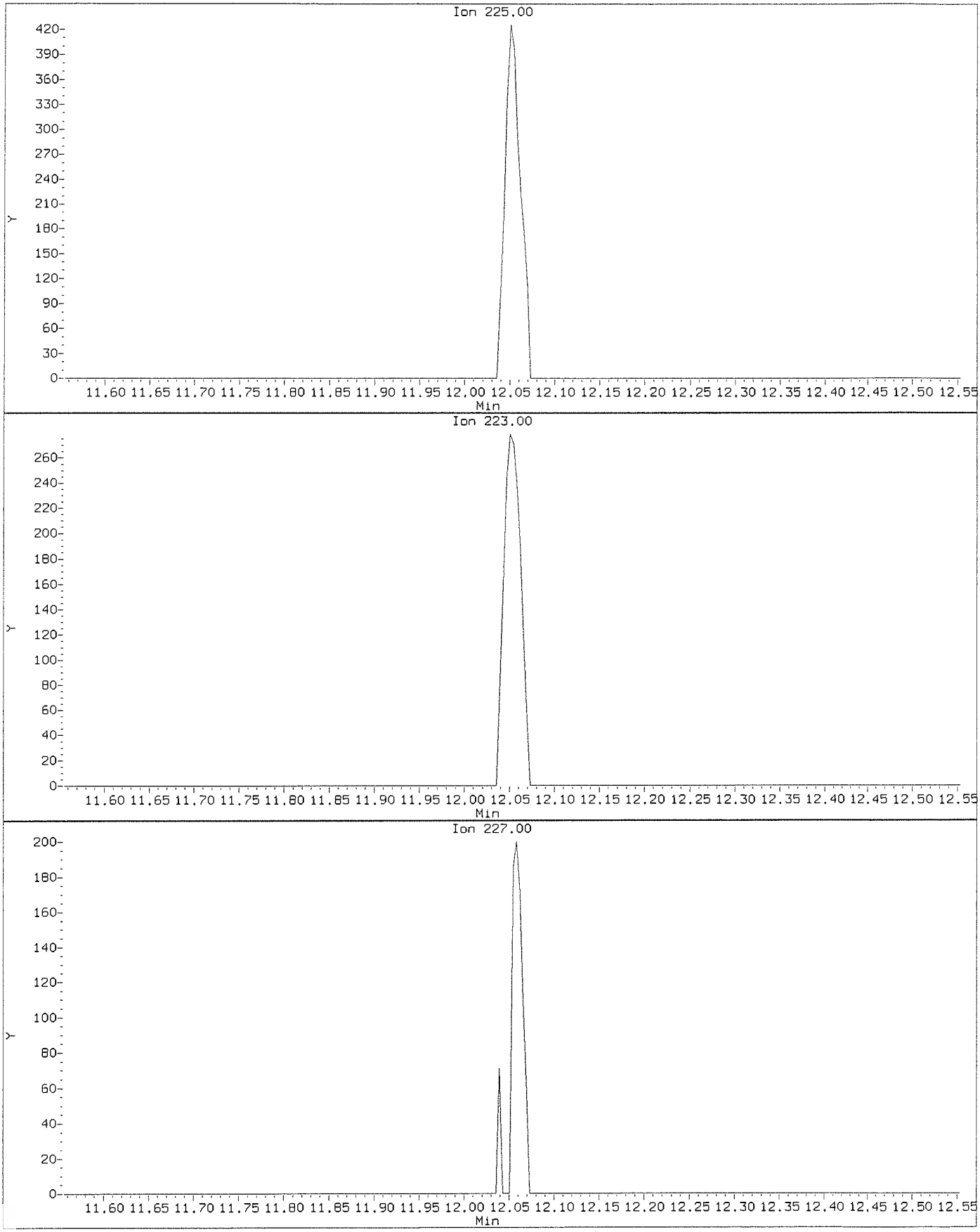
Compound: Dichlorodifluoromethane
CAS Number: 75-71-8





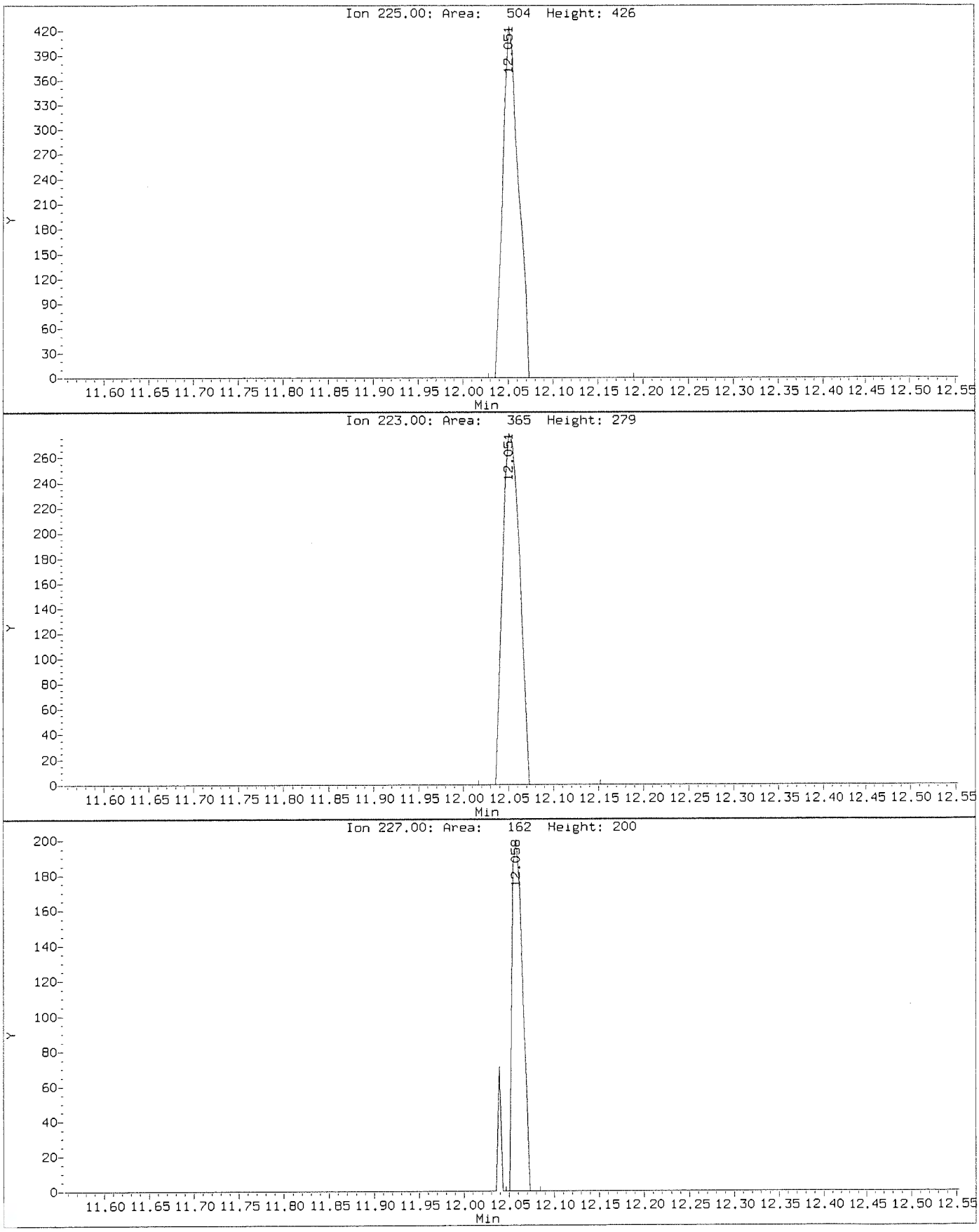
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Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: Hexachlorobutadiene
CAS Number: 87-68-3



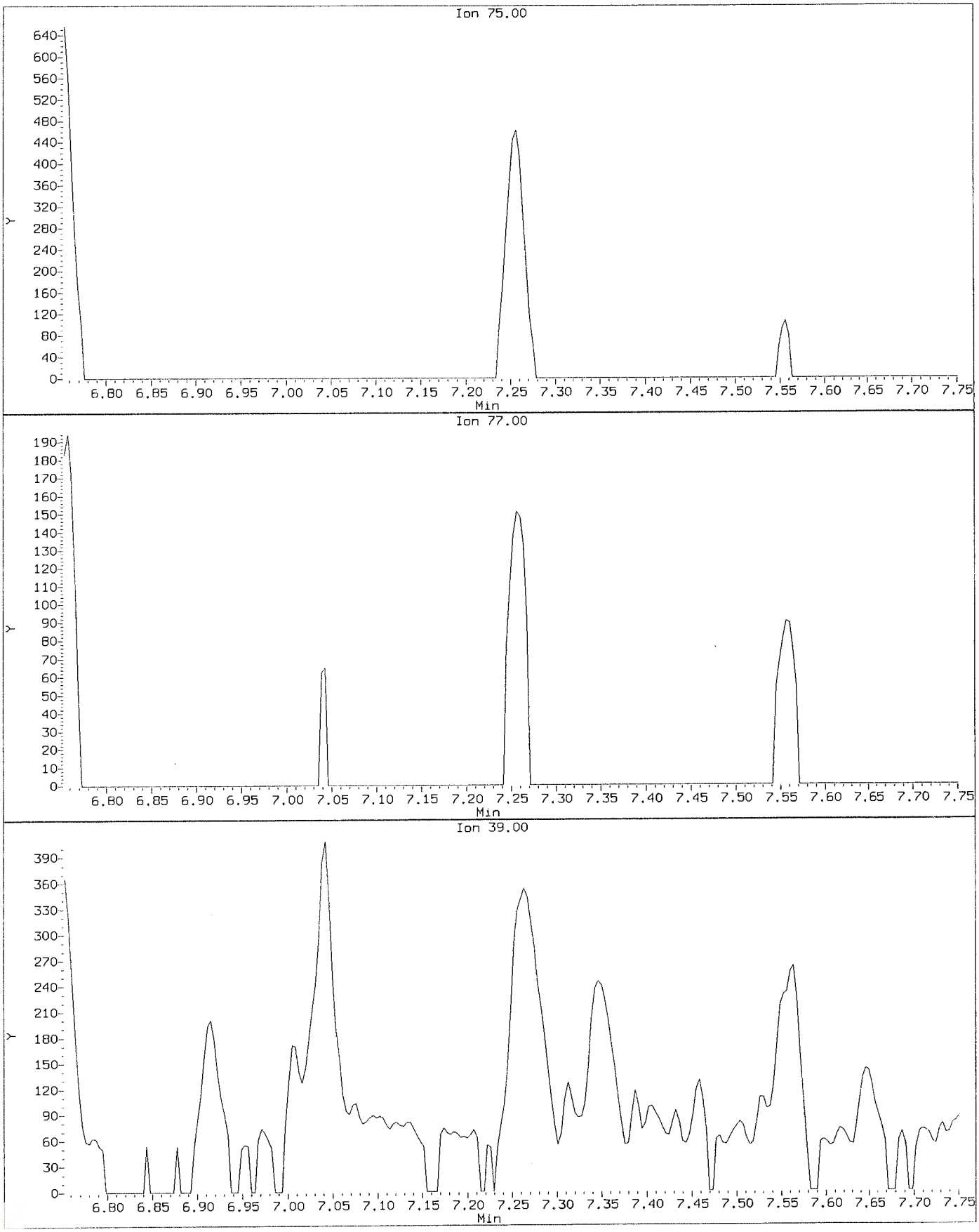
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Client Sample ID: VSTD000.25

Compound: Hexachlorobutadiene
CAS Number: 87-68-3



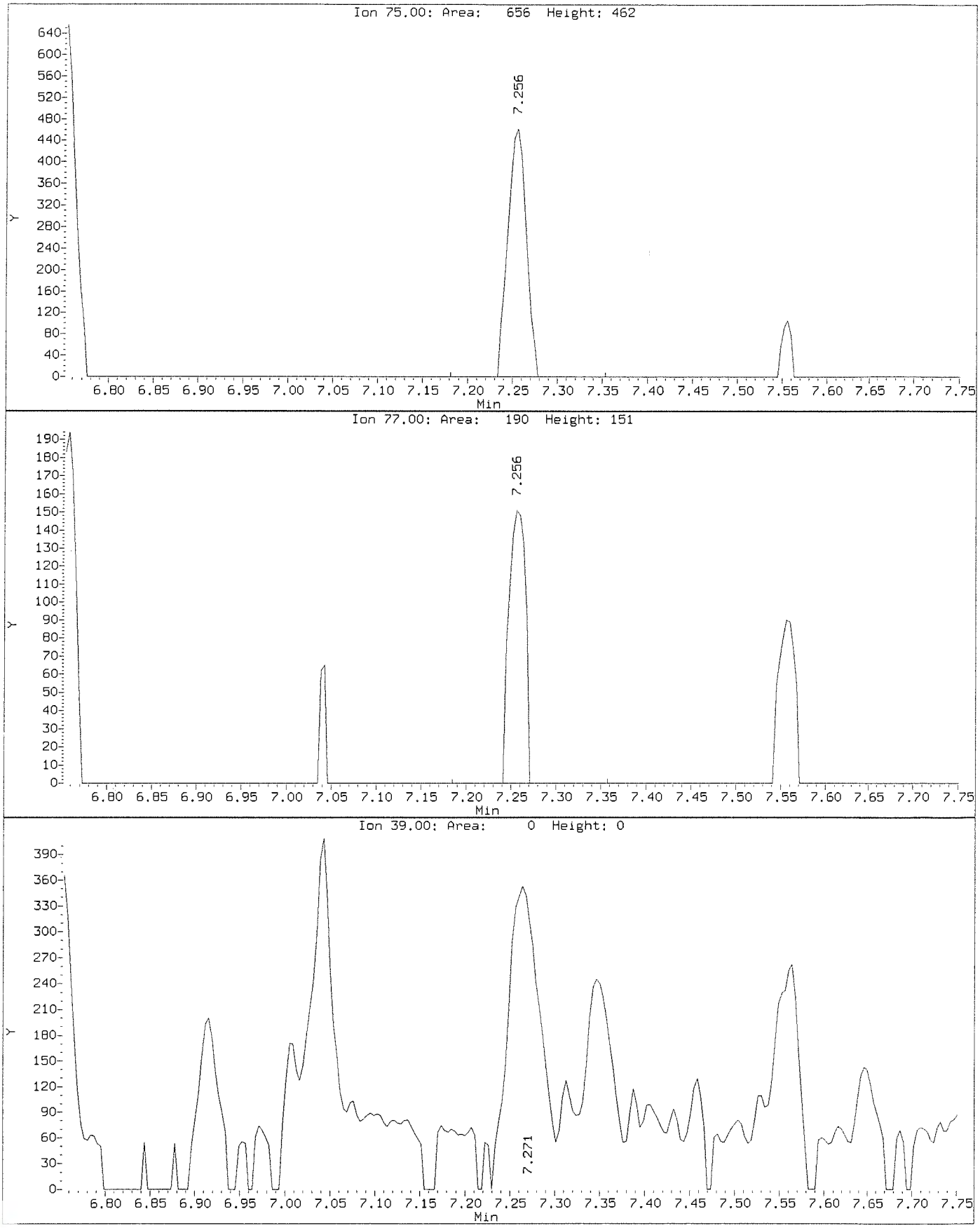
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Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: trans-1,3-Dichloropropene
CAS Number: 10061-02-6



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111502.D
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: trans-1,3-Dichloropropene
CAS Number: 10061-02-6



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111503.D Page 1
Report Date: 20-Dec-2021 15:39

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111503.D
Lab Smp Id: VSTD000.5 Client Smp ID: VSTD000.5
Inj Date : 15-NOV-2021 14:36
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD000.5;VSTD000.5;1;2;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211115.b\8260C.m
Meth Date : 20-Dec-2021 15:39 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 13:52 Cal File: U111502.D
Als bottle: 4 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

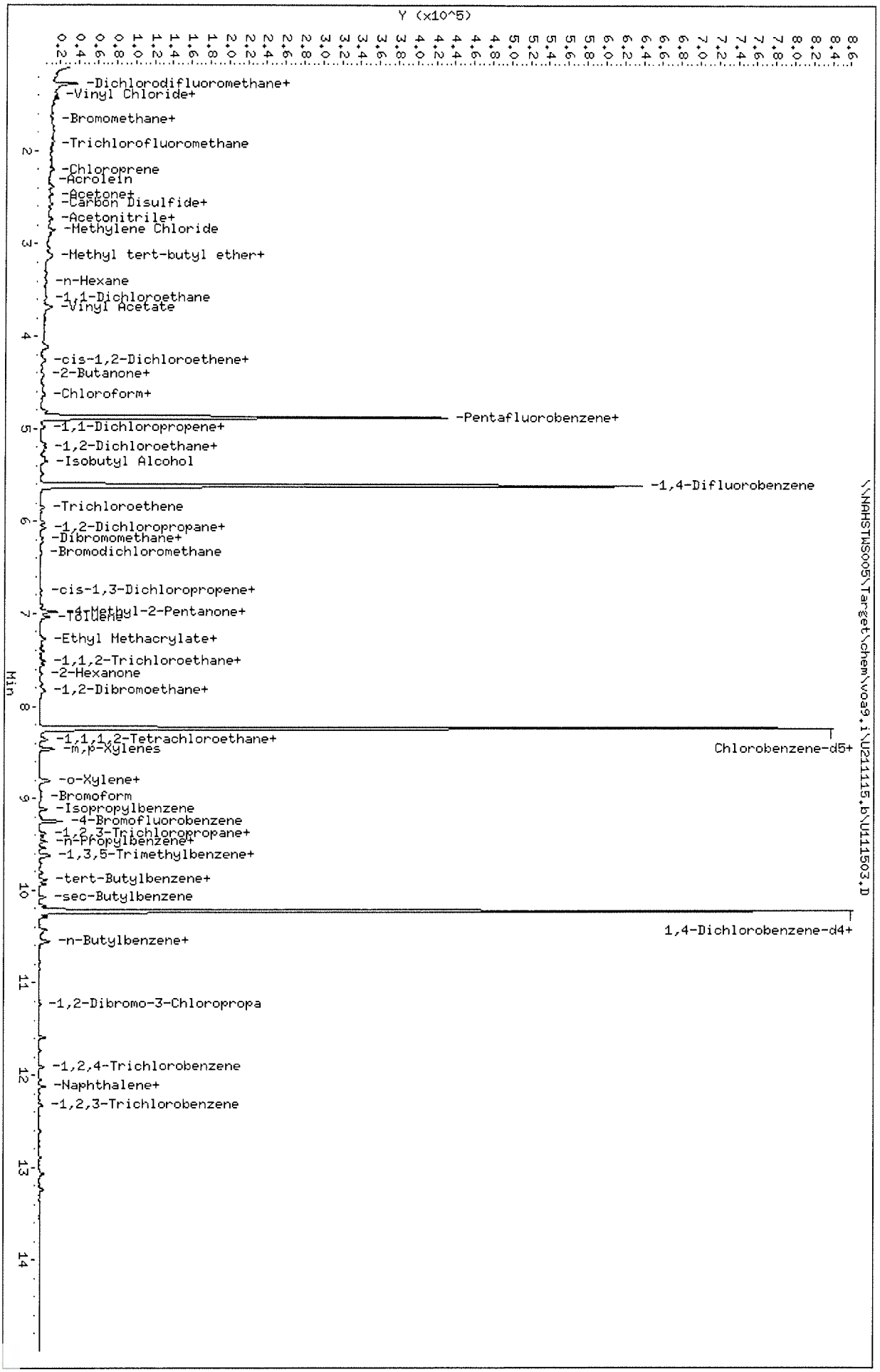
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.879	4.879	(1.000)	271182	50.0000	
* 36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	470948	50.0000	
* 47 Chlorobenzene-d5	117	8.238	8.238	(1.000)	422791	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	207538	50.0000	
$ 30 Dibromofluoromethane	113	4.815	4.815	(0.987)	1516	0.50000	(aM)
$ 35 1,2-Dichloroethane-d4	65	5.164	5.164	(1.058)	1948	0.50000	(aM)
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	6356	0.50000	0.57(aM)
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	3705	0.50000	(aM)
60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	803	0.50000	1.09(a)
31 1,1,1-Trichloroethane	97	4.808	4.808	(0.985)	1478	0.50000	0.37(a)
68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	1769	0.50000	0.40(aM)
53 1,1,2-Trichloroethane	83	7.413	7.413	(0.900)	1069	0.50000	0.42(a)
22 1,1-Dichloroethane	63	3.582	3.582	(0.734)	2083	0.50000	0.43(Ta)
11 1,1-Dichloroethene	96	2.382	2.382	(0.488)	1015	0.50000	0.41(aM)
32 1,1-Dichloropropene	75	4.984	4.984	(0.888)	1529	0.50000	0.39(a)
93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	1423	0.50000	0.38(aM)
71 1,2,3-Trichloropropane	75	9.415	9.415	(0.921)	1725	0.50000	0.40(a)
90 1,2,4-Trichlorobenzene	180	11.915	11.915	(1.165)	1643	0.50000	0.43(aM)
79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	4113	0.50000	0.39(a)
89 1,2-Dibromo-3-Chloropropane	155	11.225	11.225	(1.098)	40	0.50000	2.48(aM)
57 1,2-Dibromoethane	107	7.840	7.840	(0.952)	1142	0.50000	0.37(a)
88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	2336	0.50000	0.39(a)

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111503.D Page 2
Report Date: 20-Dec-2021 15:39

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.246	(0.935)	1755	0.50000	0.41(aM)
42	1,2-Dichloropropane	63	6.075	6.075	(1.082)	1164	0.50000	0.39(a)
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	4412	0.50000	0.43(a)
83	1,3-Dichlorobenzene	146	10.172	10.172	(0.995)	2678	0.50000	0.44(a)
54	1,3-Dichloropropane	76	7.555	7.555	(0.917)	2128	0.50000	0.40(a)
84	1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	2568	0.50000	0.41(a)
26	2,2-Dichloropropane	77	4.257	4.257	(0.872)	1144	0.50000	0.41(aM)
24	2-Butanone	43	4.350	4.350	(0.892)	1576	1.00000	1.11(aM)
76	2-Chlorotoluene	91	9.539	9.539	(0.933)	3715	0.50000	0.41(a)
52	2-Hexanone	43	7.653	7.653	(0.929)	1404	1.00000	0.69(aH)
77	4-Chlorotoluene	91	9.632	9.632	(0.942)	4404	0.50000	0.42(a)
82	p-Isopropyltoluene	119	10.202	10.202	(0.998)	3984	0.50000	0.39(a)
45	4-Methyl-2-Pentanone	43	6.914	6.914	(0.839)	2609	1.00000	0.85(a)
10	Acetone	43	2.469	2.469	(0.506)	3031	1.00000	(a)
37	Benzene	78	5.201	5.201	(0.927)	5187	0.50000	0.43(a)
74	Bromobenzene	156	9.374	9.374	(0.917)	1189	0.50000	0.36(a)
29	Bromochloromethane	128	4.542	4.542	(0.931)	602	0.50000	0.39(a)
39	Bromodichloromethane	83	6.341	6.341	(1.130)	1201	0.50000	1.34(aM)
66	Bromoform	173	8.976	8.976	(1.090)	450	0.50000	1.65(aM)
6	Bromomethane	94	1.655	1.655	(0.339)	935	0.50000	0.05(a)
19	Carbon Disulfide	76	2.570	2.570	(0.527)	5595	1.00000	0.83(a)
34	Carbon Tetrachloride	117	4.973	4.973	(0.886)	1045	0.50000	1.77(aM)
59	Chlorobenzene	112	8.264	8.264	(1.003)	3879	0.50000	0.47(a)
7	Chloroethane	64	1.741	1.741	(0.357)	1358	0.50000	0.60(aM)
28	Chloroform	83	4.643	4.643	(0.952)	2055	0.50000	0.39(a)
3	Chloromethane	50	1.325	1.325	(0.272)	1429	0.50000	(aM)
27	cis-1,2-Dichloroethene	96	4.264	4.264	(0.874)	1398	0.50000	0.42(a)
46	cis-1,3-Dichloropropene	75	6.750	6.750	(1.202)	1095	0.50000	1.95(aM)
55	Dibromochloromethane	129	7.747	7.747	(0.940)	630	0.50000	1.69(aM)
44	Dibromomethane	93	6.180	6.180	(1.101)	925	0.50000	0.45(a)
2	Dichlorodifluoromethane	85	1.186	1.186	(0.243)	1420	0.50000	(aM)
61	Ethylbenzene	106	8.361	8.361	(1.015)	1713	0.50000	0.41(a)
91	Hexachlorobutadiene	225	12.054	12.054	(1.179)	584	0.50000	0.41(aM)
67	Isopropylbenzene	105	9.119	9.119	(1.107)	4987	0.50000	0.40(a)
62	m,p-Xylenes	106	8.466	8.466	(1.028)	3986	1.00000	0.78(a)
17	Methylene Chloride	84	2.851	2.851	(0.584)	1919	0.50000	0.60(a)
87	n-Butylbenzene	91	10.547	10.547	(1.032)	4151	0.50000	0.45(a)
73	n-Propylbenzene	91	9.467	9.467	(0.926)	5751	0.50000	0.40(a)
92	Naphthalene	128	12.121	12.121	(1.186)	5022	0.50000	0.43(a)
63	o-Xylene	106	8.804	8.804	(1.069)	2107	0.50000	0.41(a)
81	sec-Butylbenzene	105	10.078	10.078	(0.986)	4774	0.50000	0.41(a)
64	Styrene	104	8.819	8.819	(1.071)	3248	0.50000	0.37(a)
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	3788	0.50000	0.44(a)
56	Tetrachloroethene	164	7.511	7.511	(0.912)	1122	0.50000	0.47(a)
50	Toluene	91	7.038	7.038	(0.854)	5816	0.50000	0.45(a)
20	trans-1,2-Dichloroethene	96	3.121	3.121	(0.640)	1392	0.50000	0.51(a)
51	trans-1,3-Dichloropropene	75	7.256	7.256	(1.292)	735	0.50000	2.27(aM)
38	Trichloroethene	130	5.850	5.850	(1.042)	1292	0.50000	0.41(a)
8	Trichlorofluoromethane	101	1.932	1.932	(0.396)	1758	0.50000	0.40(a)
5	Vinyl Chloride	62	1.400	1.400	(0.287)	1493	0.50000	0.45(a)

QC Flag Legend

T - Target compound detected outside RT window.
a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

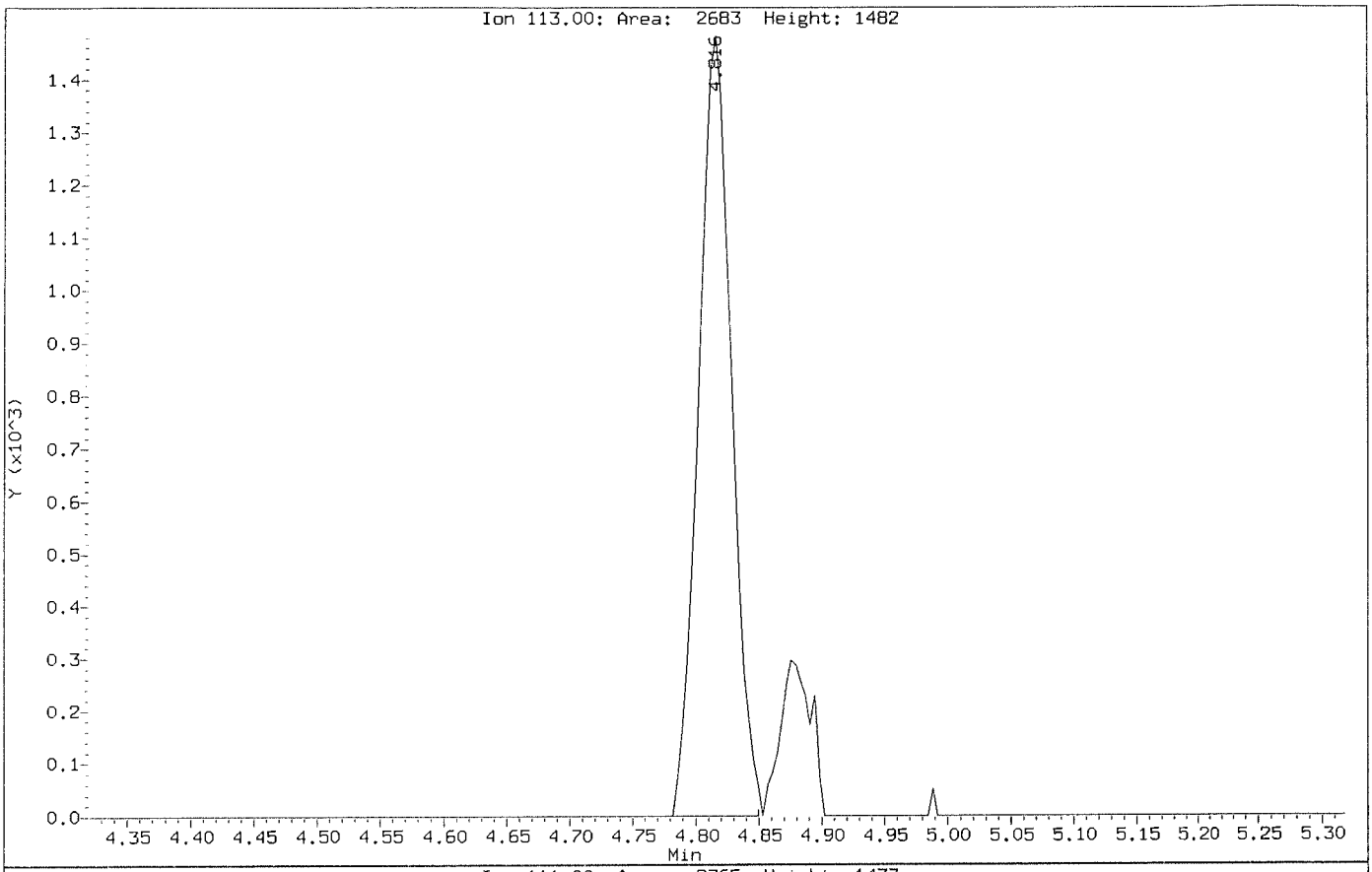


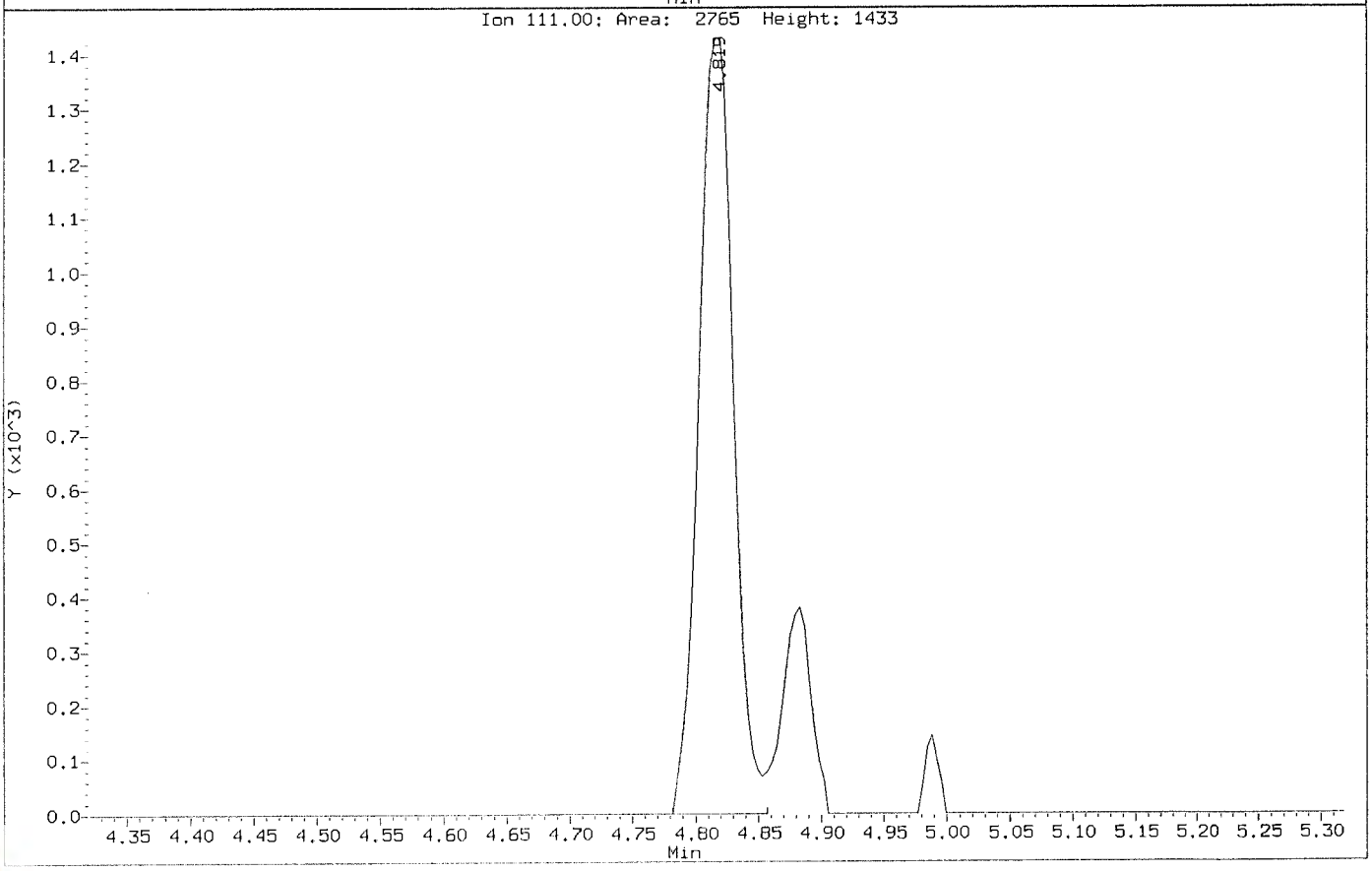
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Sample Info: VSTD000,5;VSTD000,5;1;2;;
Purge Volume: 5.0
Column phase: DB624

Instrument: WOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111503.D
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

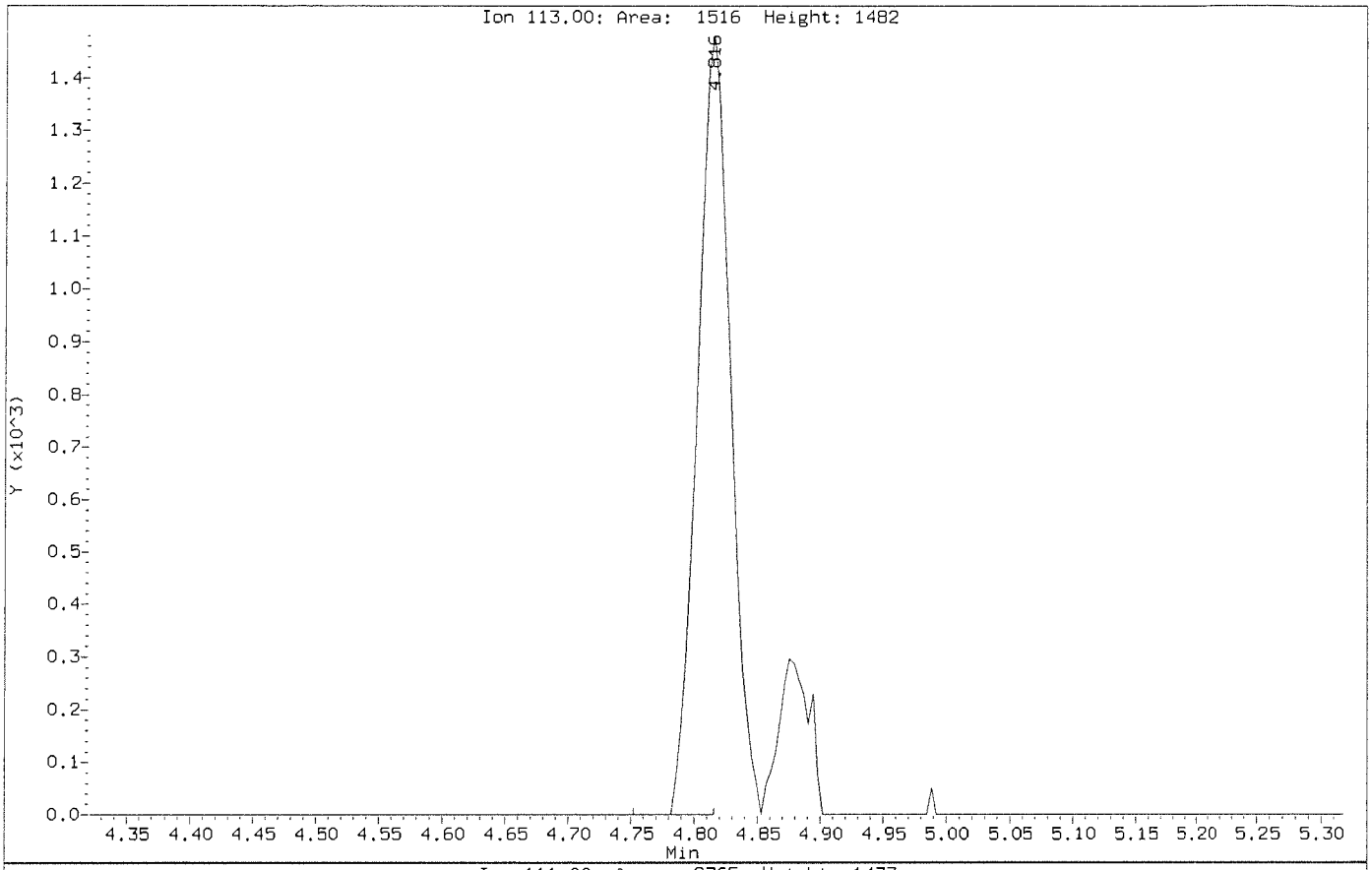
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CAS Number: 1868-53-7

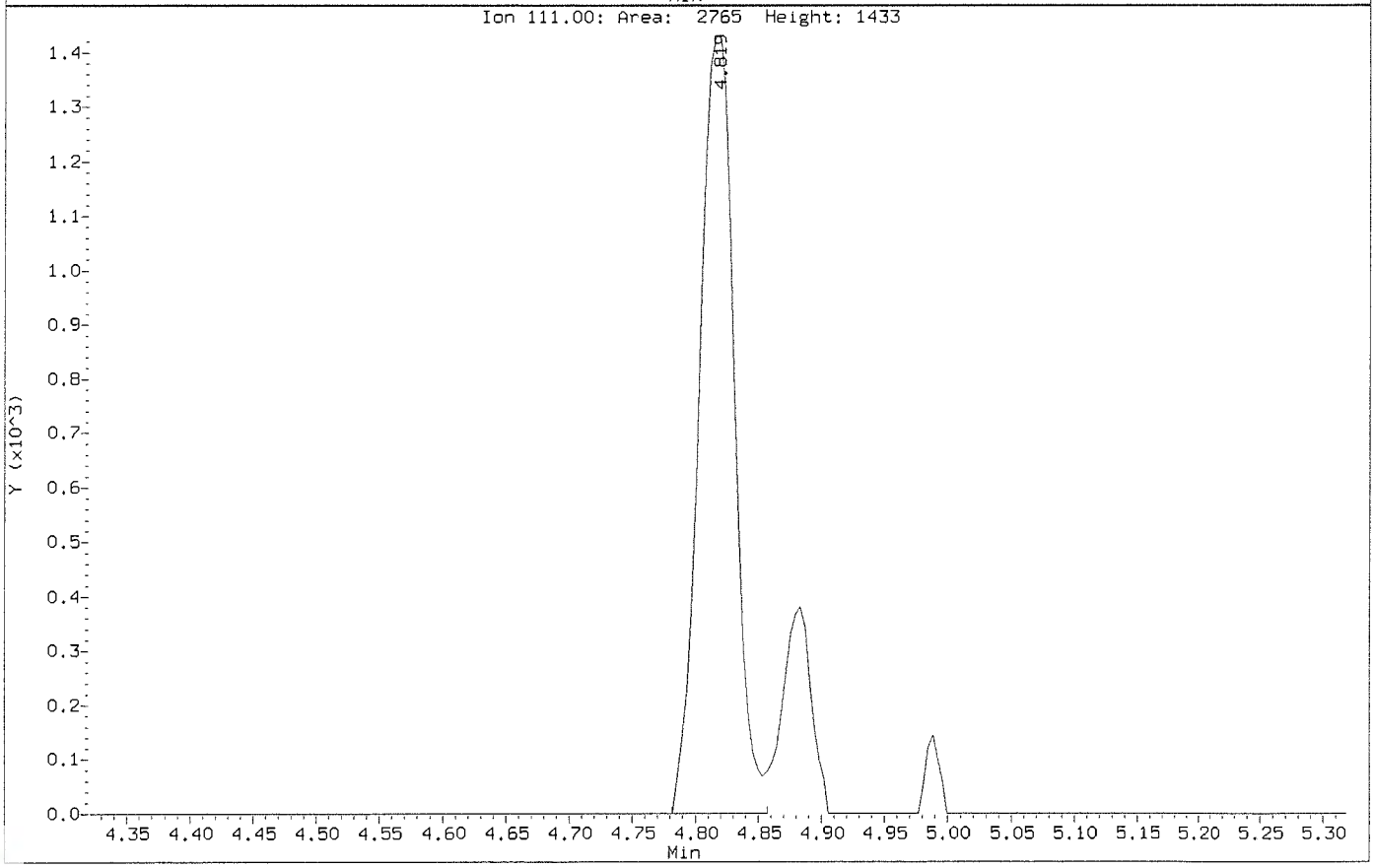




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Client Sample ID: VSTD000.5

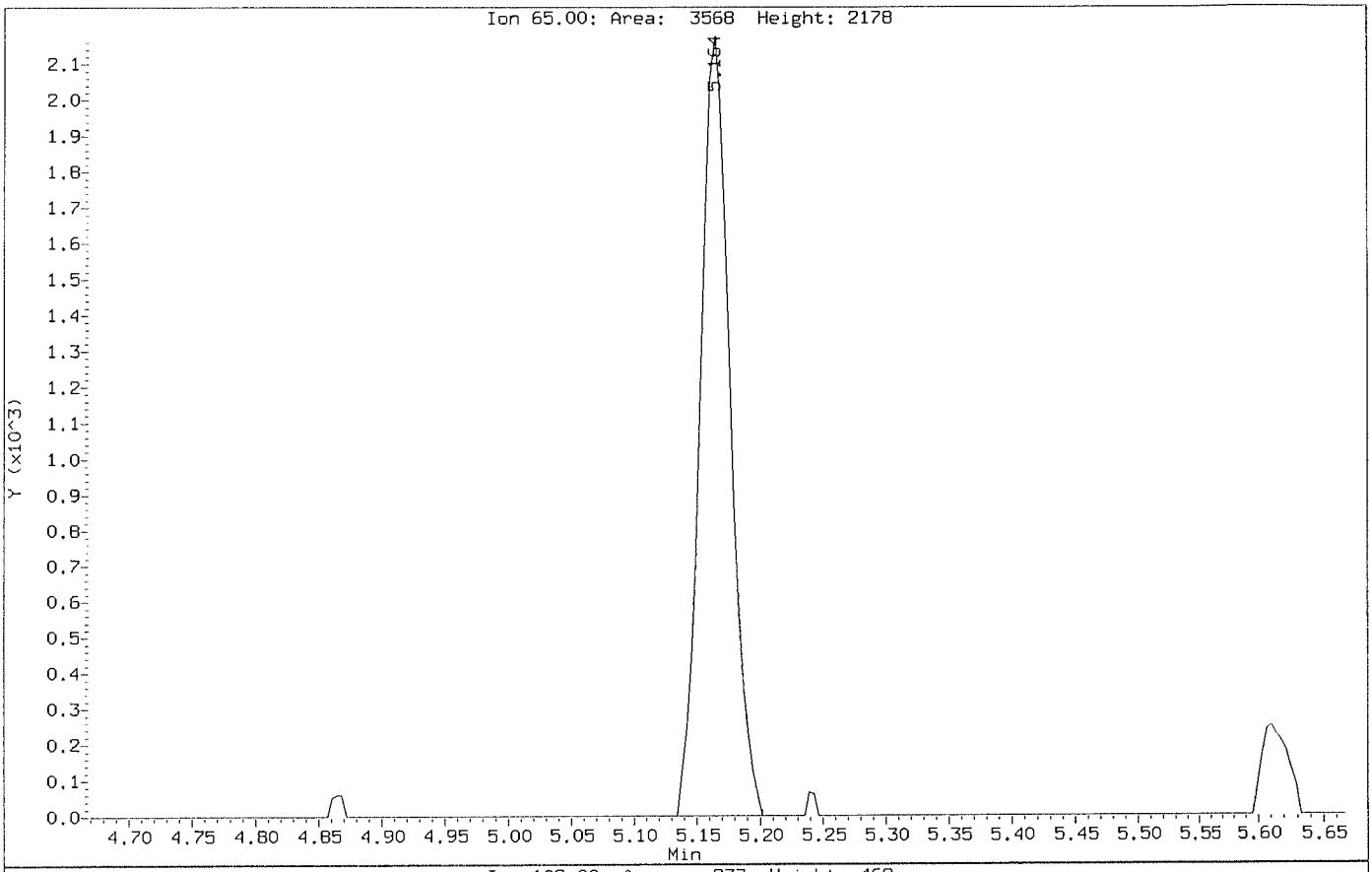
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CAS Number: 1868-53-7

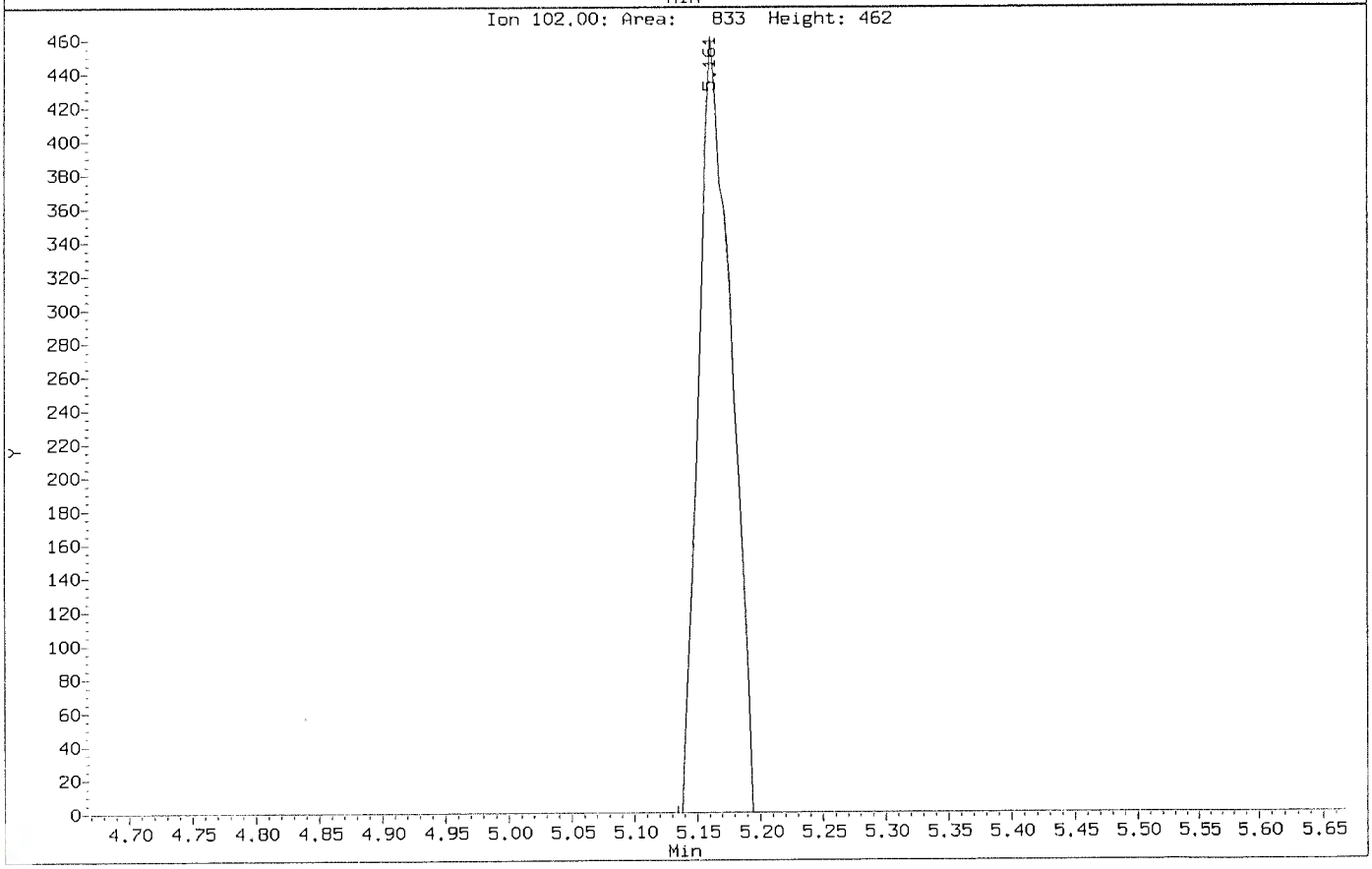




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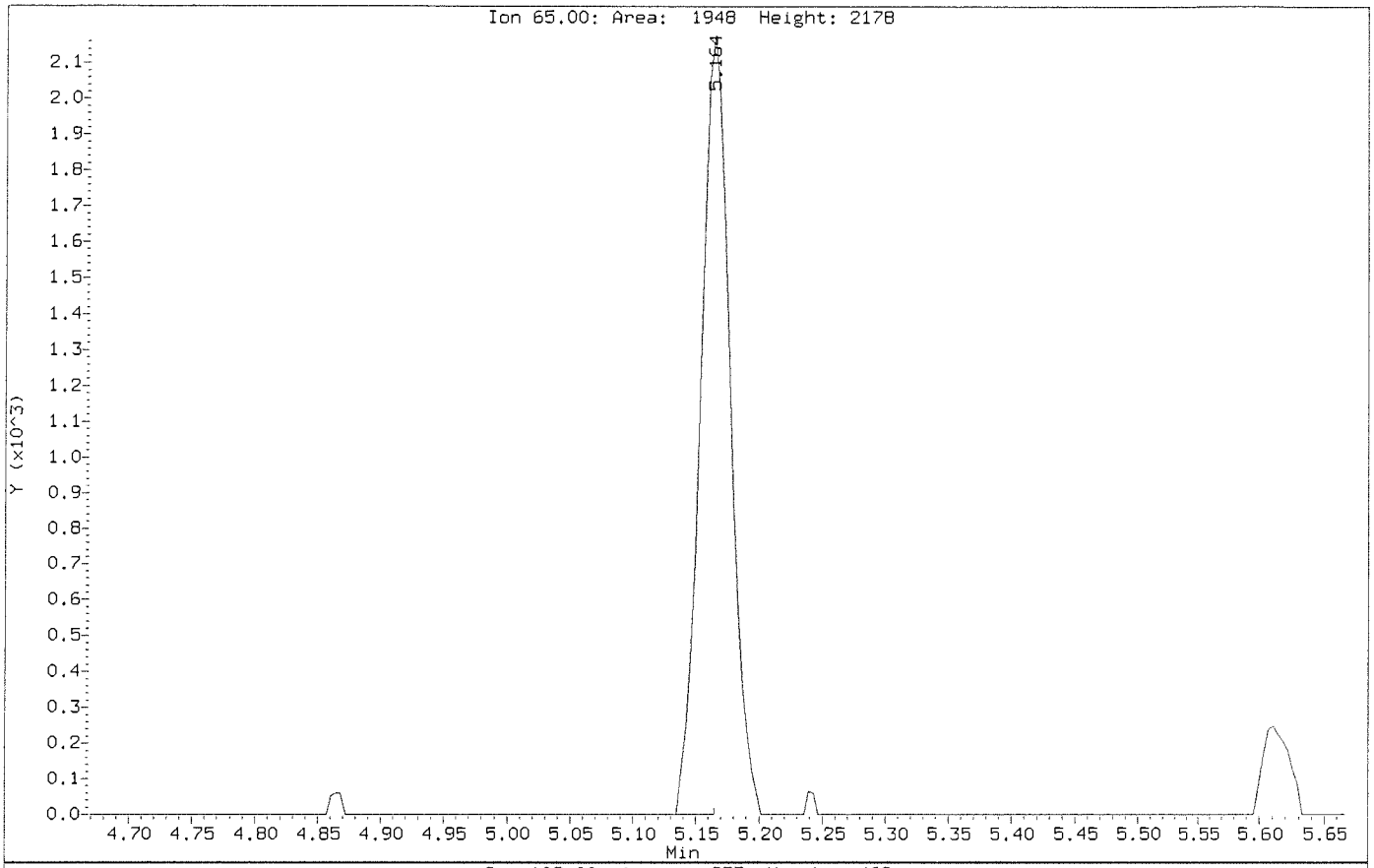
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CAS Number: 17060-07-0

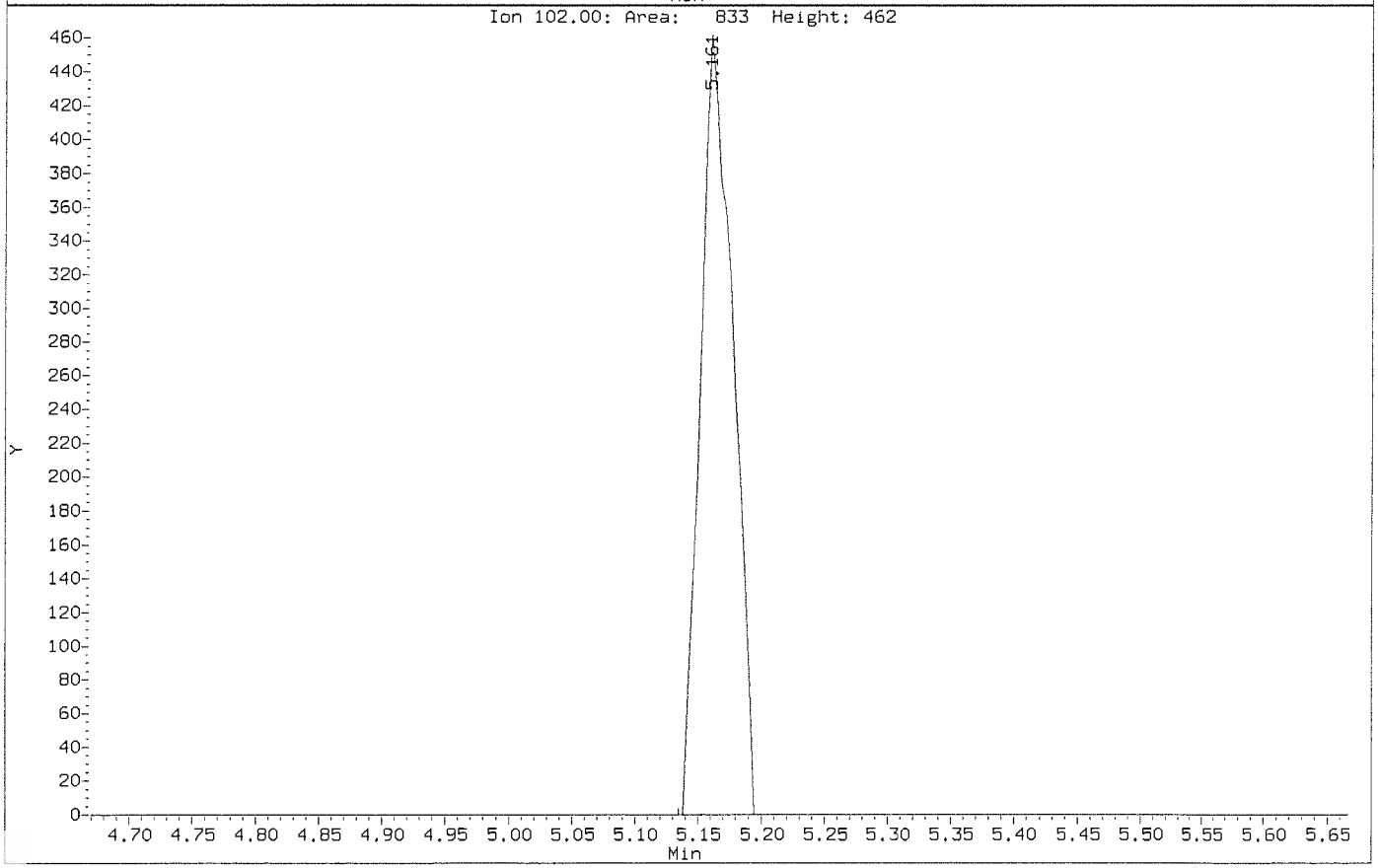




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Injection Date: 15-NOV-2021 14:36
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Client Sample ID: VSTD000.5

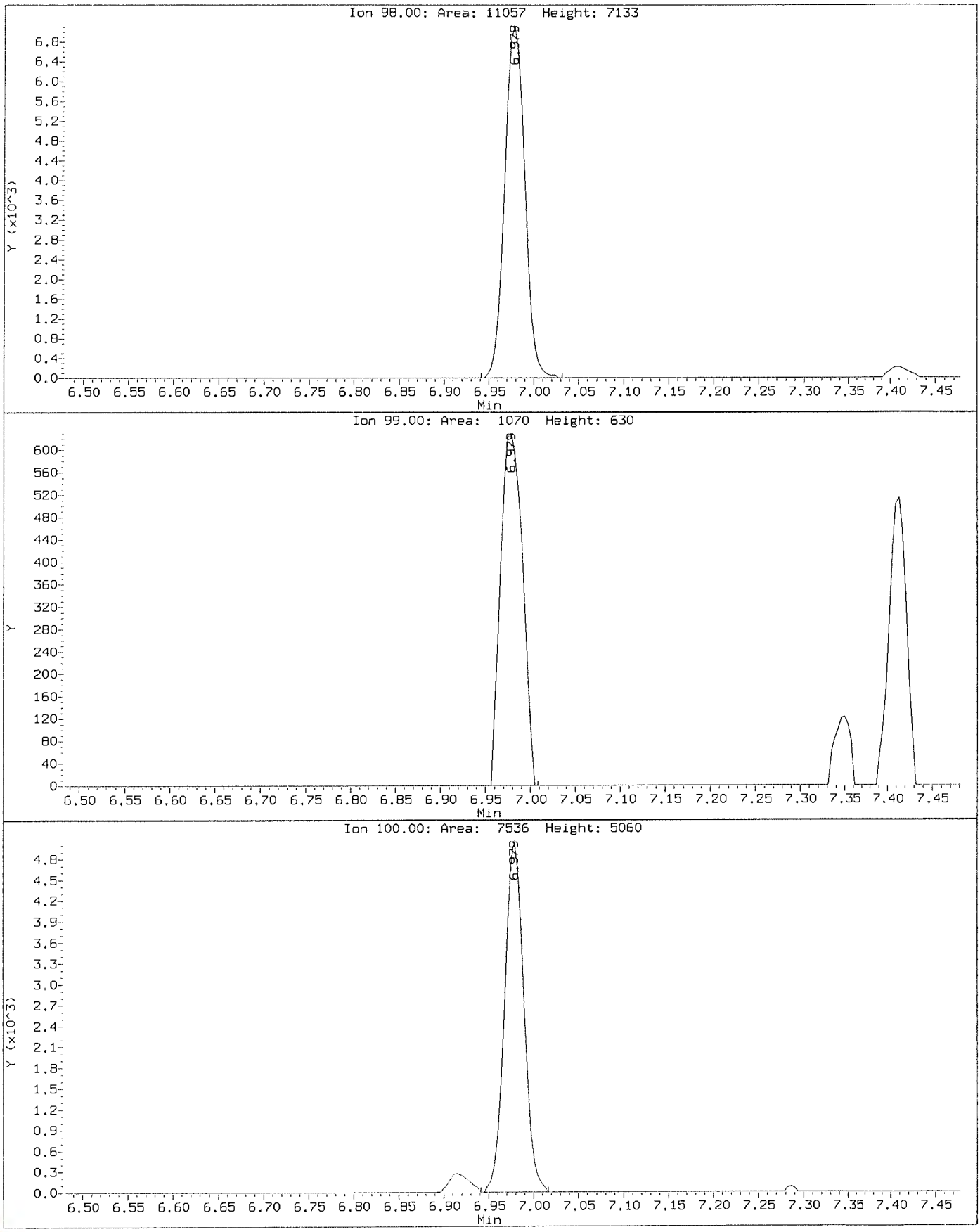
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CAS Number: 17060-07-0





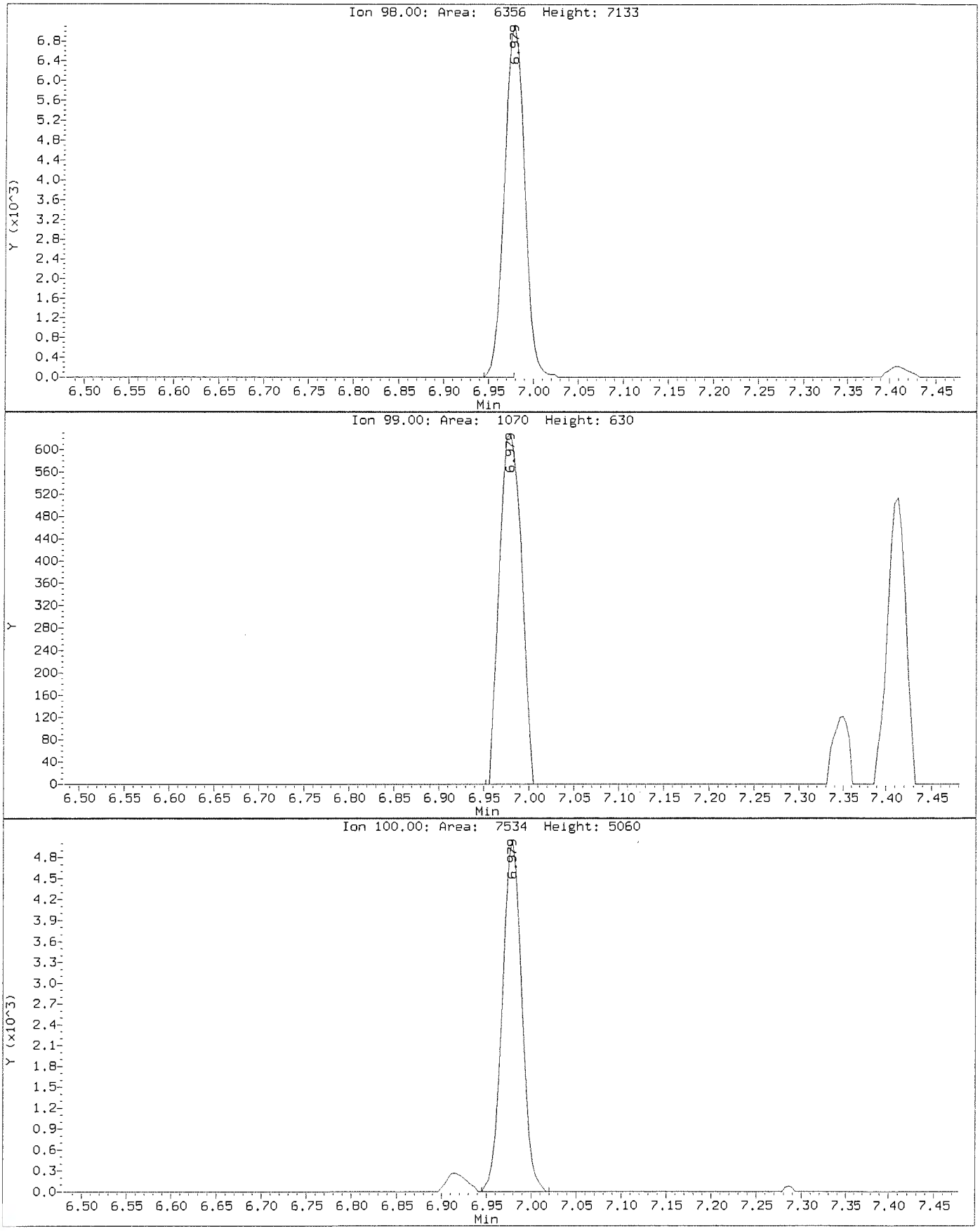
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Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Toluene-d8
CAS Number: 2037-26-5



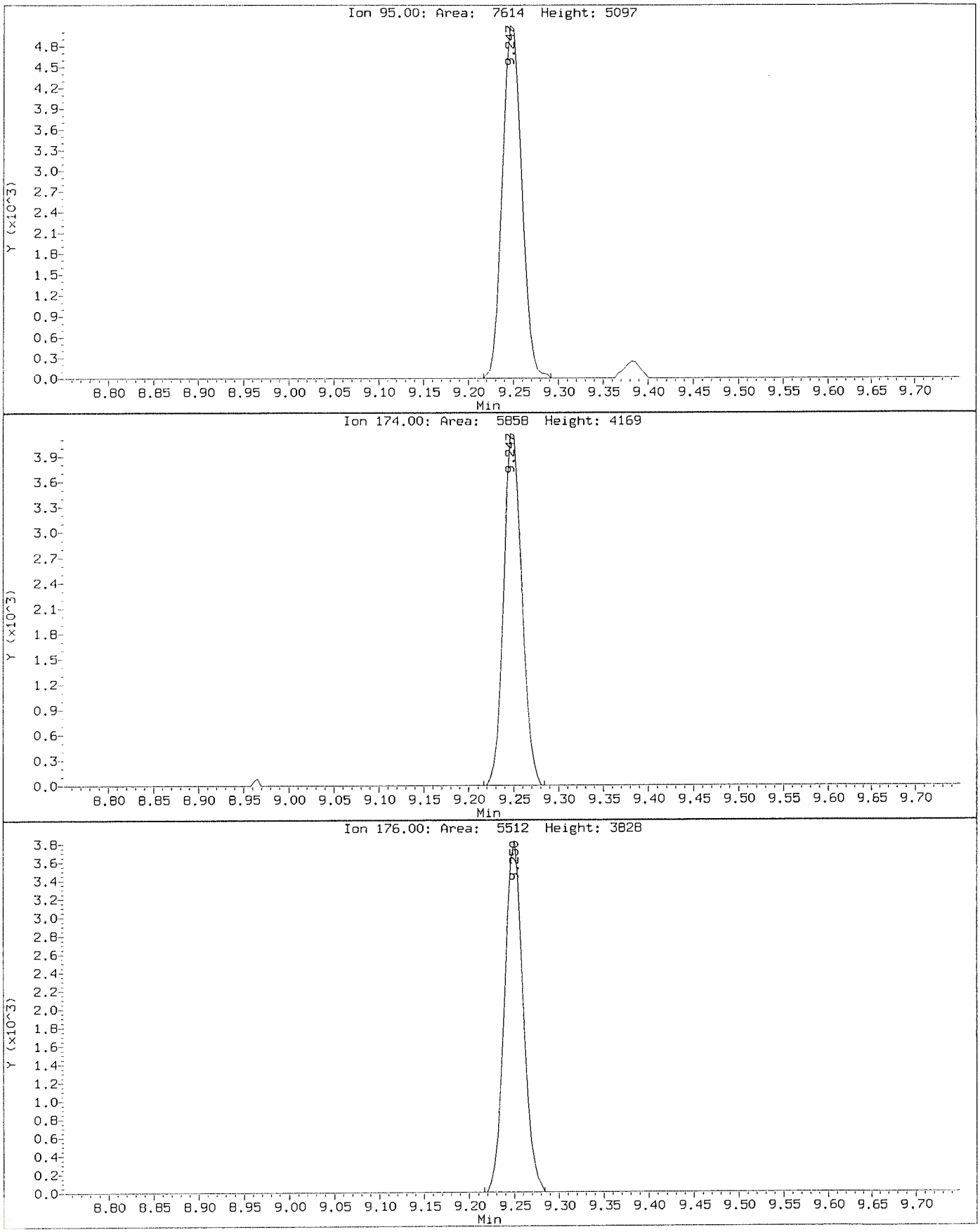
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Injection Date: 15-NOV-2021 14:36
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Client Sample ID: VSTD000.5

Compound: Toluene-d8
CAS Number: 2037-26-5



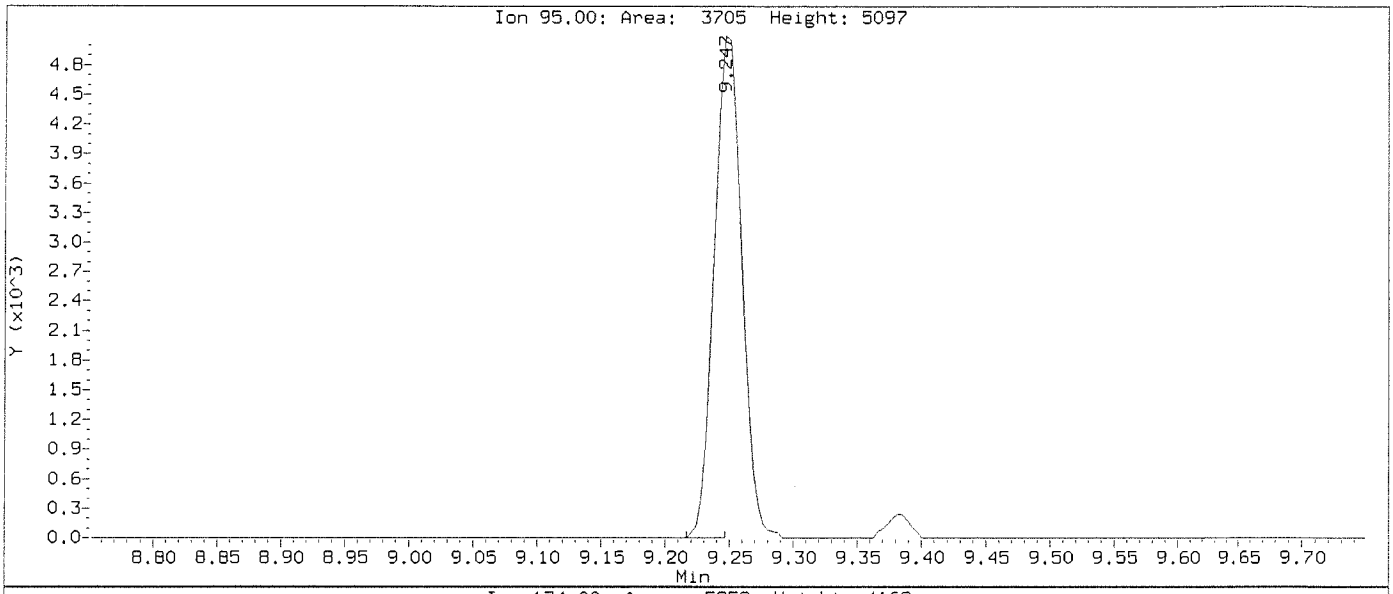
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Instrument: VOA9.i
Client Sample ID: VSTD000.5

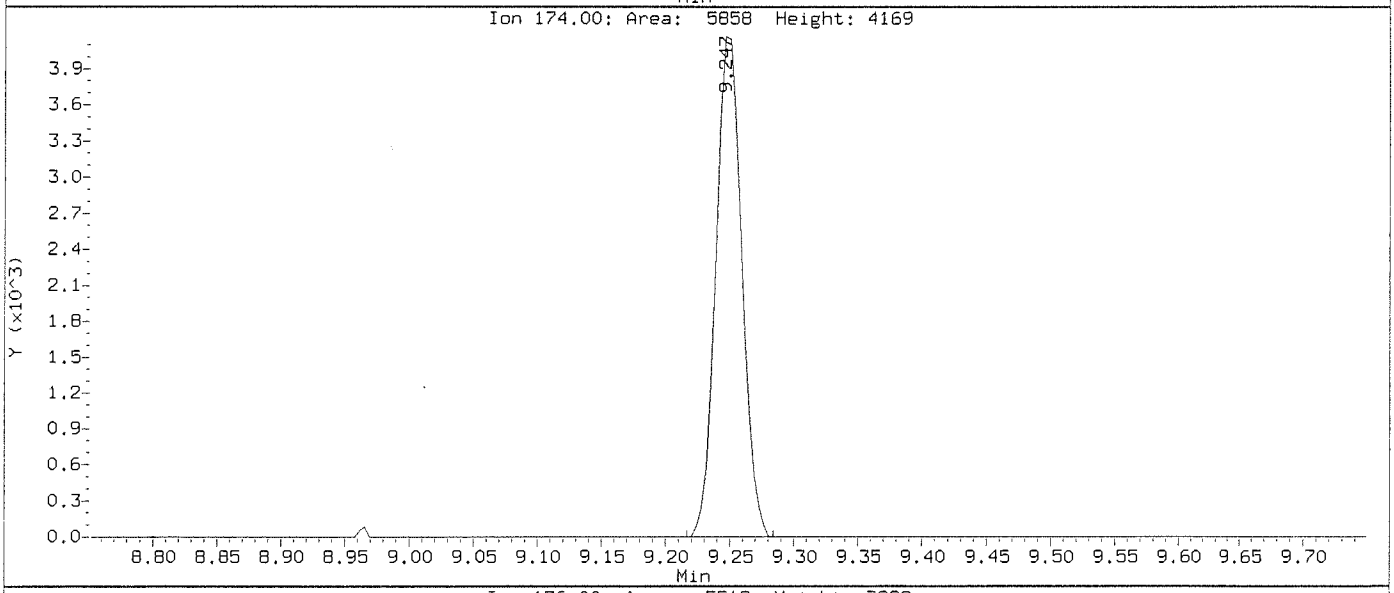
Compound: 4-Bromofluorobenzene
CAS Number: 460-00-4

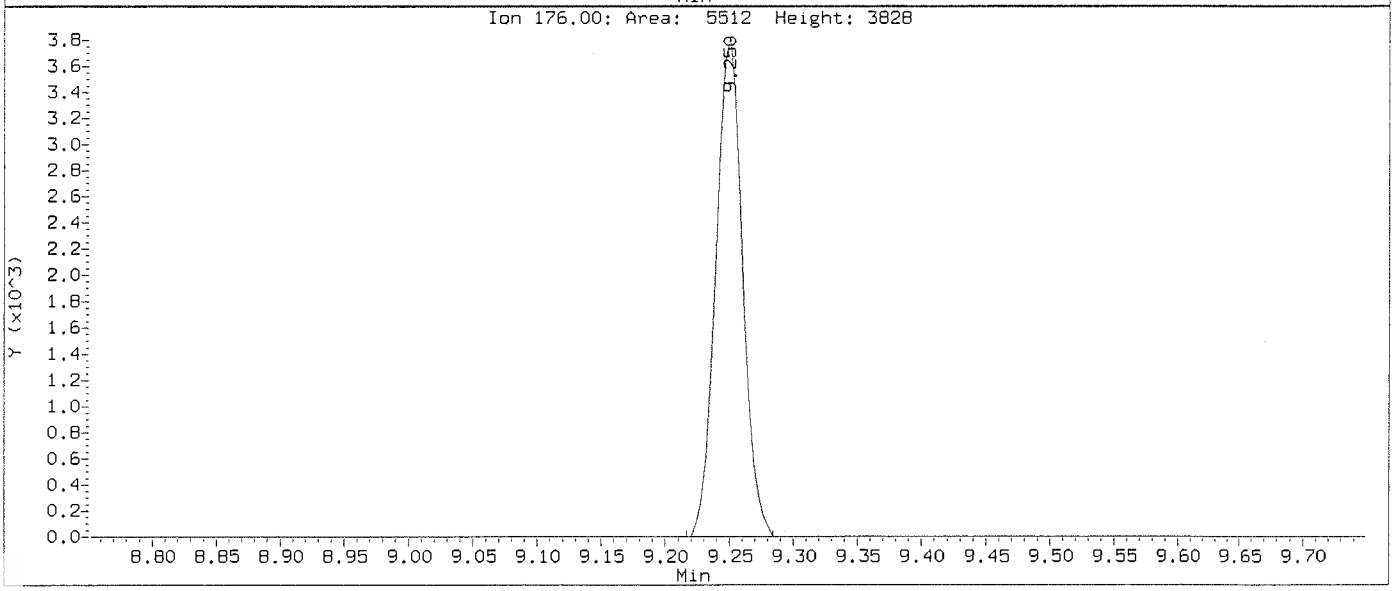


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Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 4-Bromofluorobenzene
CAS Number: 460-00-4

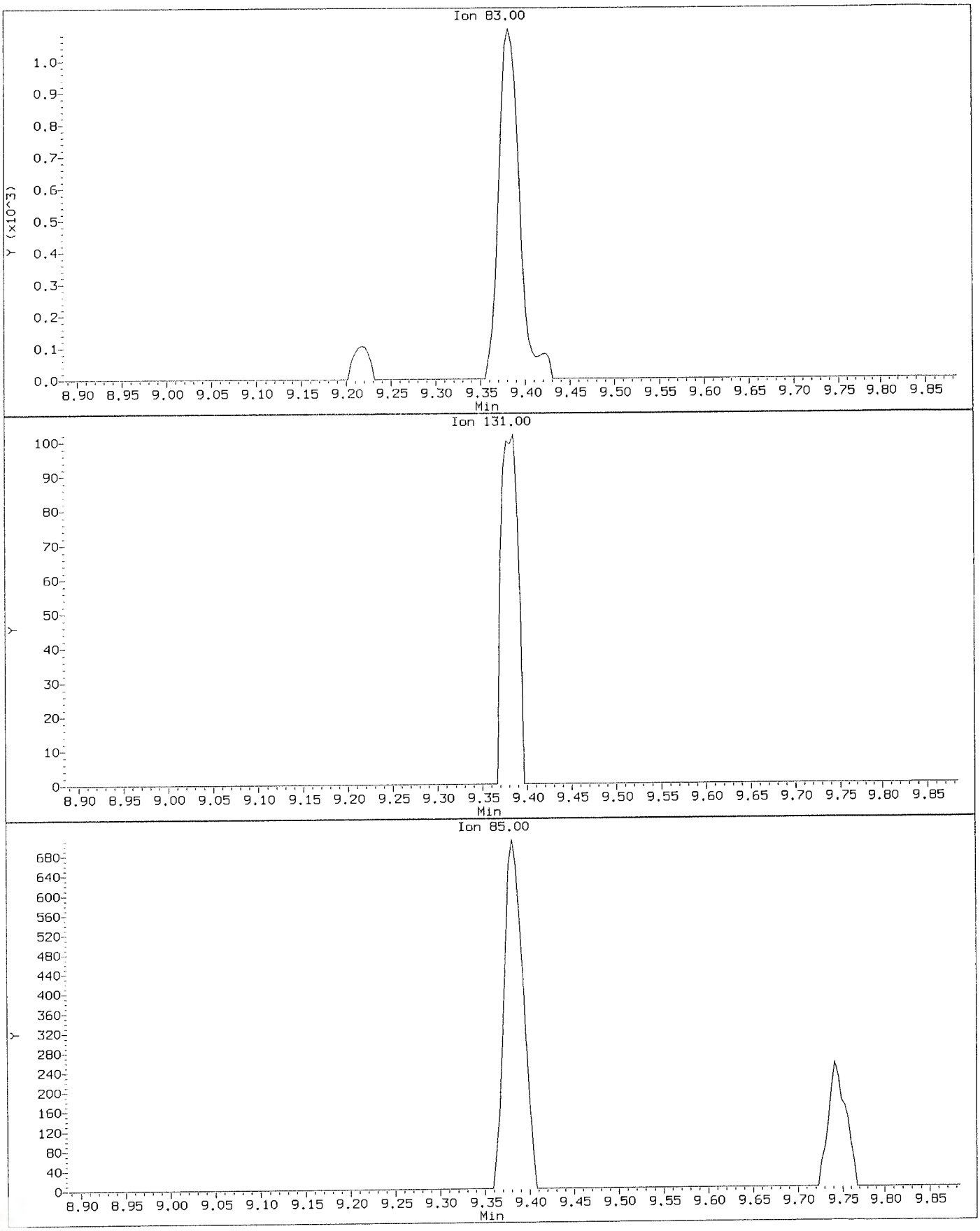






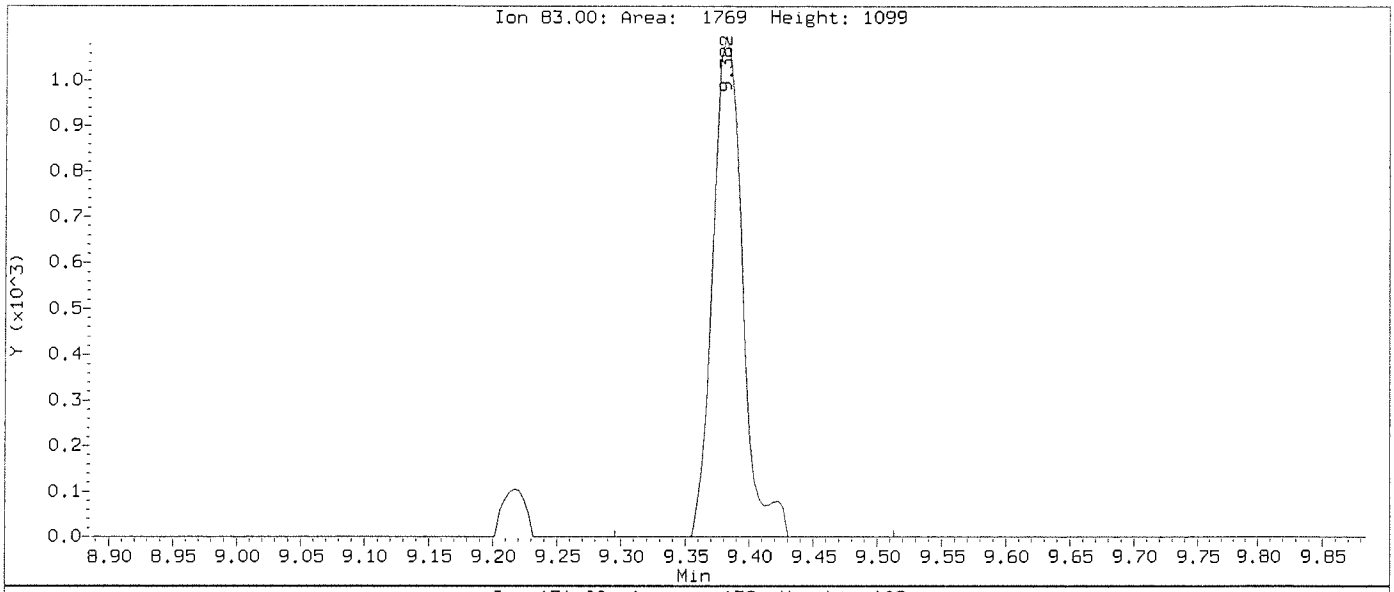
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Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

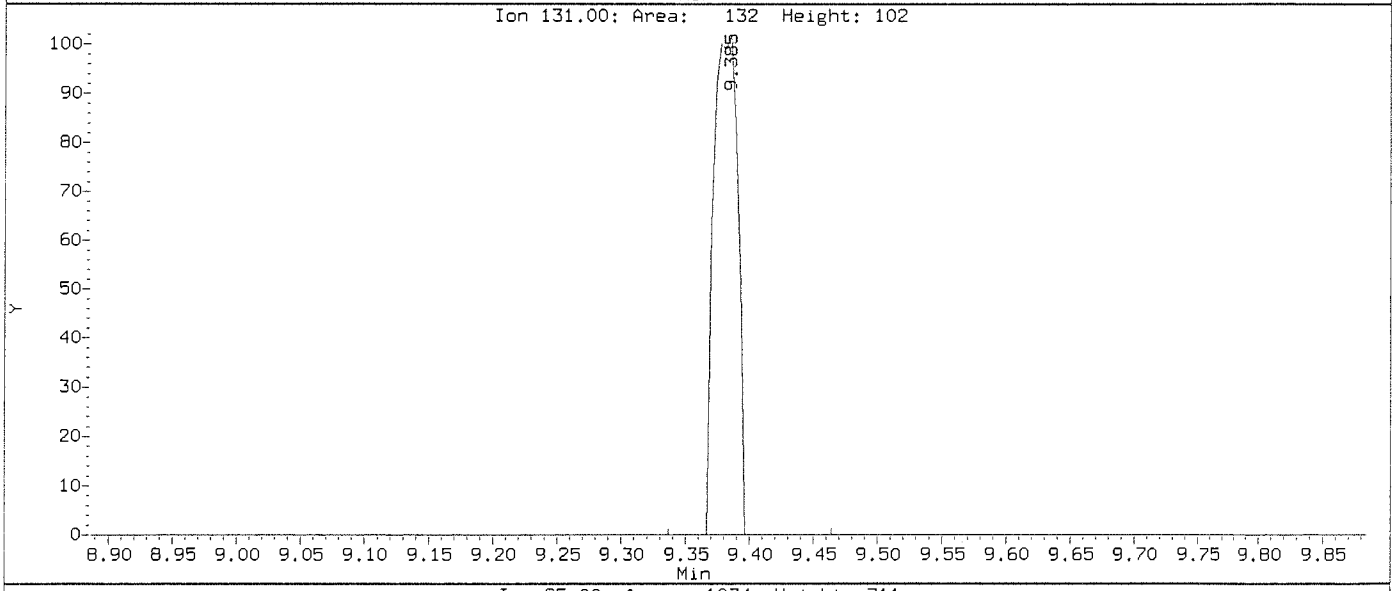
Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5

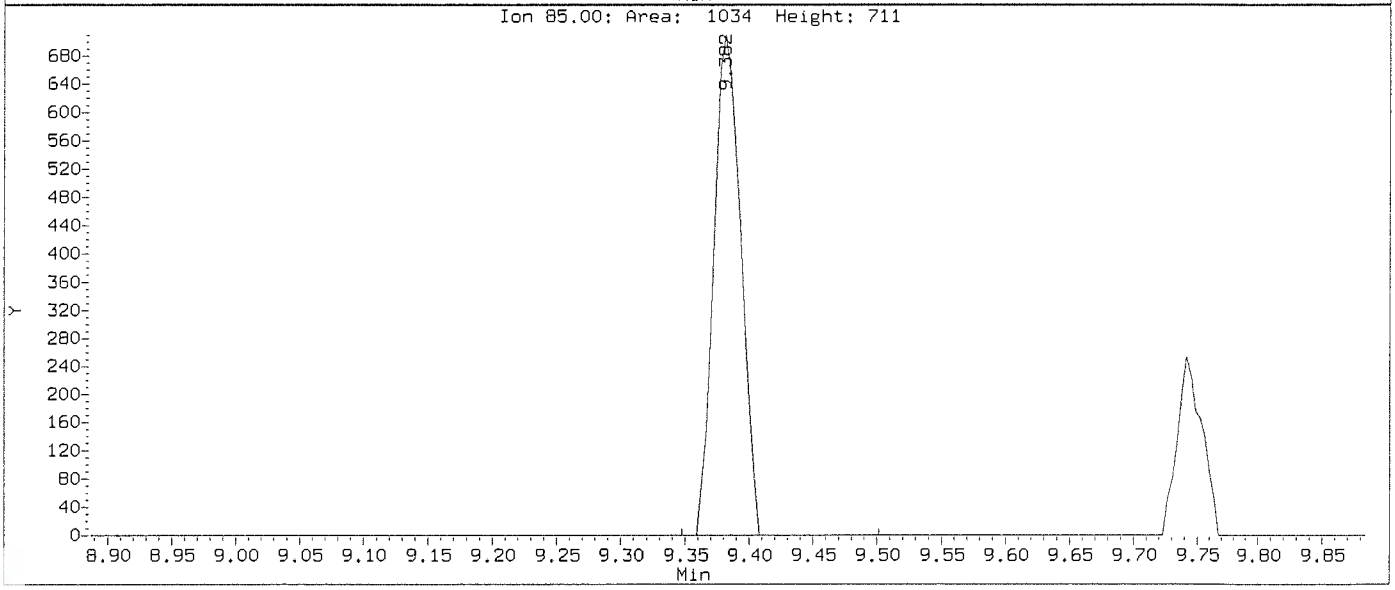


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Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5

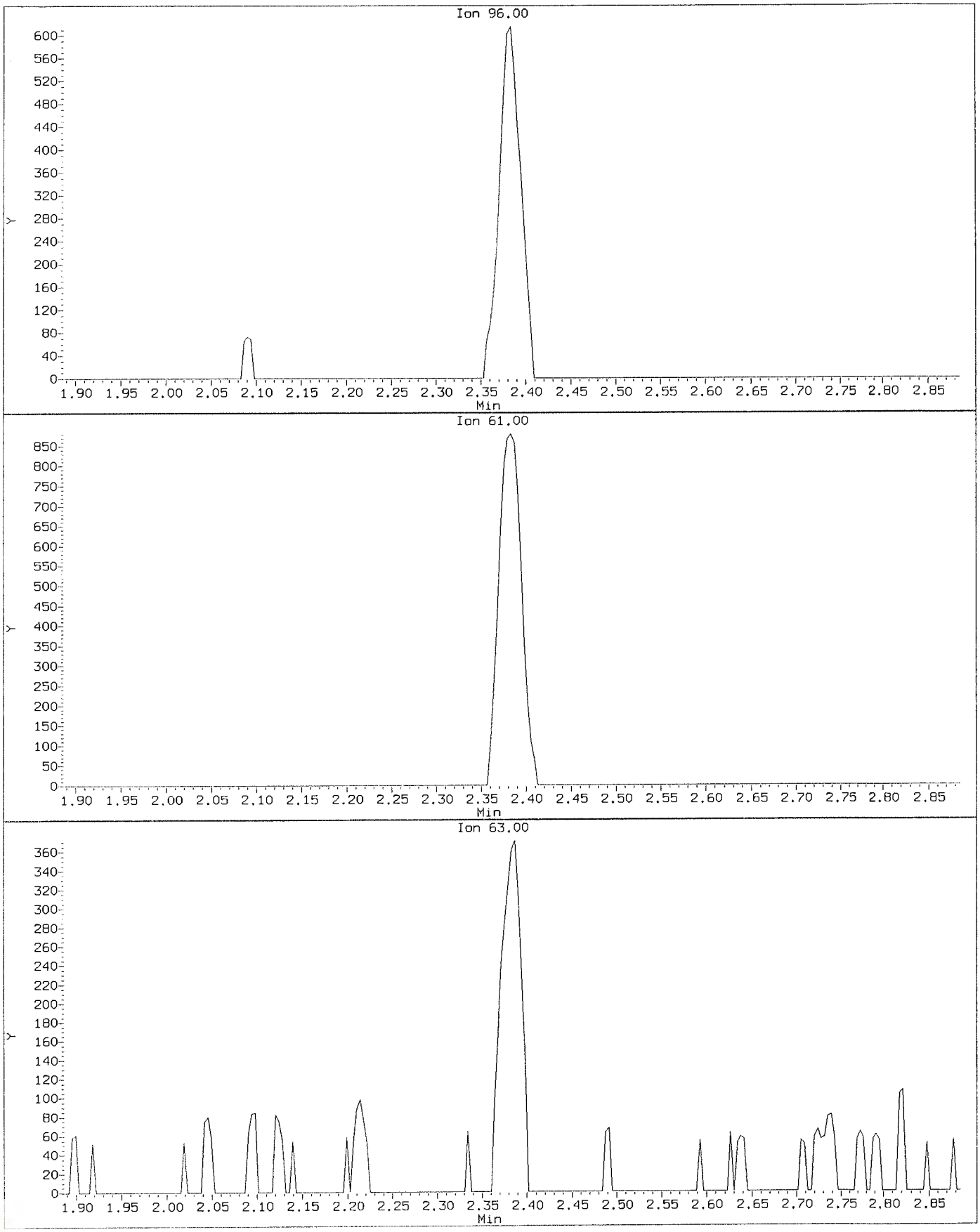






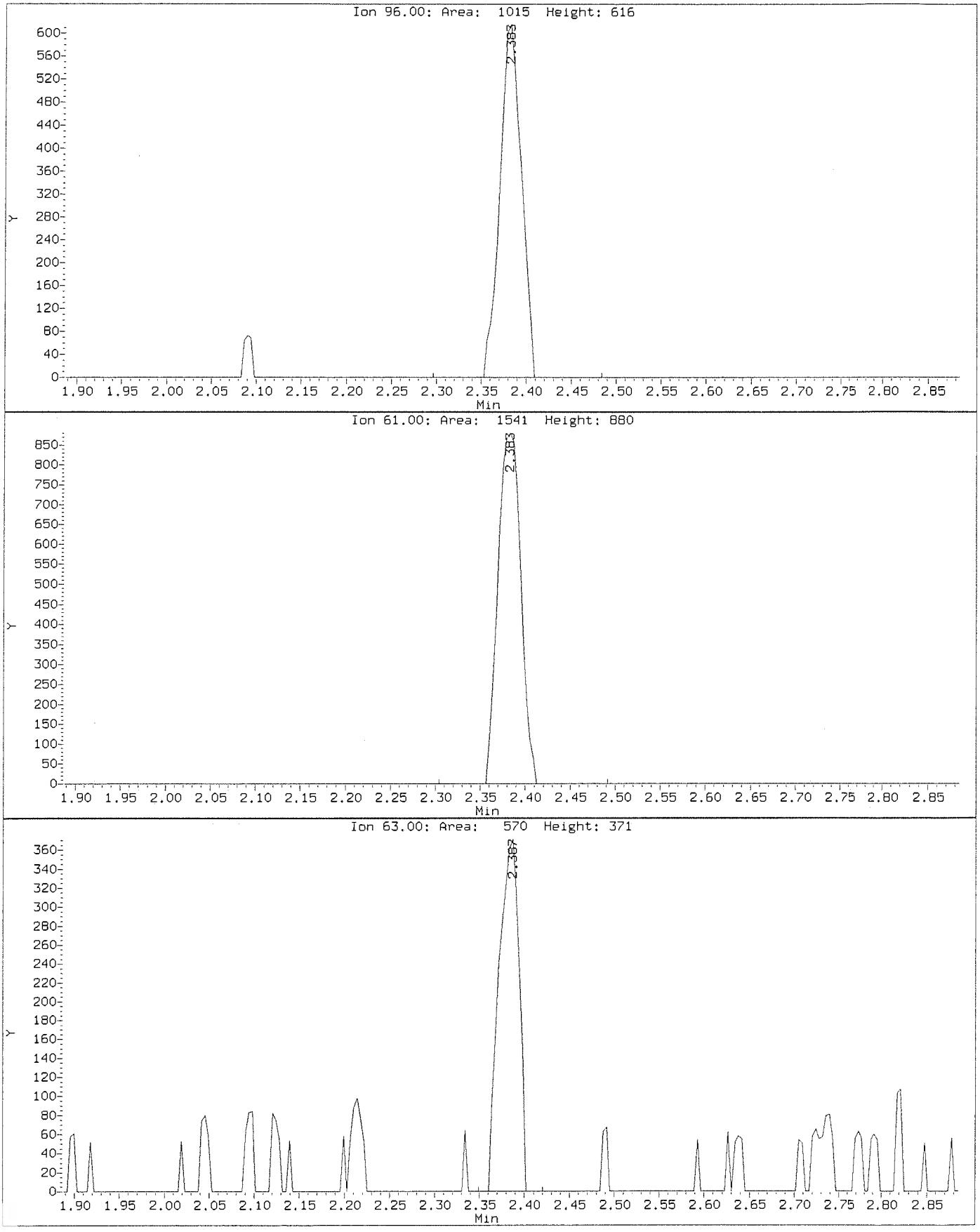
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Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,1-Dichloroethene
CAS Number: 75-35-4



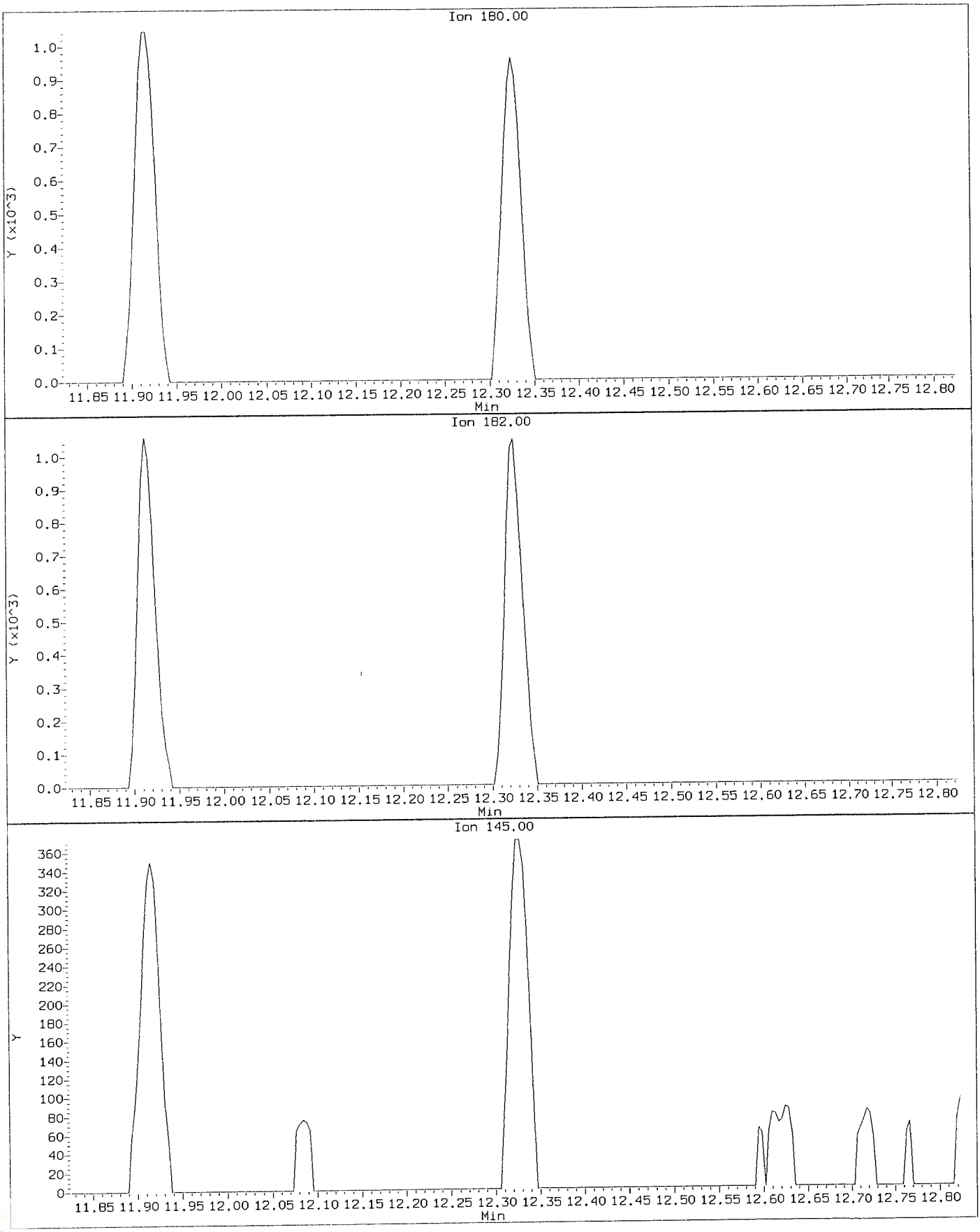
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Client Sample ID: VSTD000.5

Compound: 1,1-Dichloroethene
CAS Number: 75-35-4



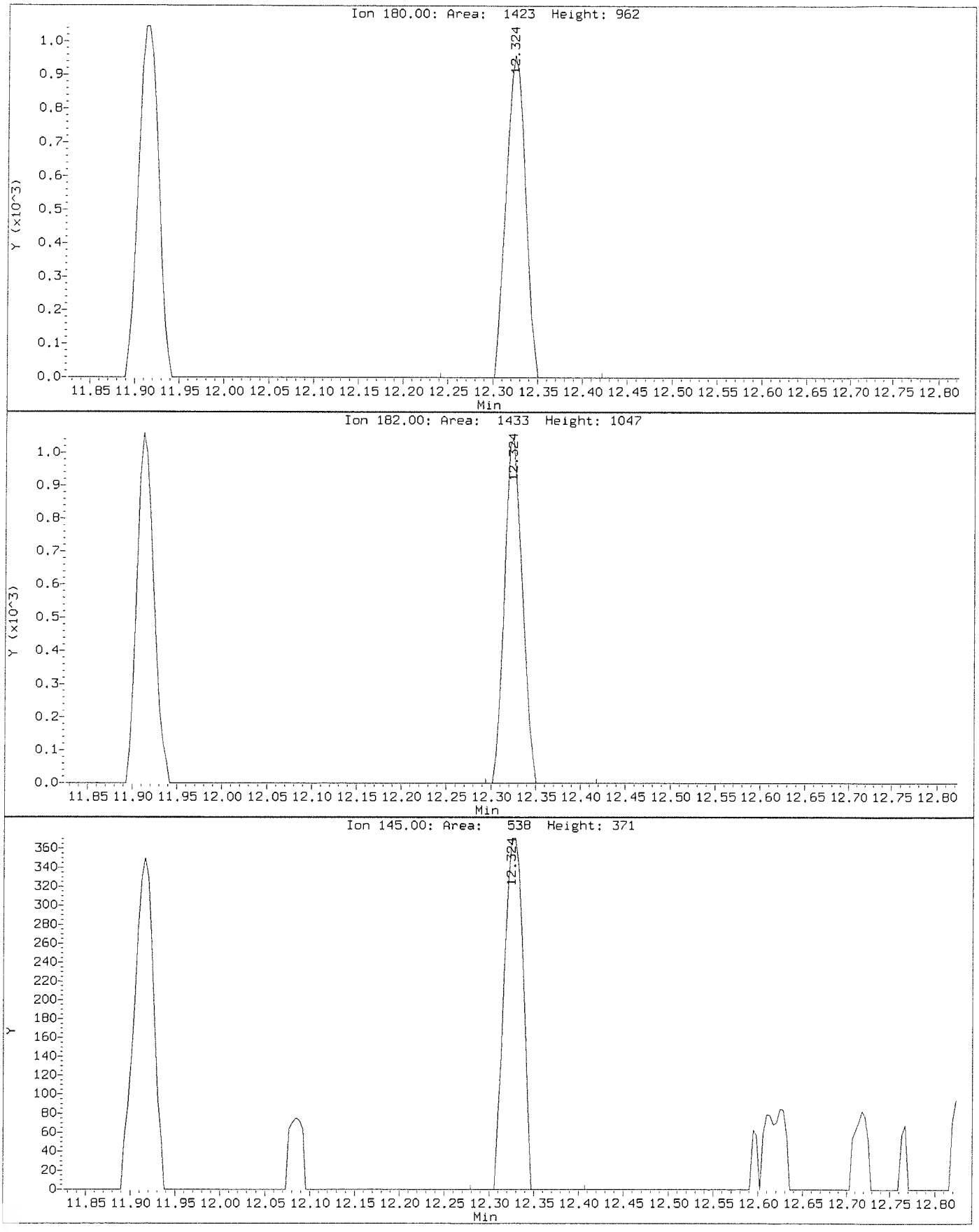
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Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,2,3-Trichlorobenzene
CAS Number: 87-61-6



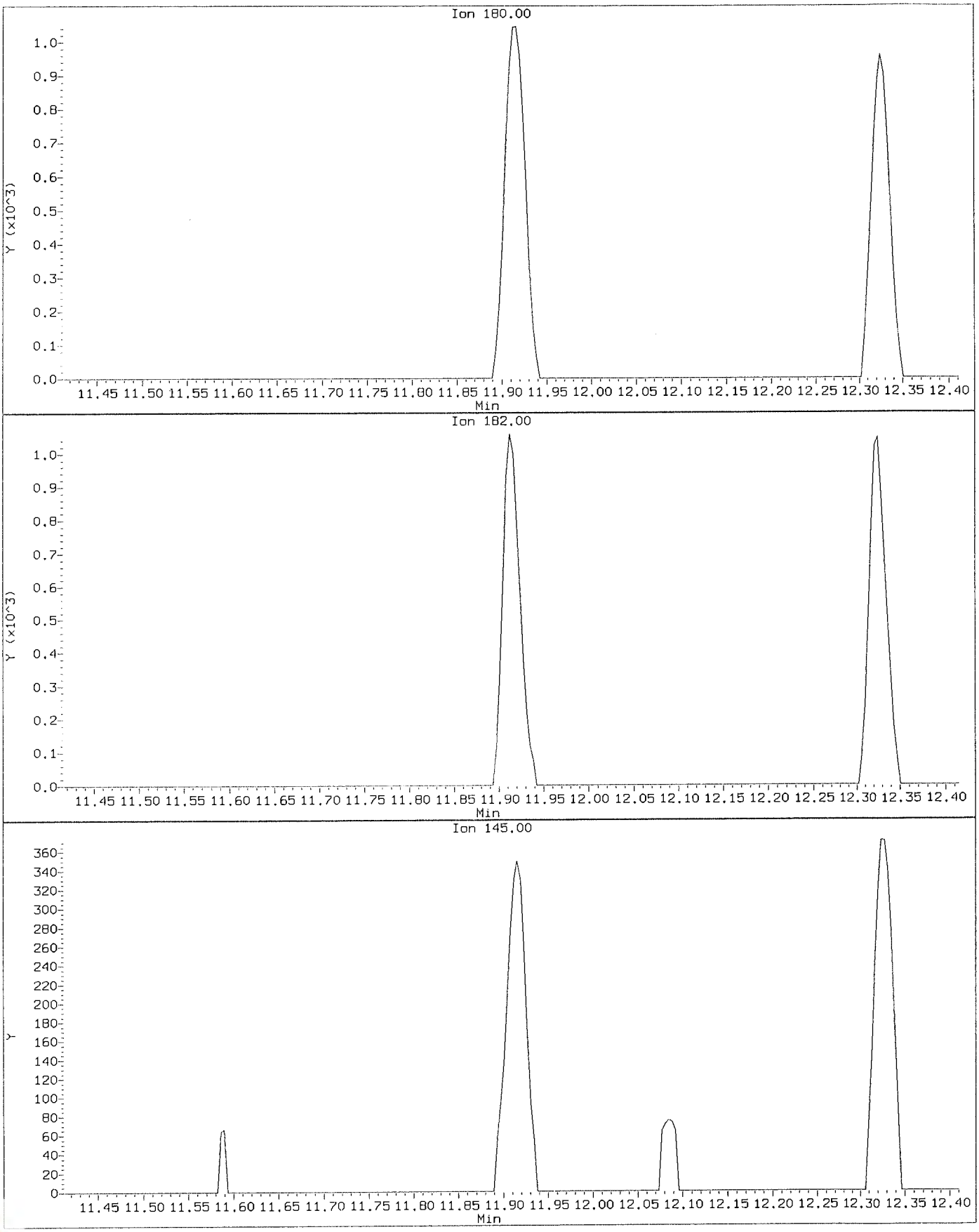
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Client Sample ID: VSTD000.5

Compound: 1,2,3-Trichlorobenzene
CAS Number: 87-61-6



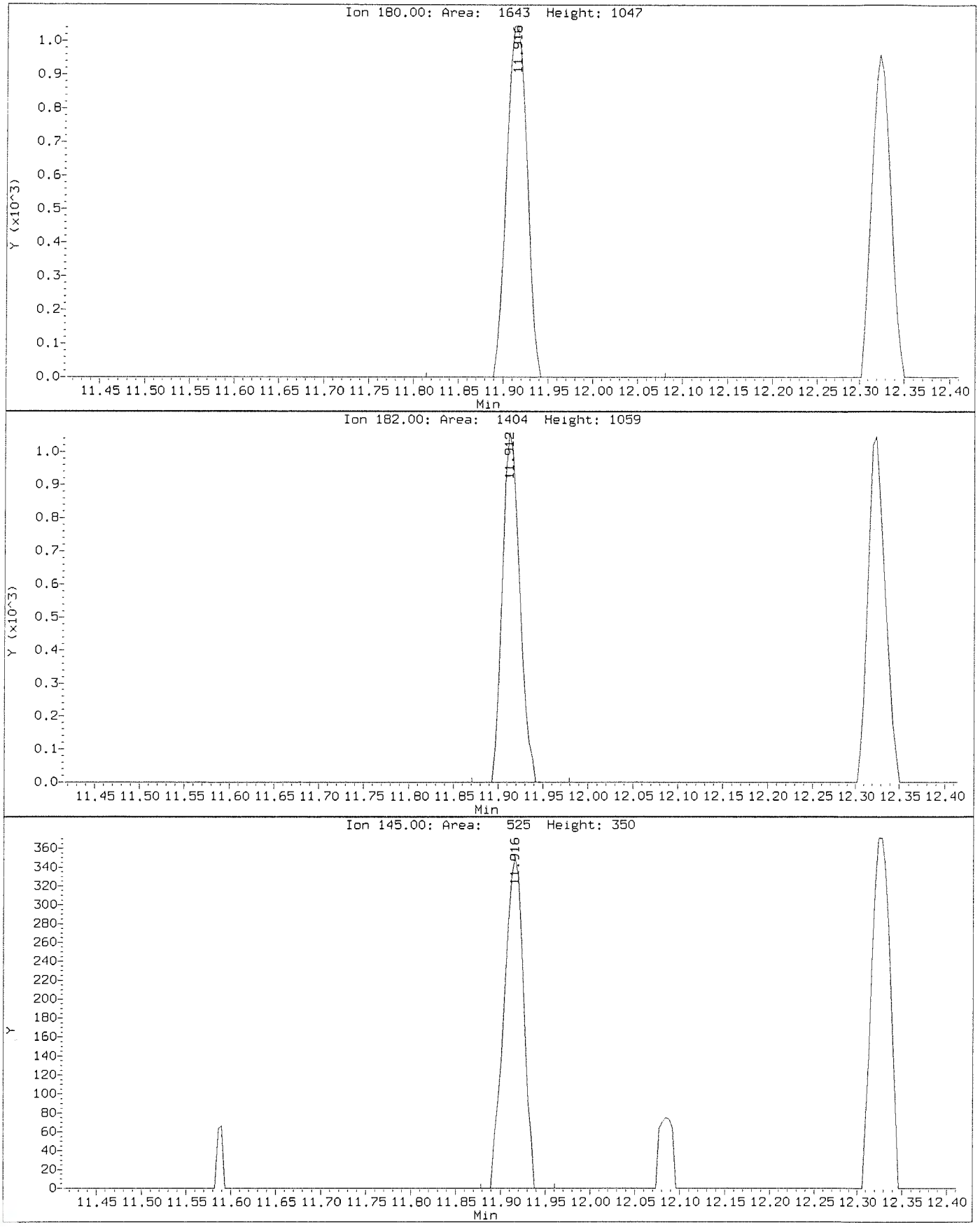
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Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,2,4-Trichlorobenzene
CAS Number: 120-82-1



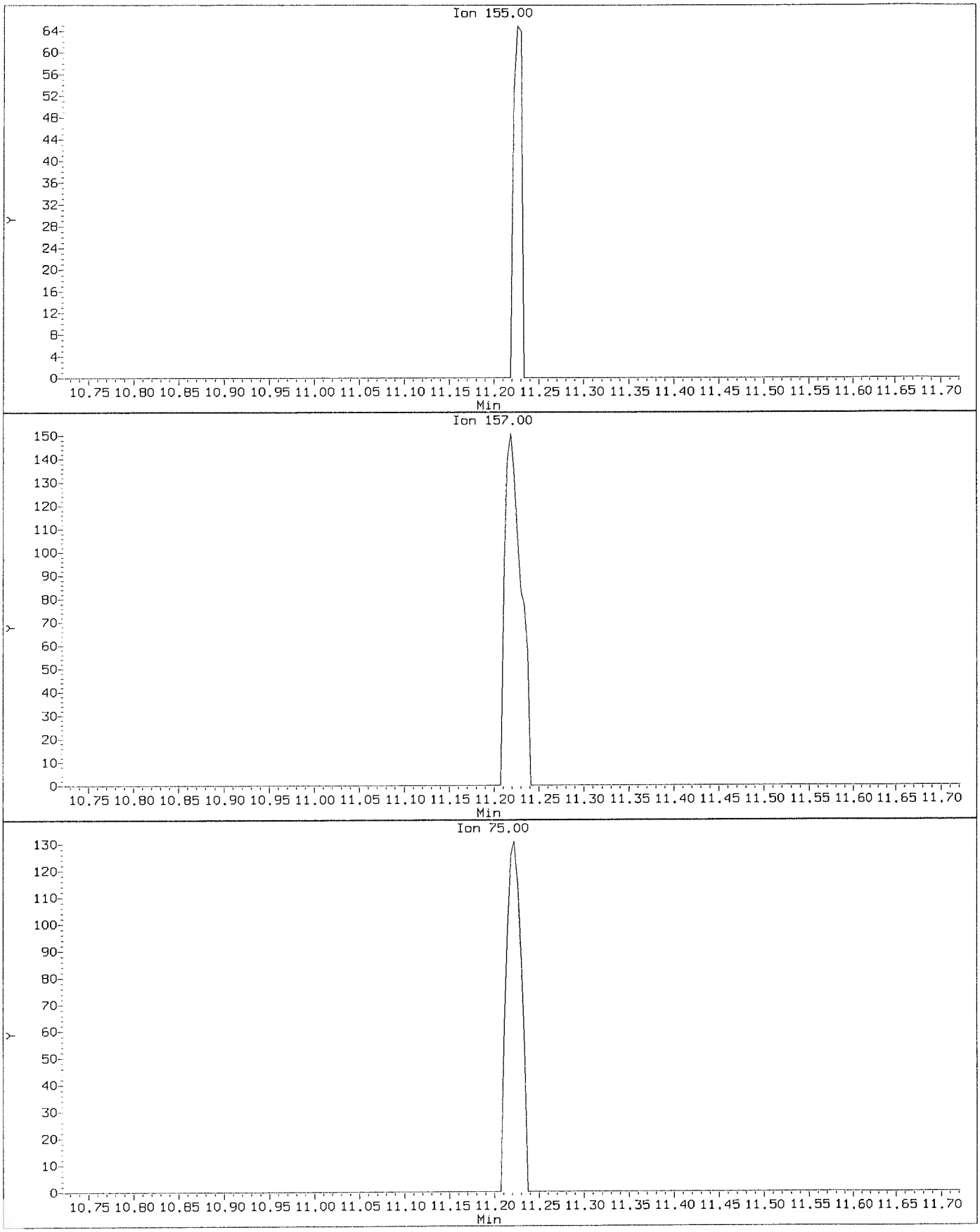
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Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,2,4-Trichlorobenzene
CAS Number: 120-82-1



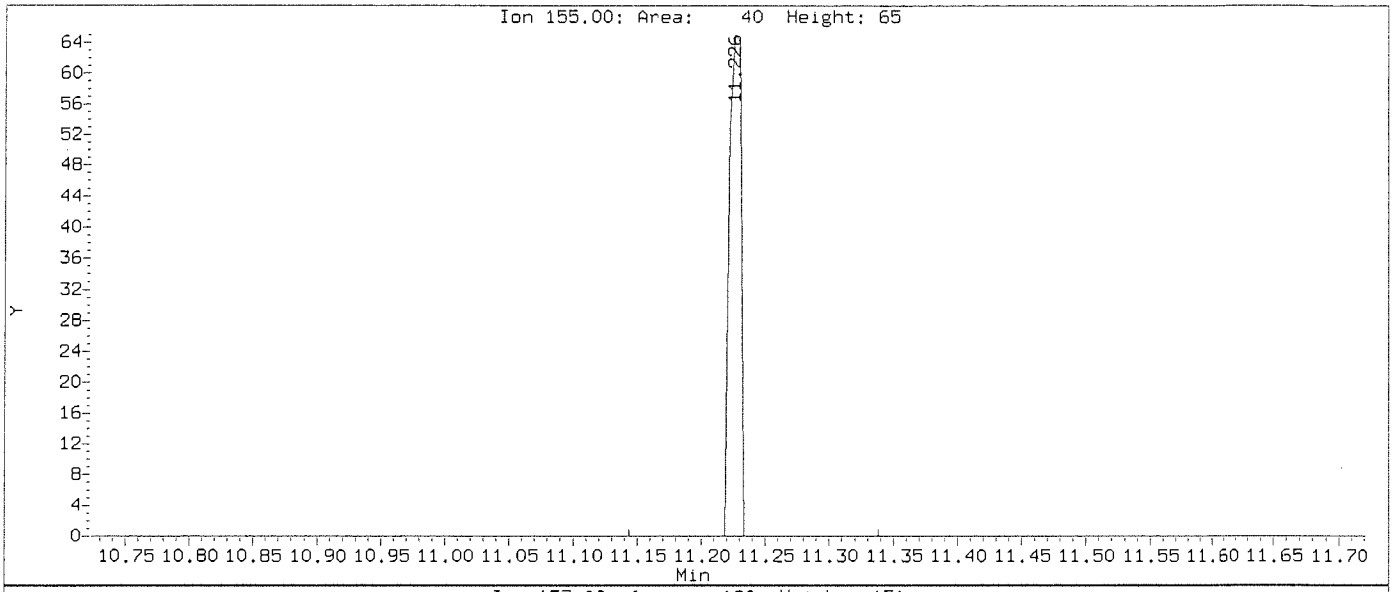
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Client Sample ID: VSTD000.5

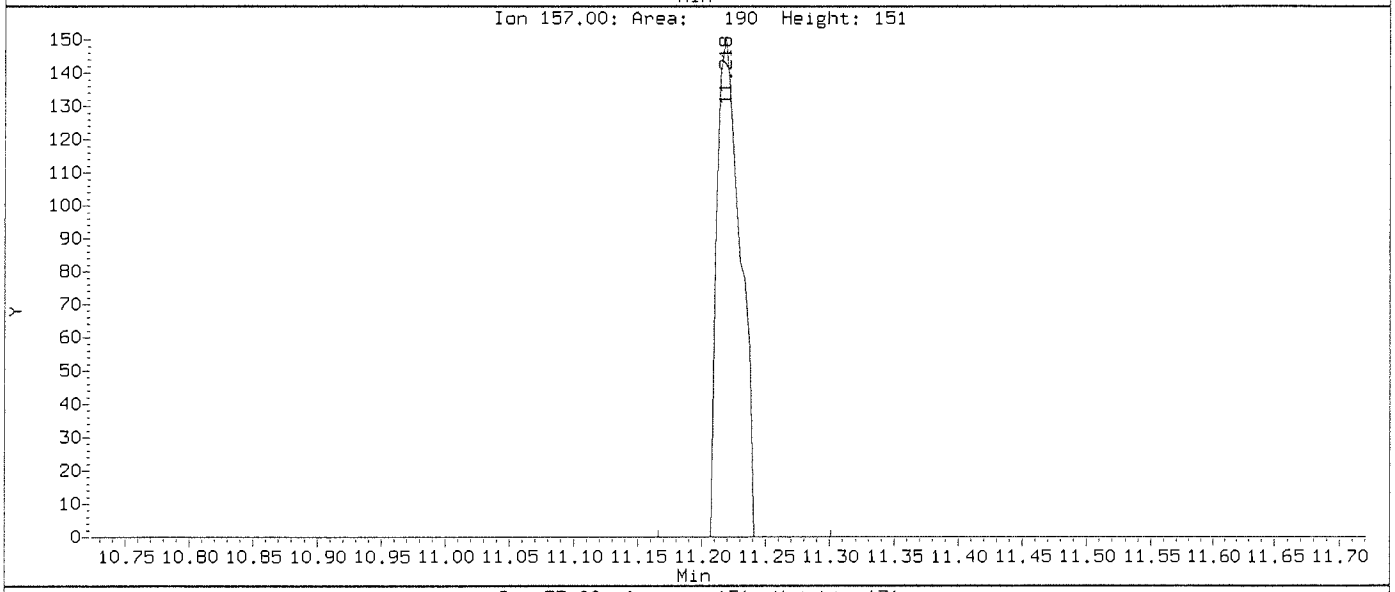
Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8

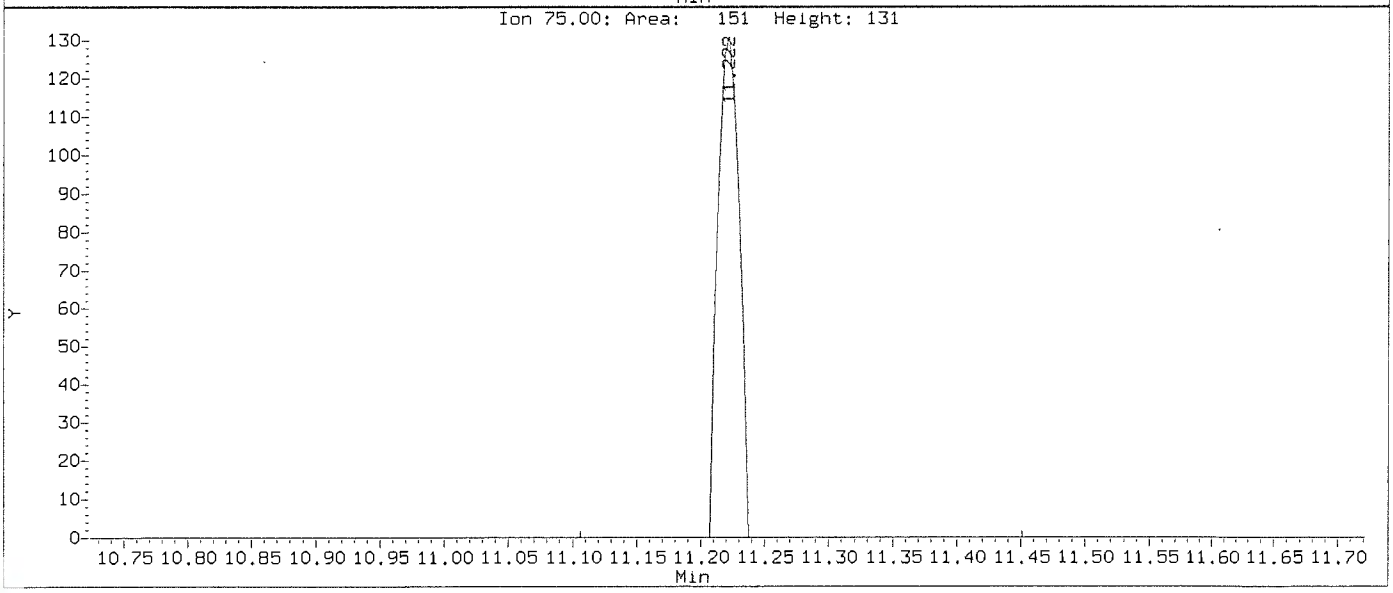


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Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1.2-Dibromo-3-Chloropropane
CAS Number: 96-12-8

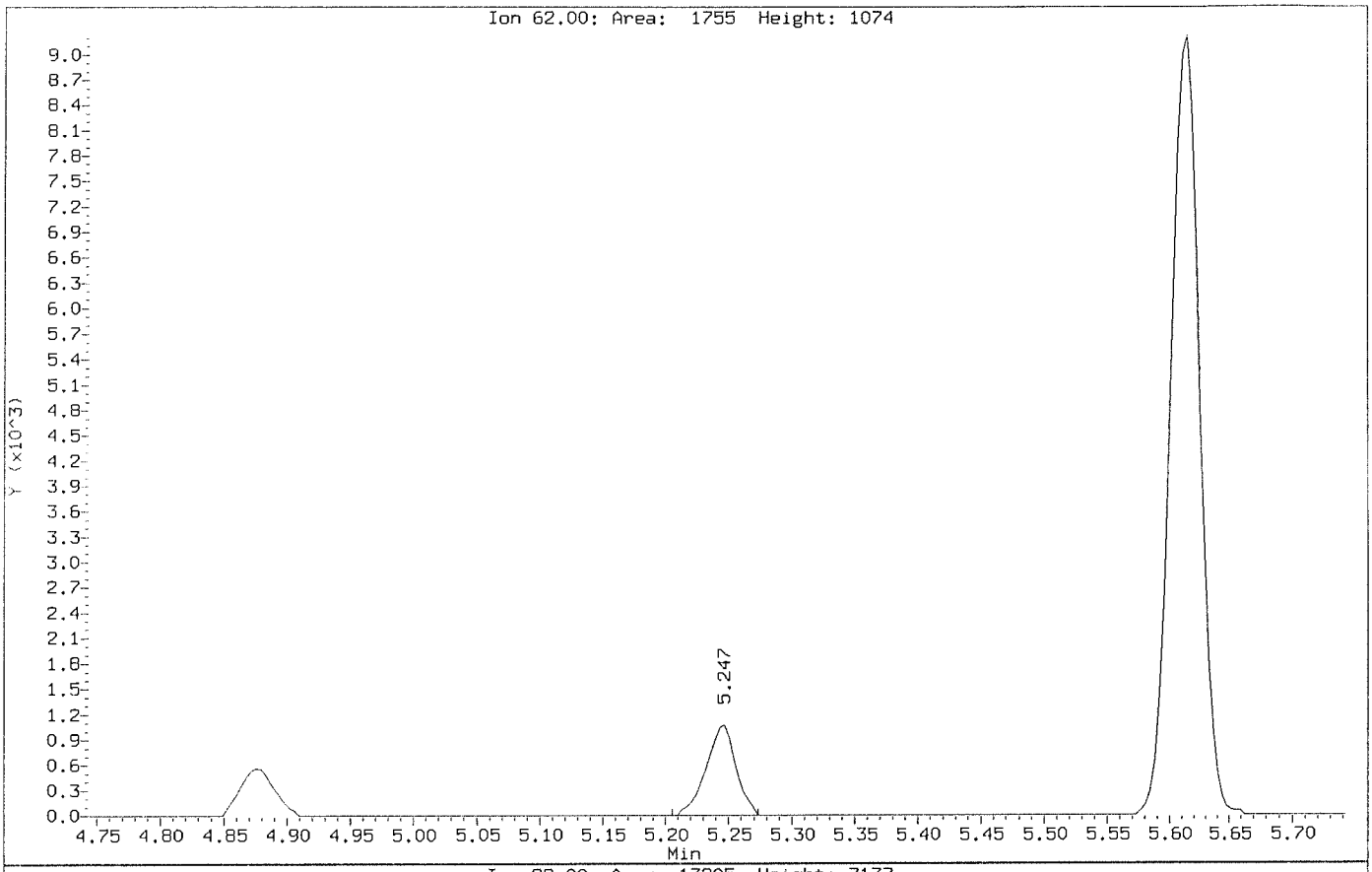


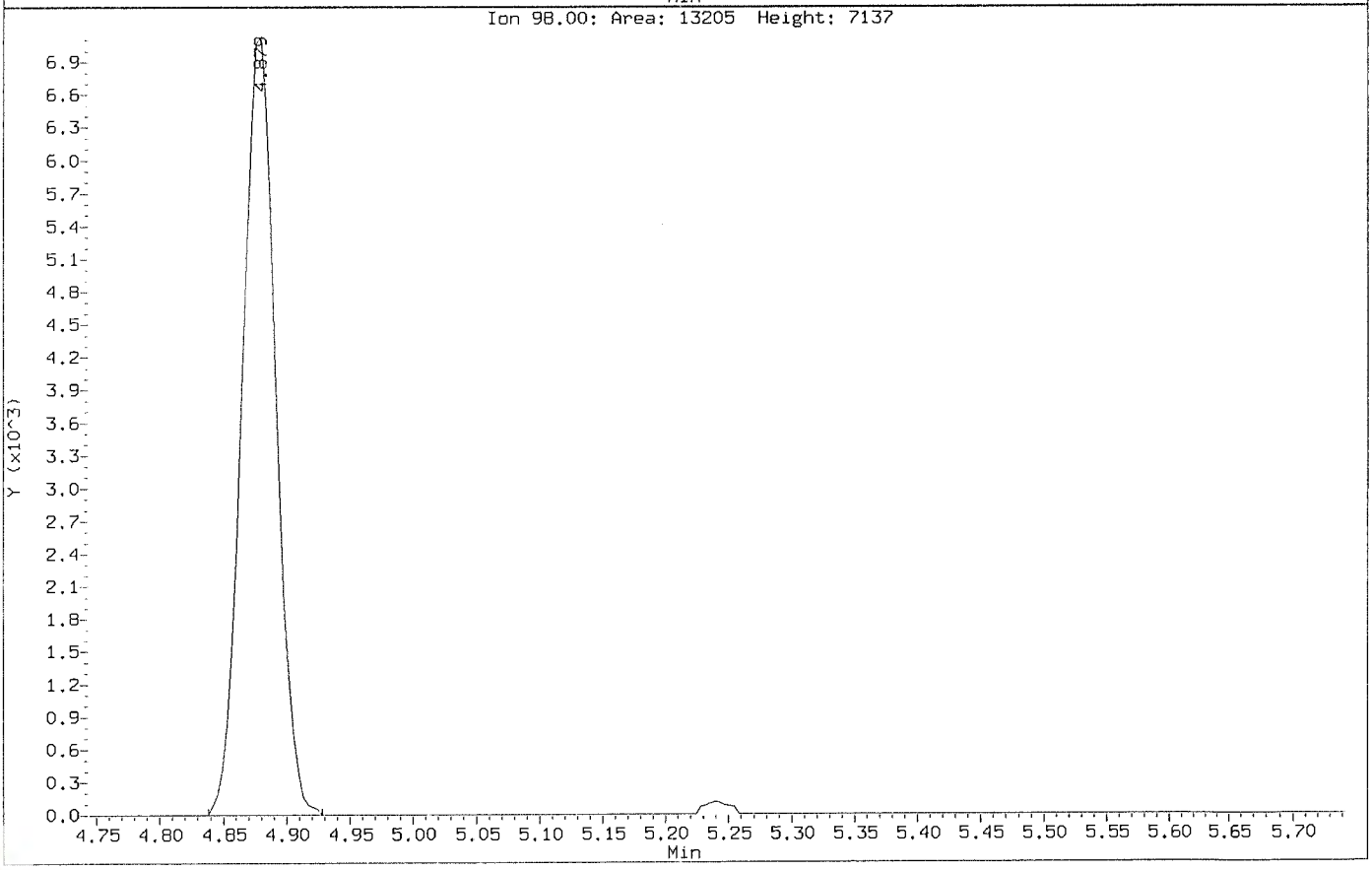




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Client Sample ID: VSTD000.5

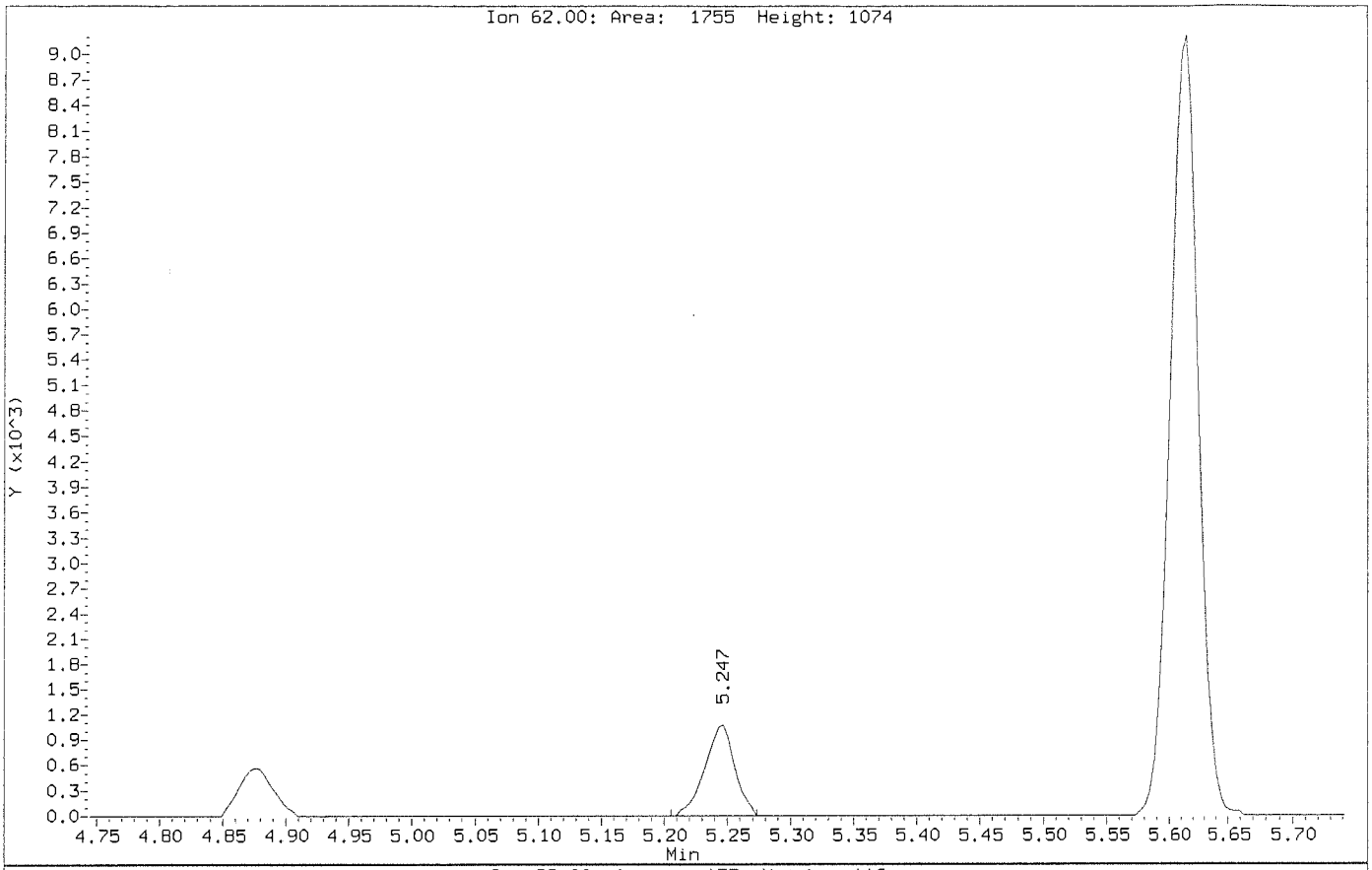
Compound: 1,2-Dichloroethane
CAS Number: 107-06-2

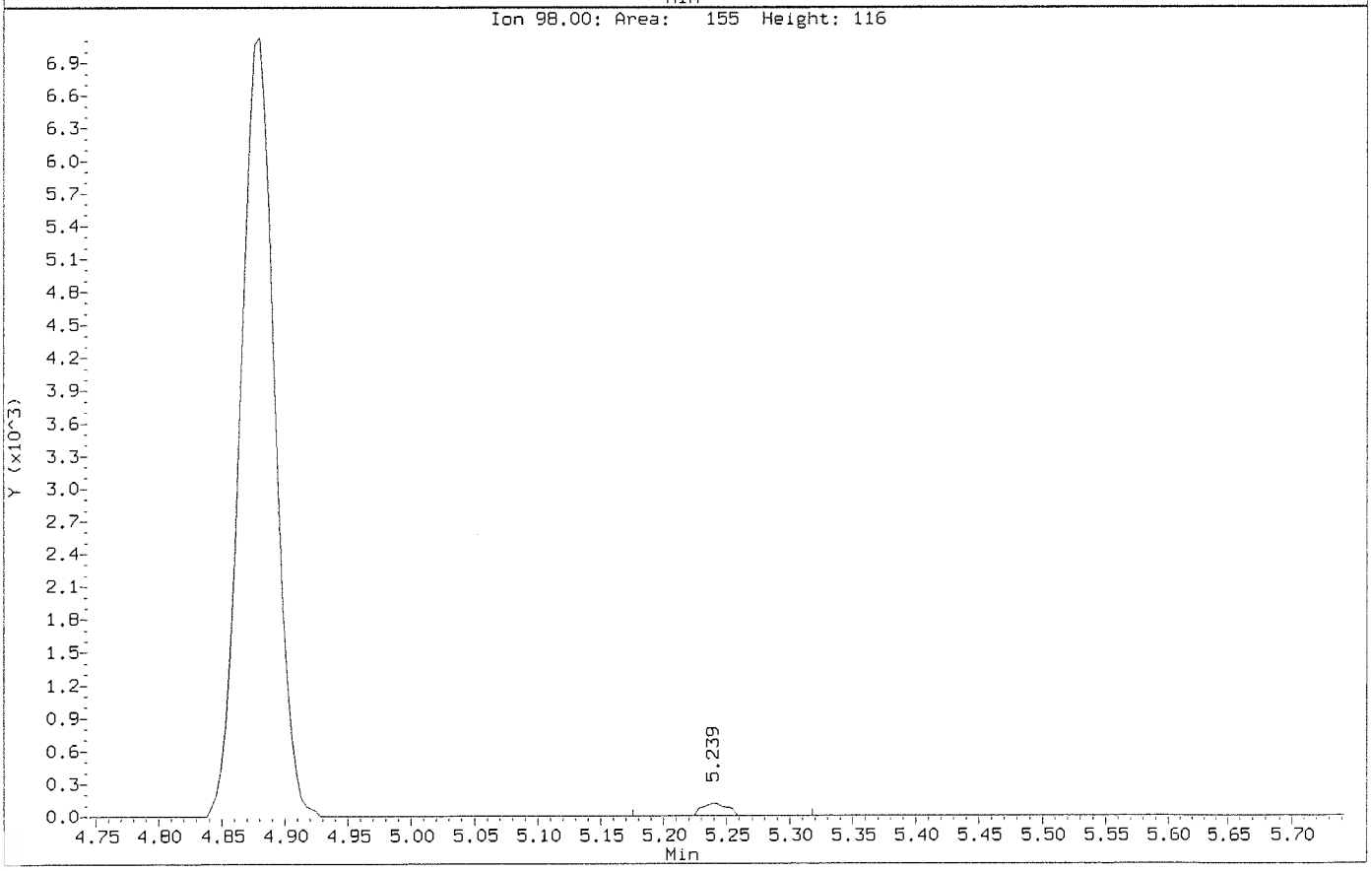




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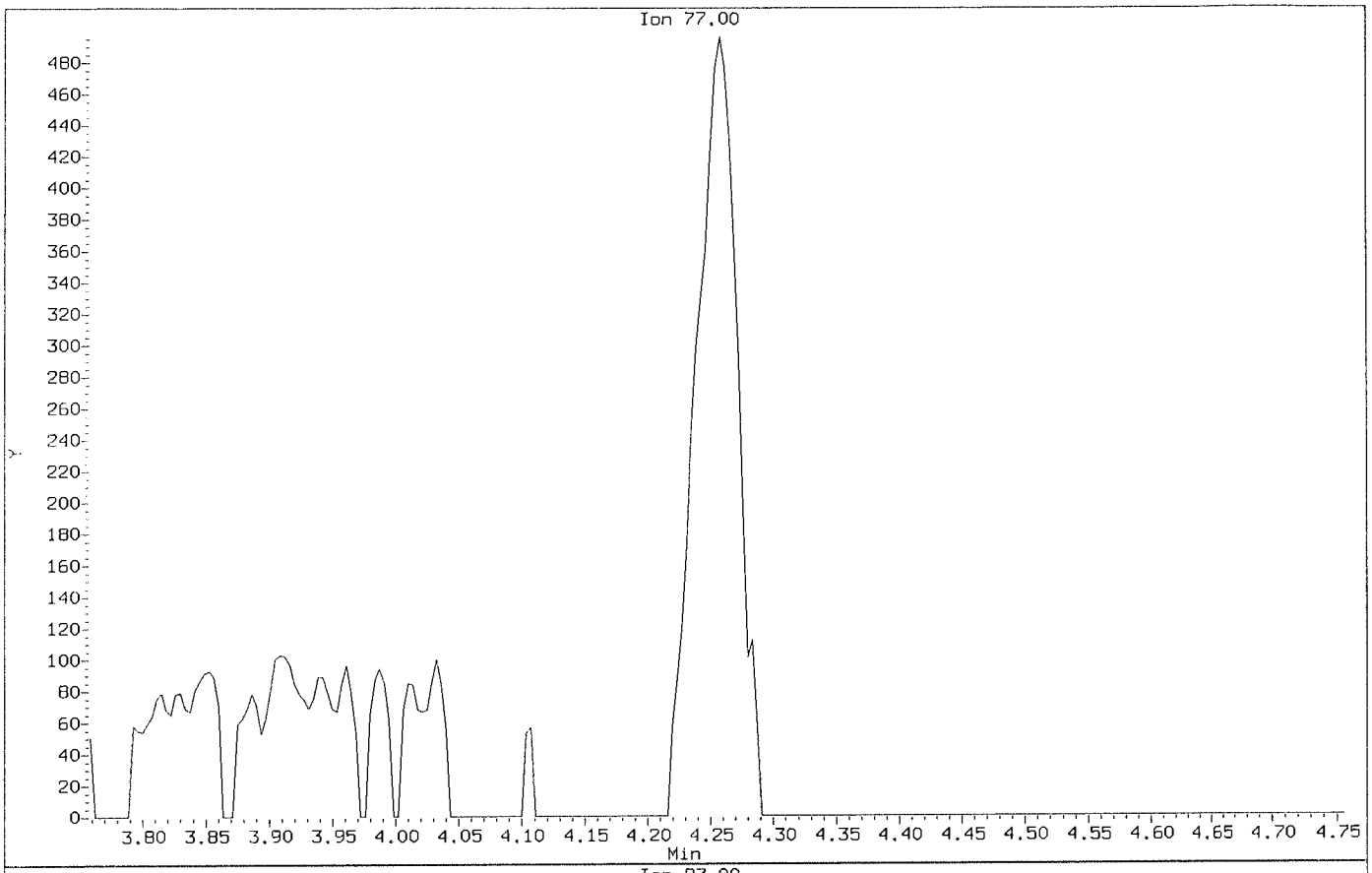
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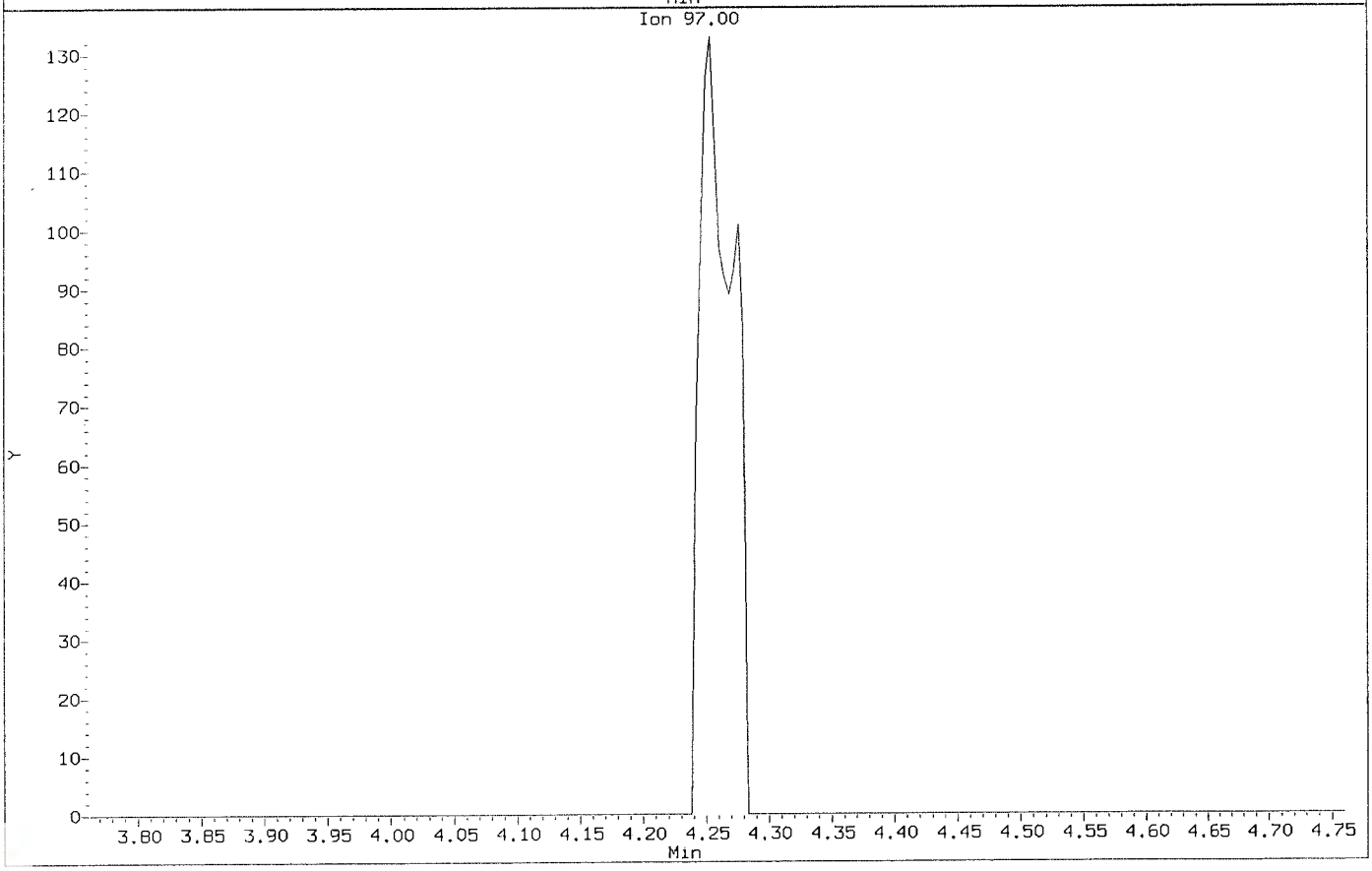




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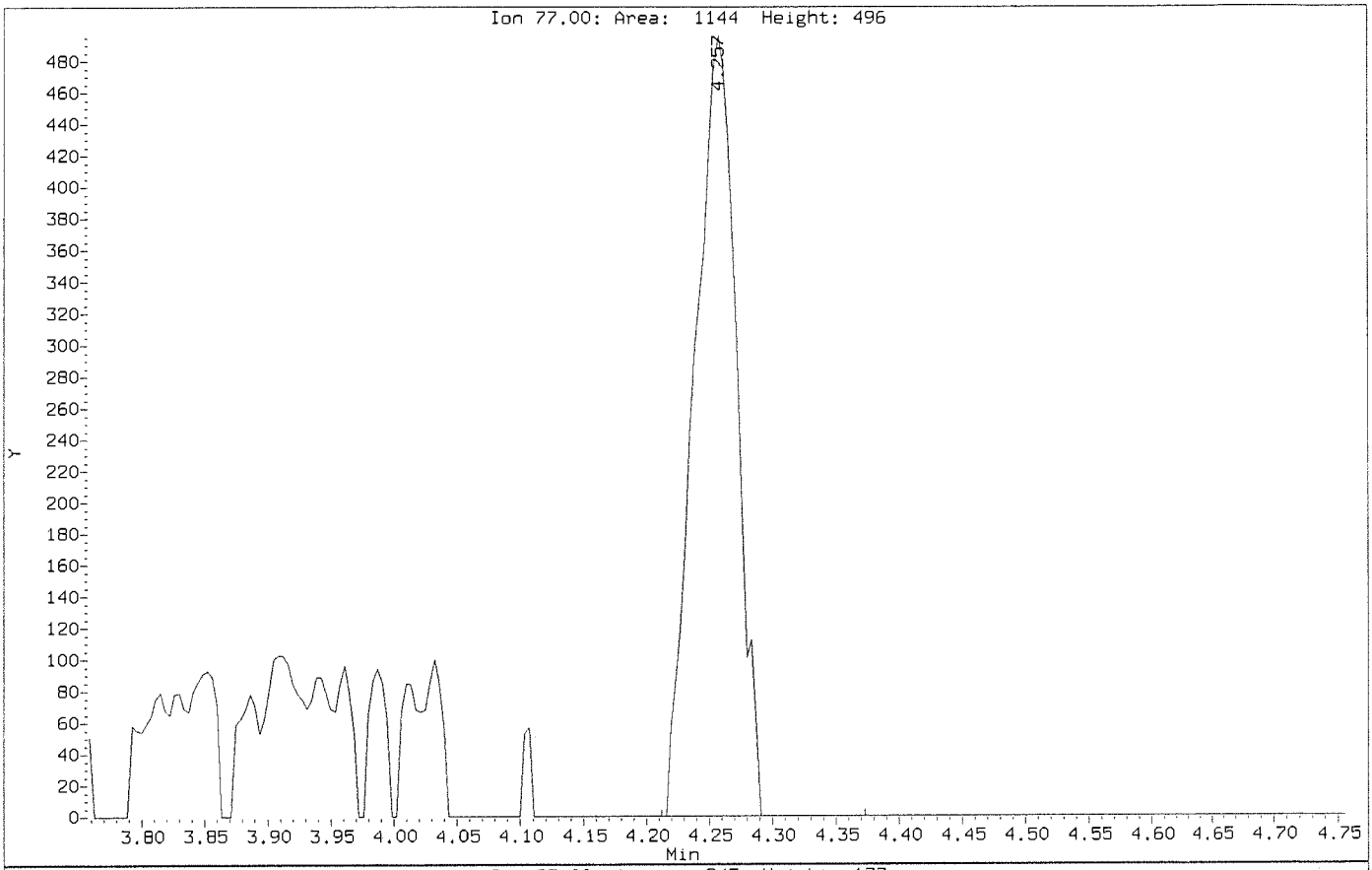
Compound: 2,2-Dichloropropane
CAS Number: 594-20-7

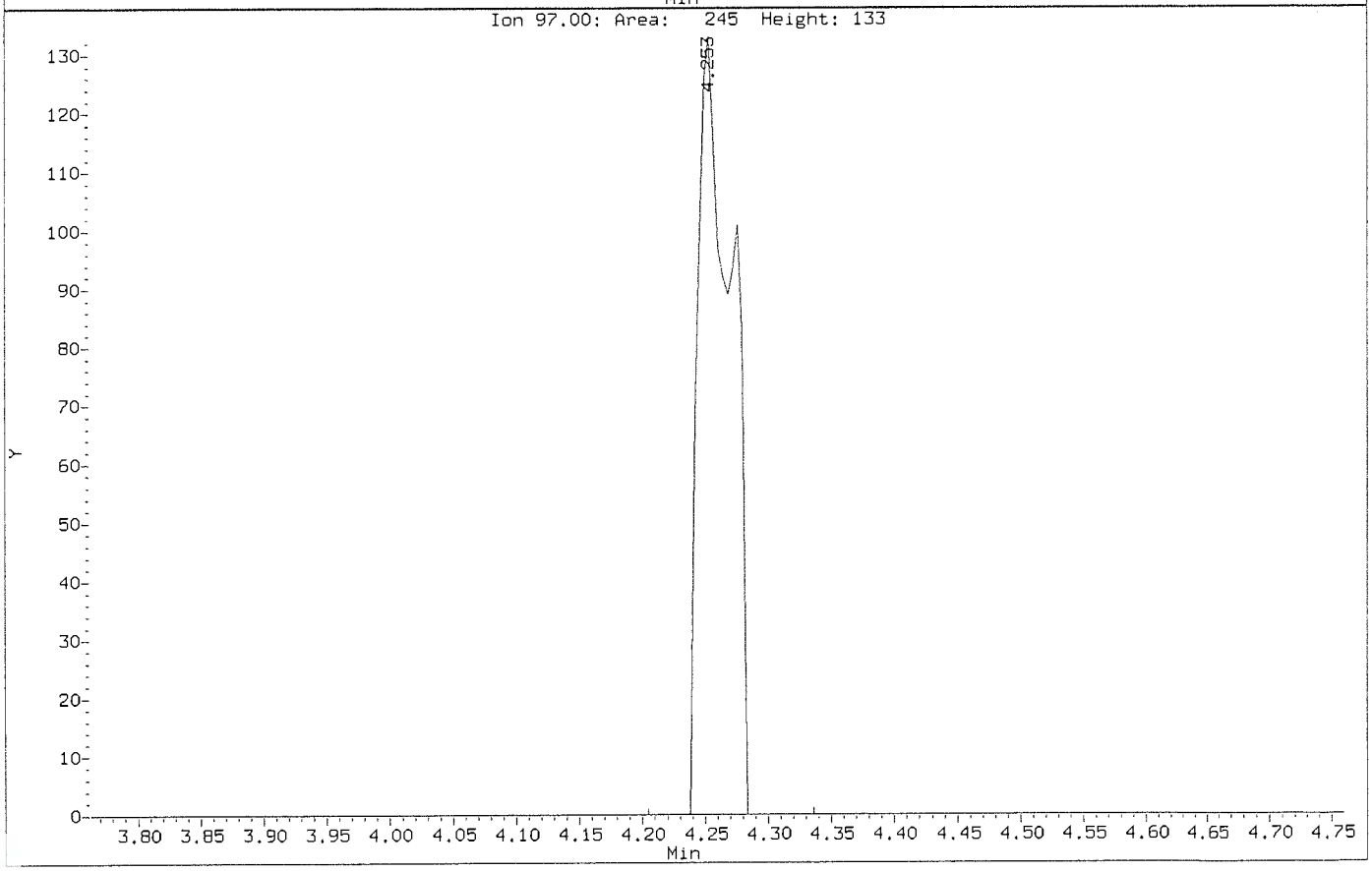




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Instrument: VOA9.i
Client Sample ID: VSTD000.5

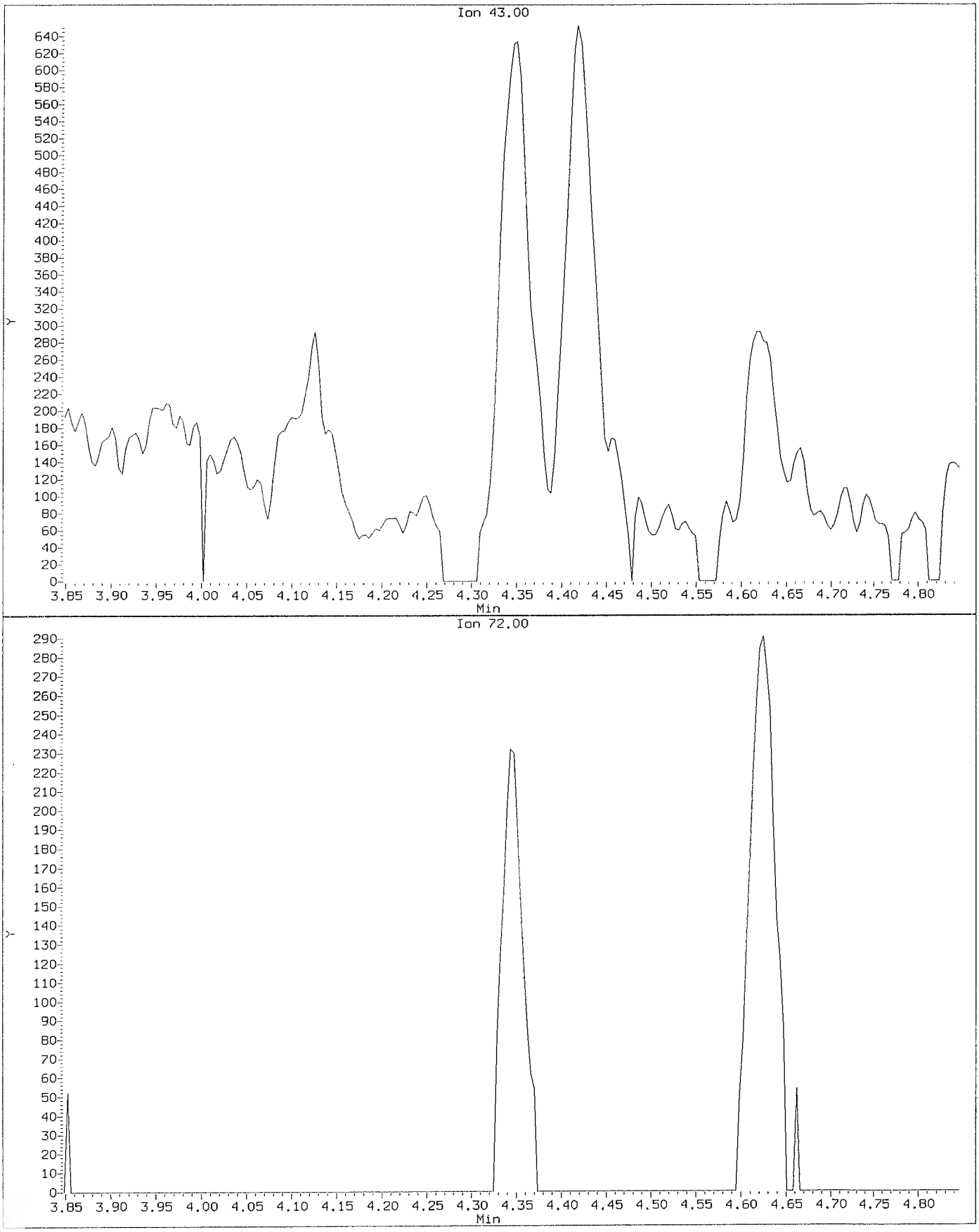
Compound: 2,2-Dichloropropane
CAS Number: 594-20-7





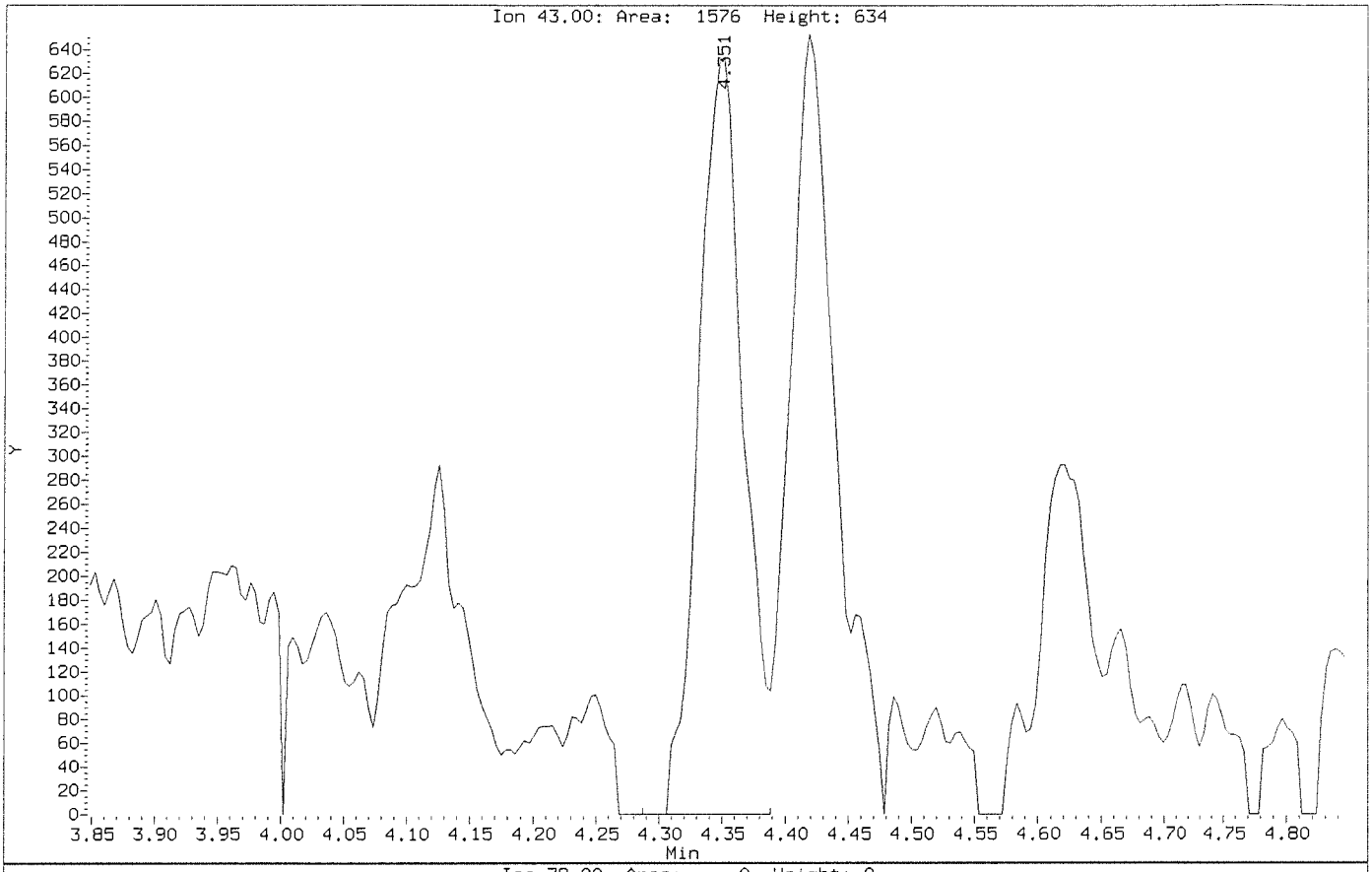
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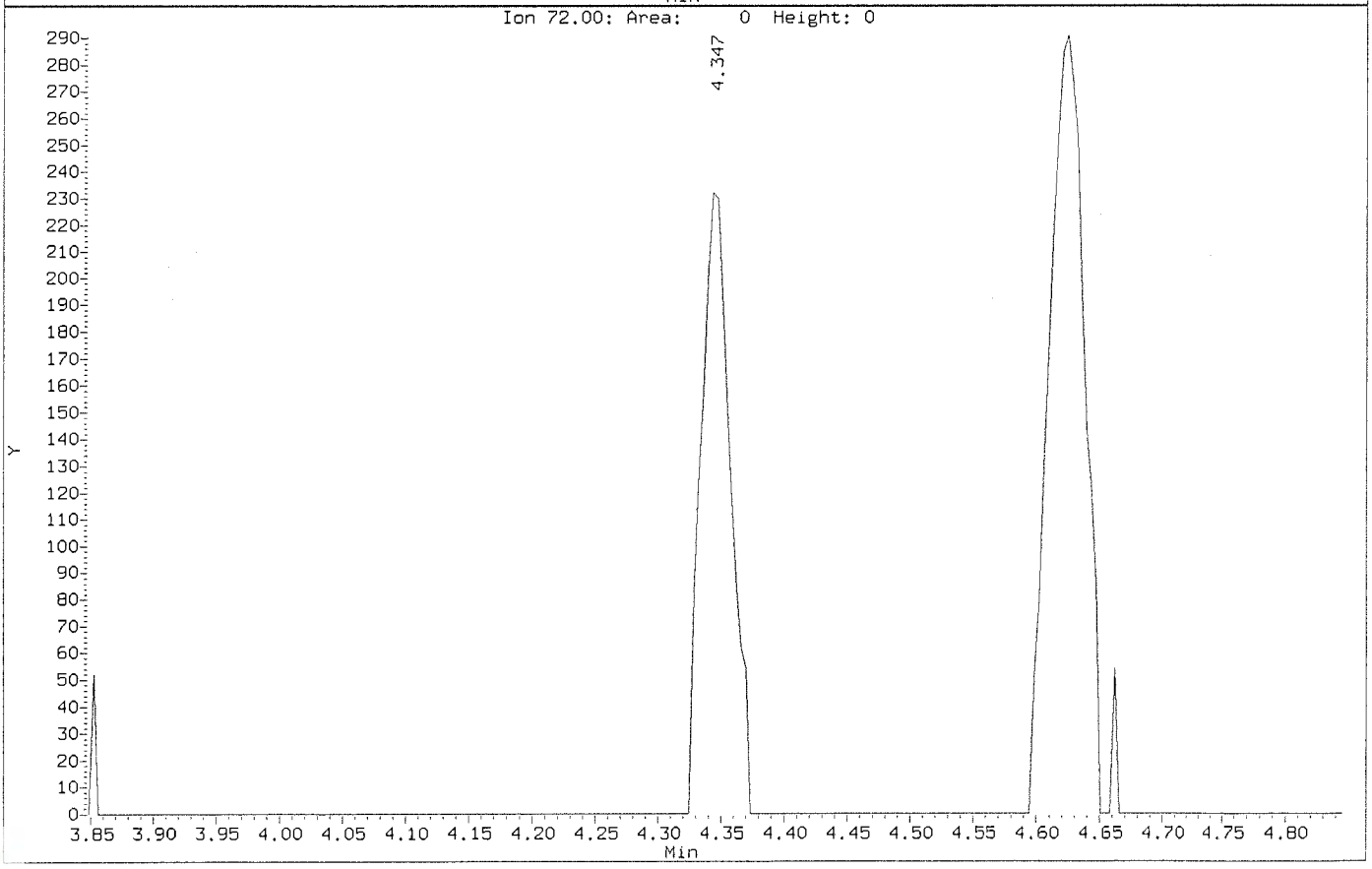
Compound: 2-Butanone
CAS Number: 78-93-3



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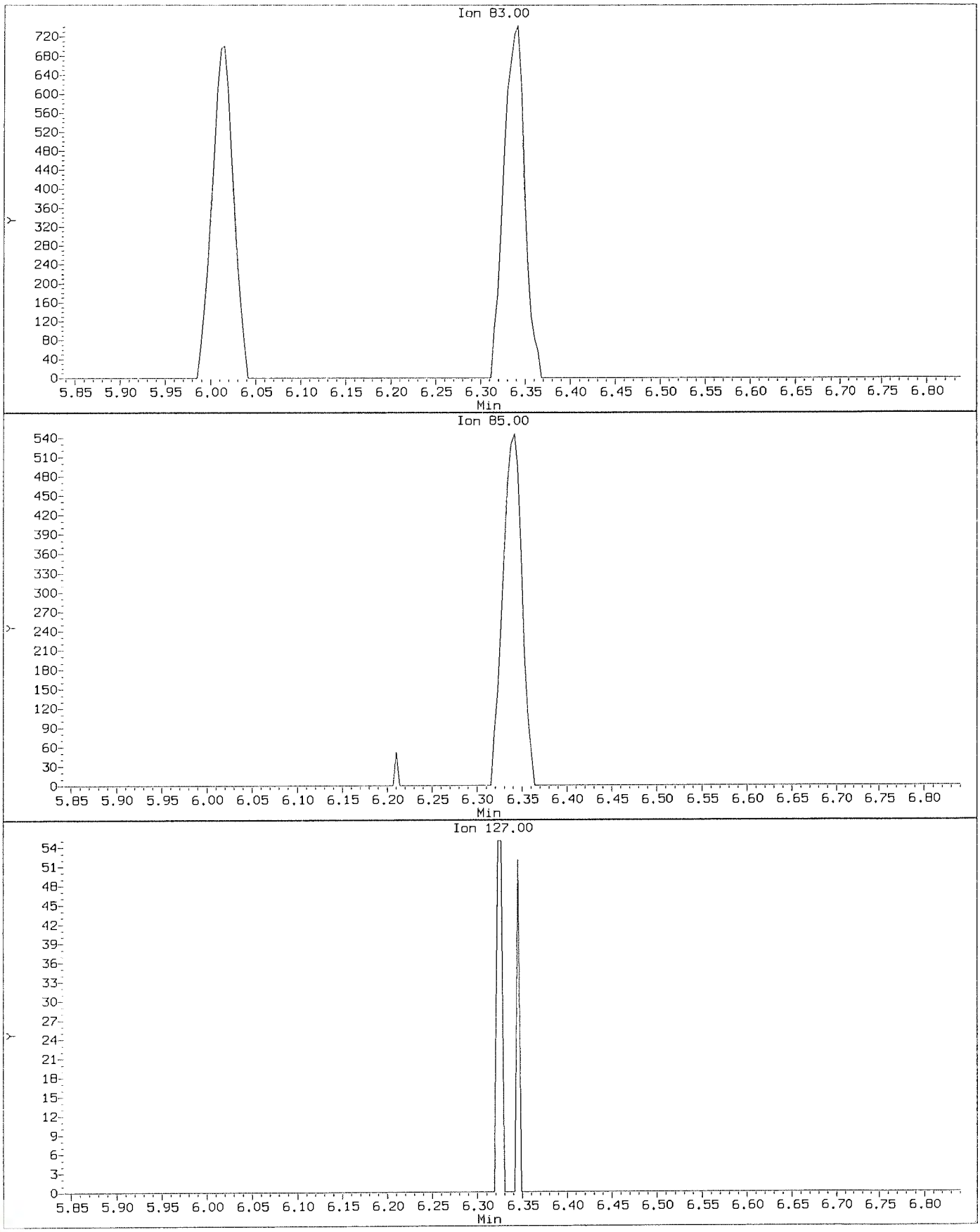
Compound: 2-Butanone
CAS Number: 78-93-3





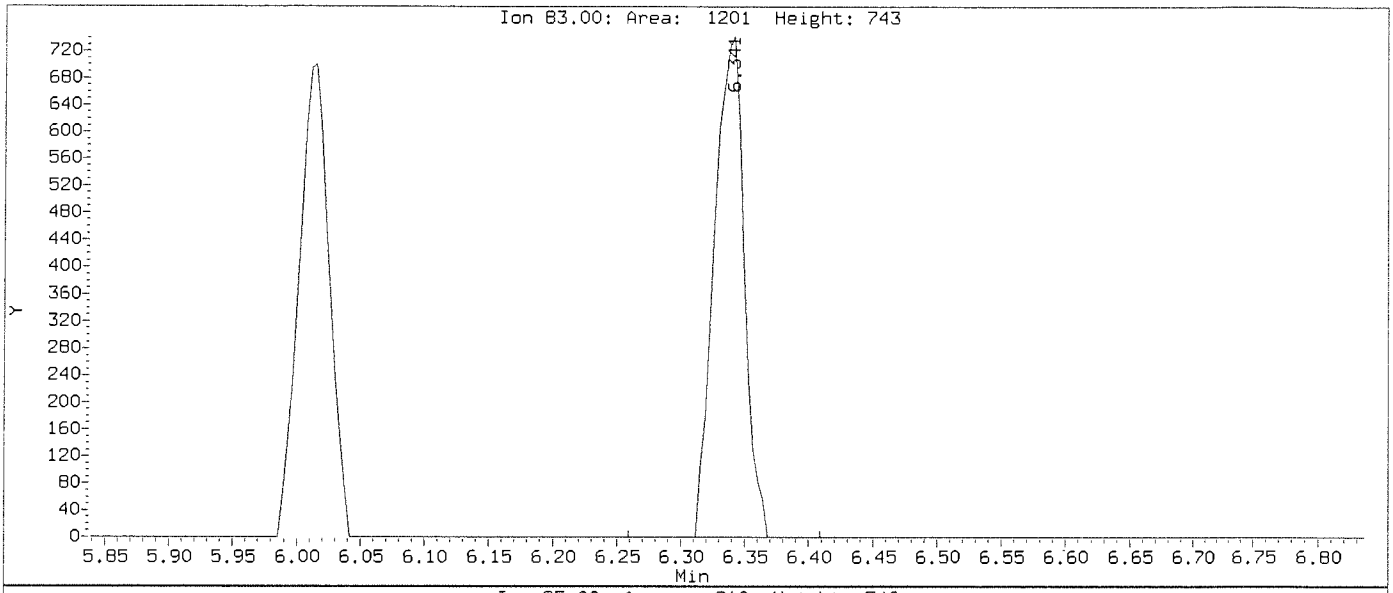
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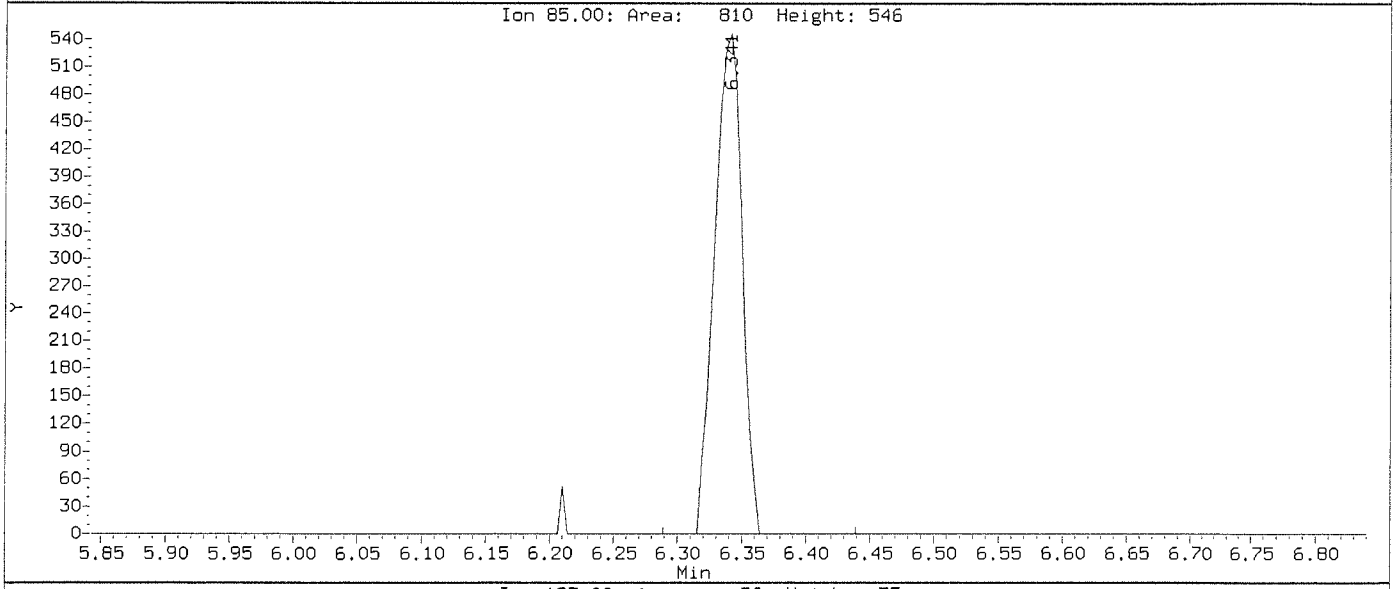
Compound: Bromodichloromethane
CAS Number: 75-27-4

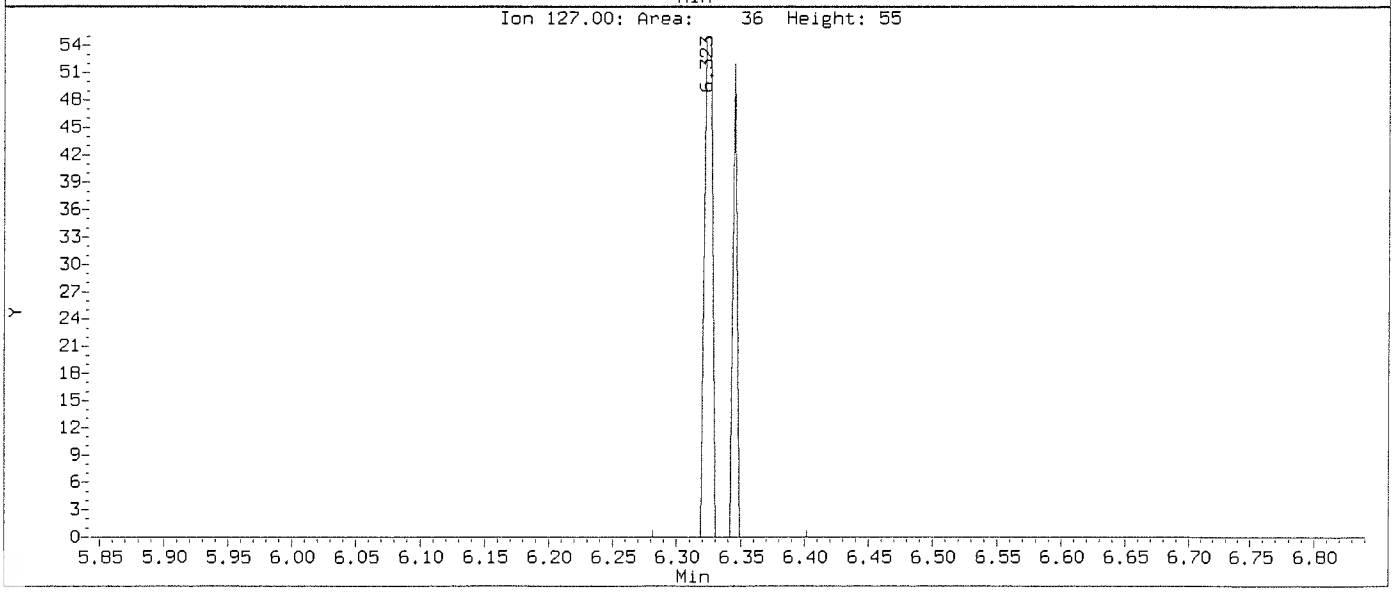


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Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Bromodichloromethane
CAS Number: 75-27-4

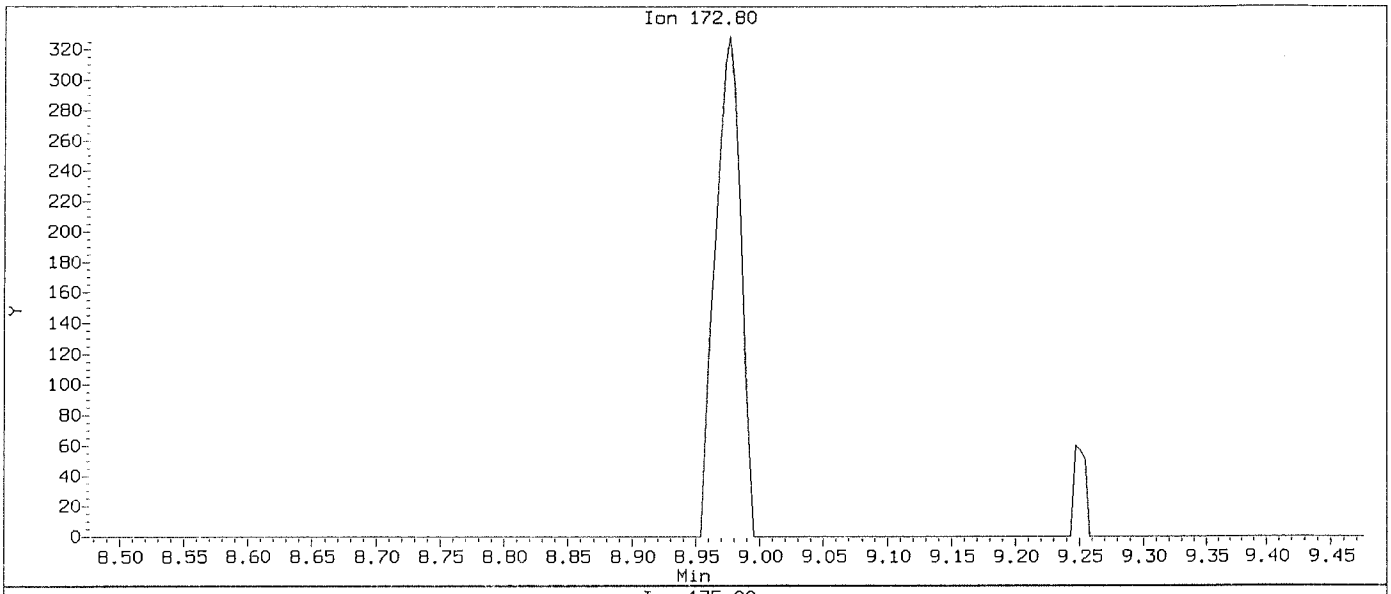


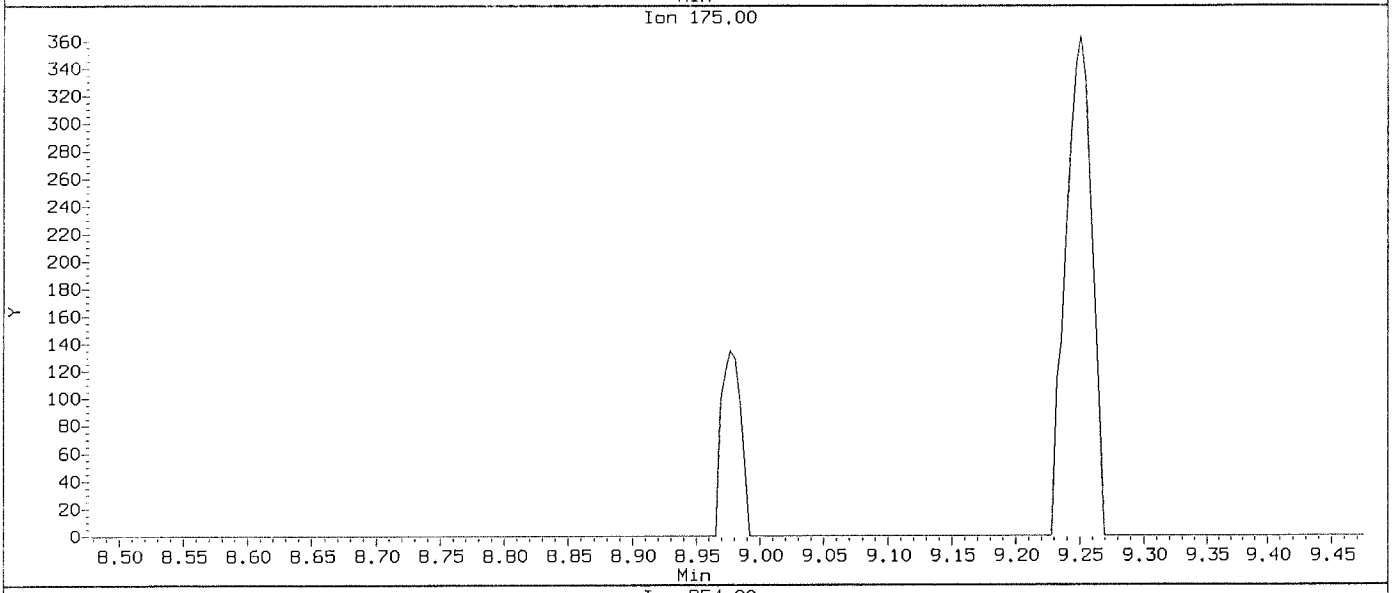


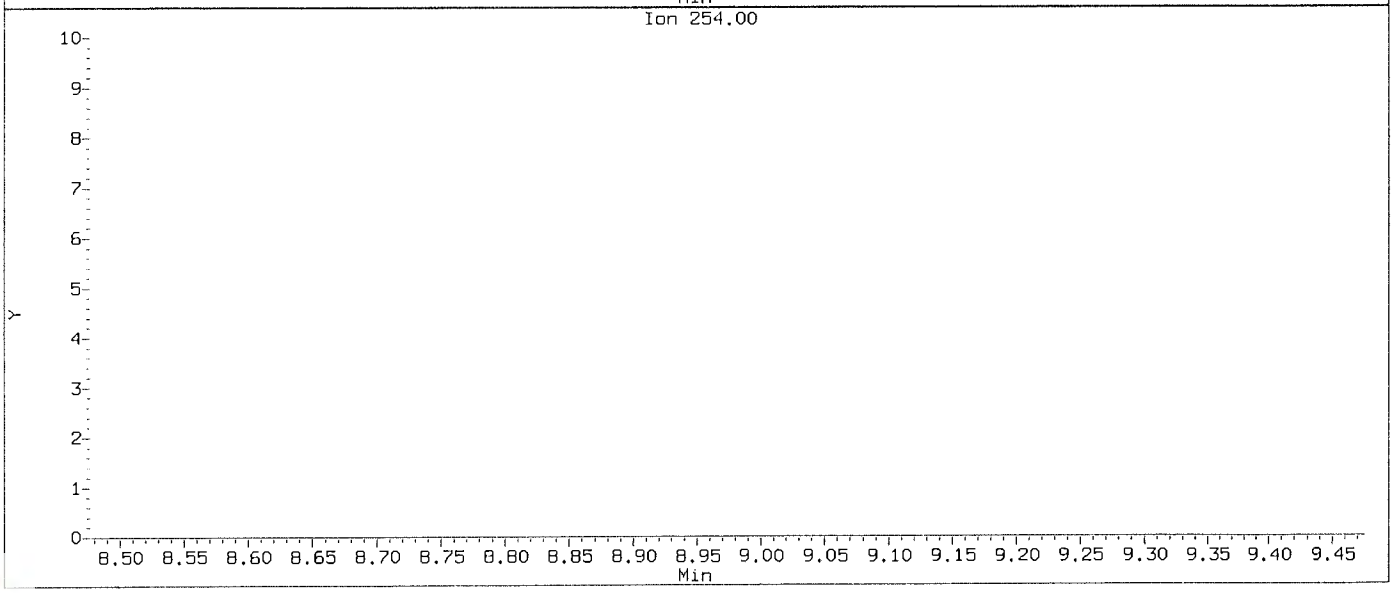


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Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Bromoform
CAS Number: 75-25-2

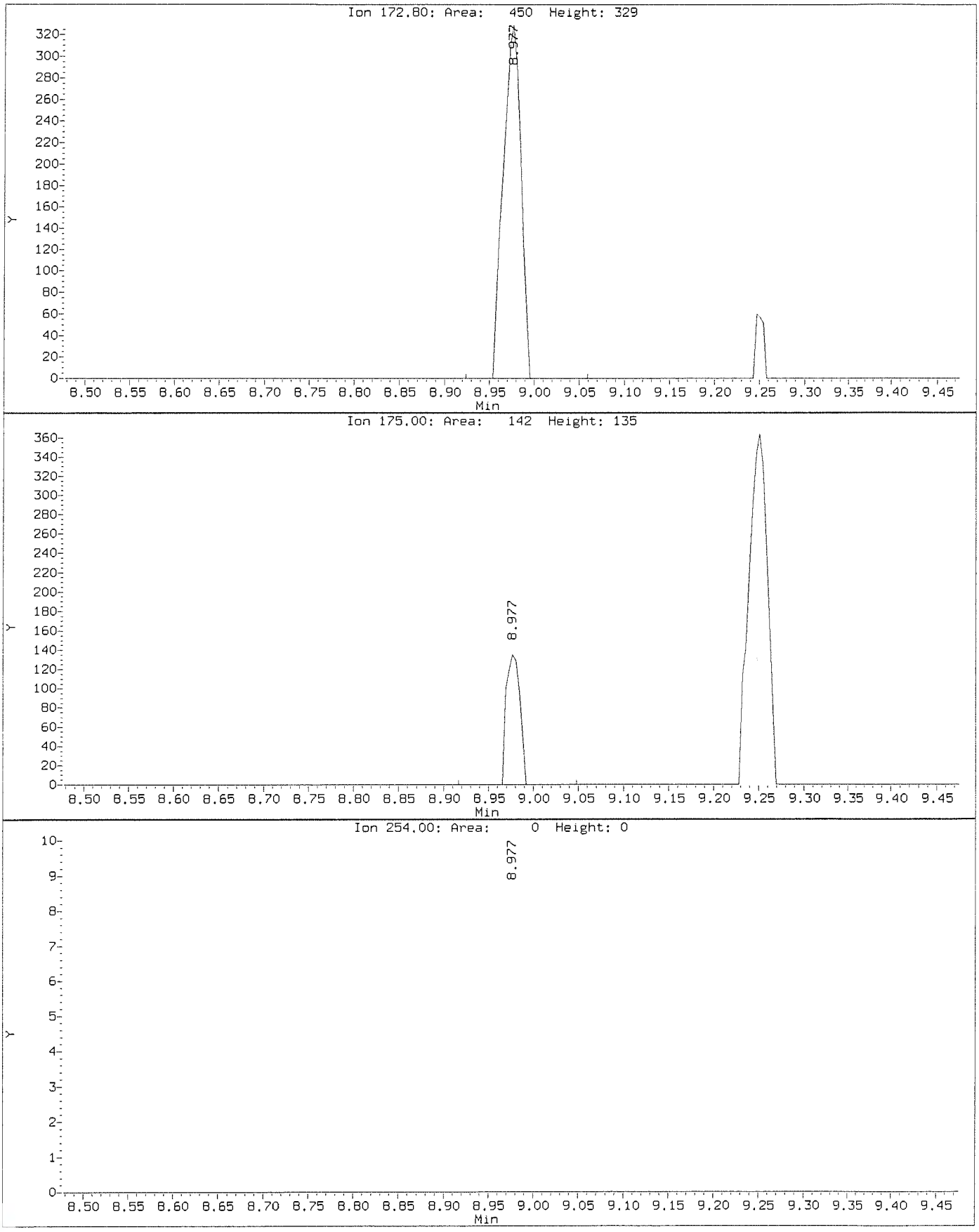






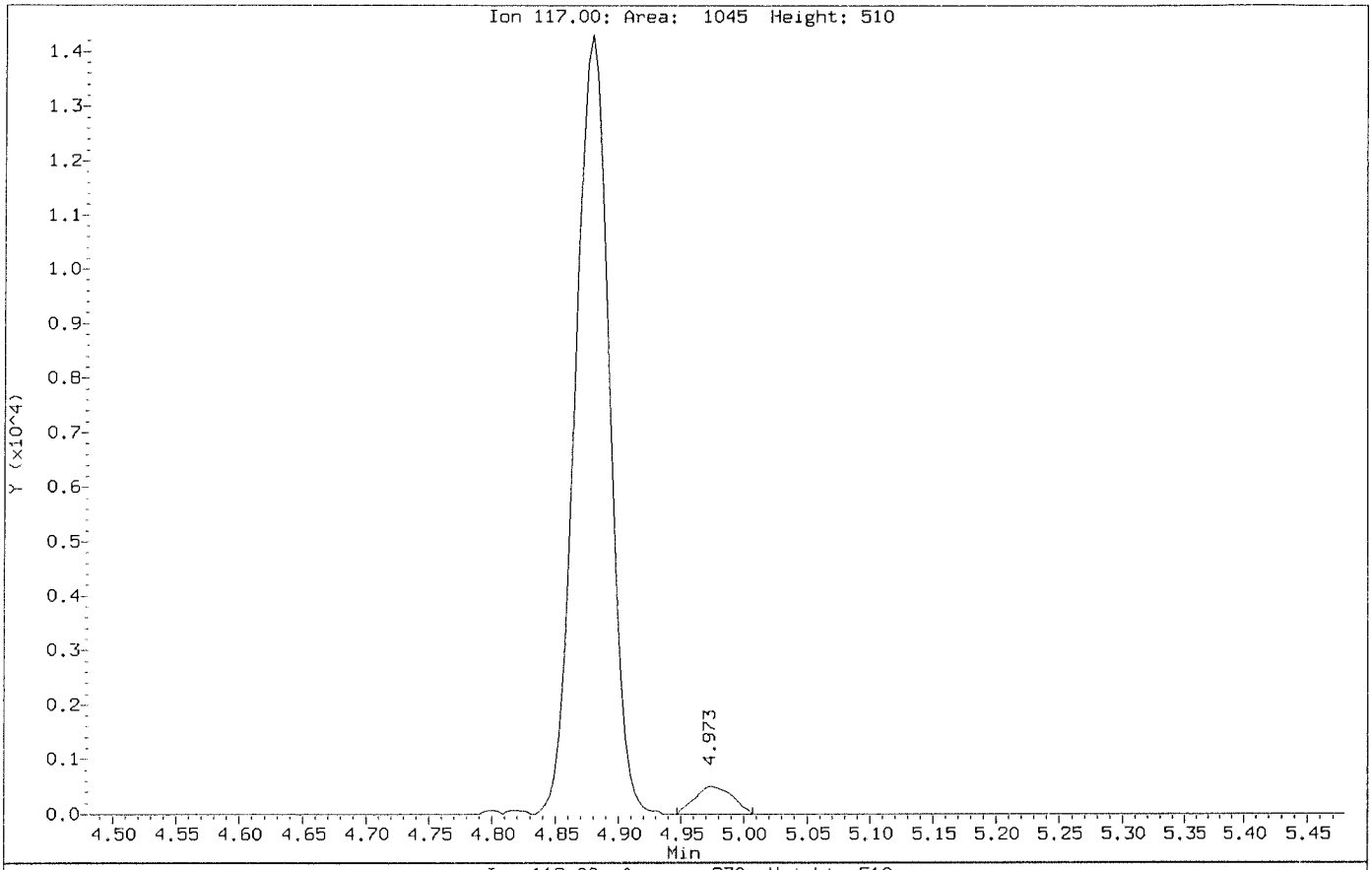
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Client Sample ID: VSTD000.5

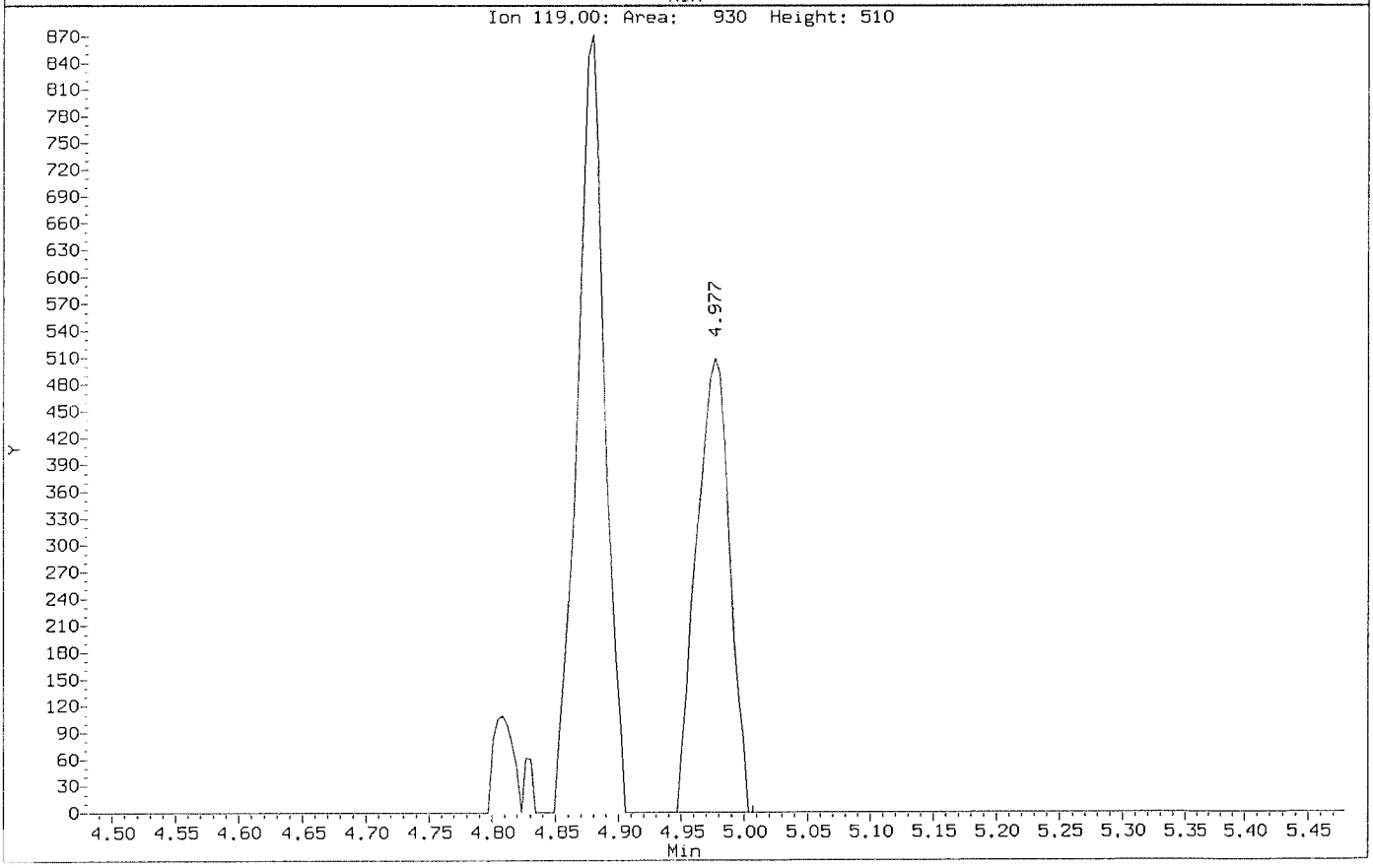
Compound: Bromoform
CAS Number: 75-25-2



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111503.D
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Instrument: VOA9.i
Client Sample ID: VSTD000.5

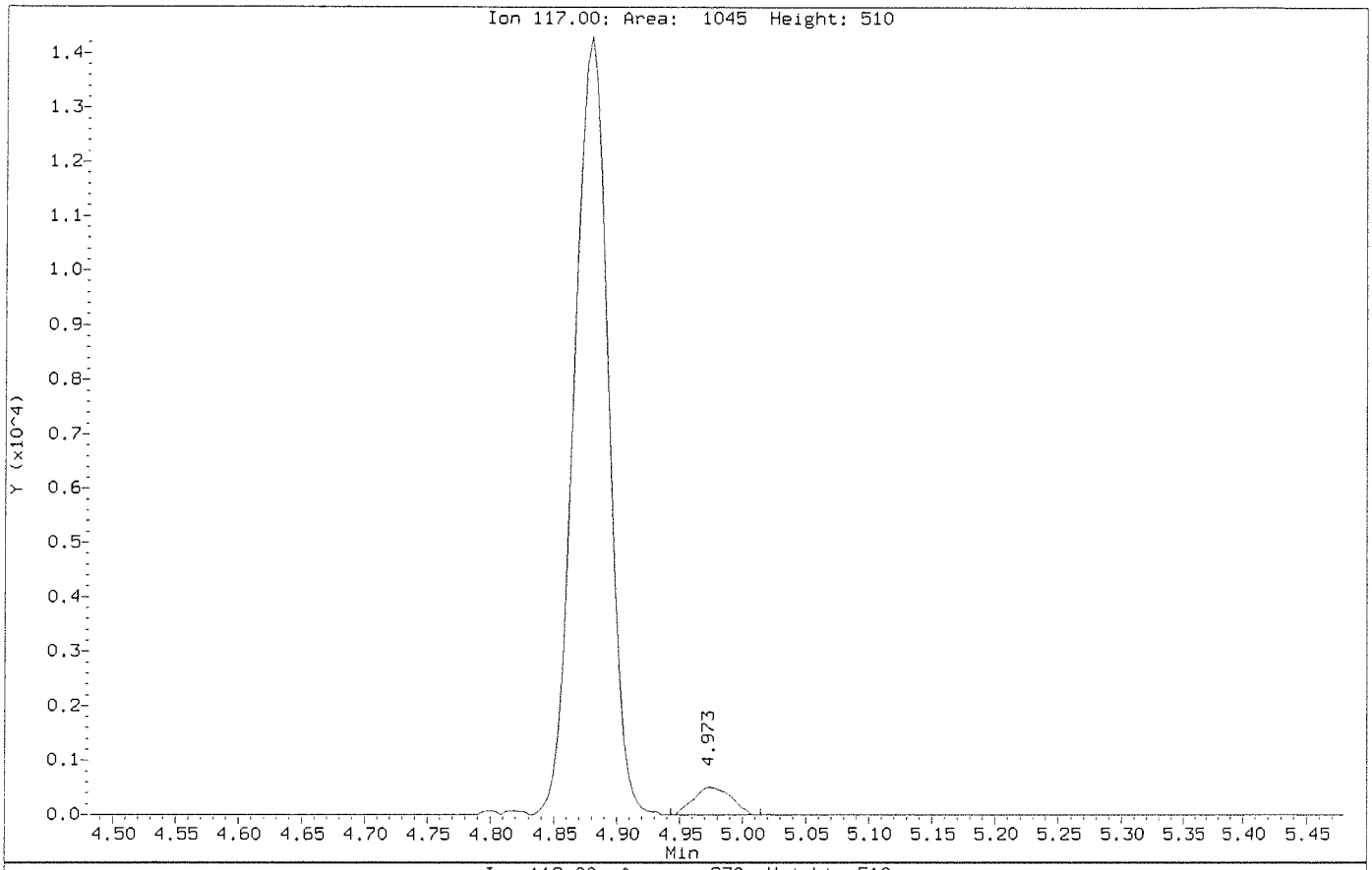
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

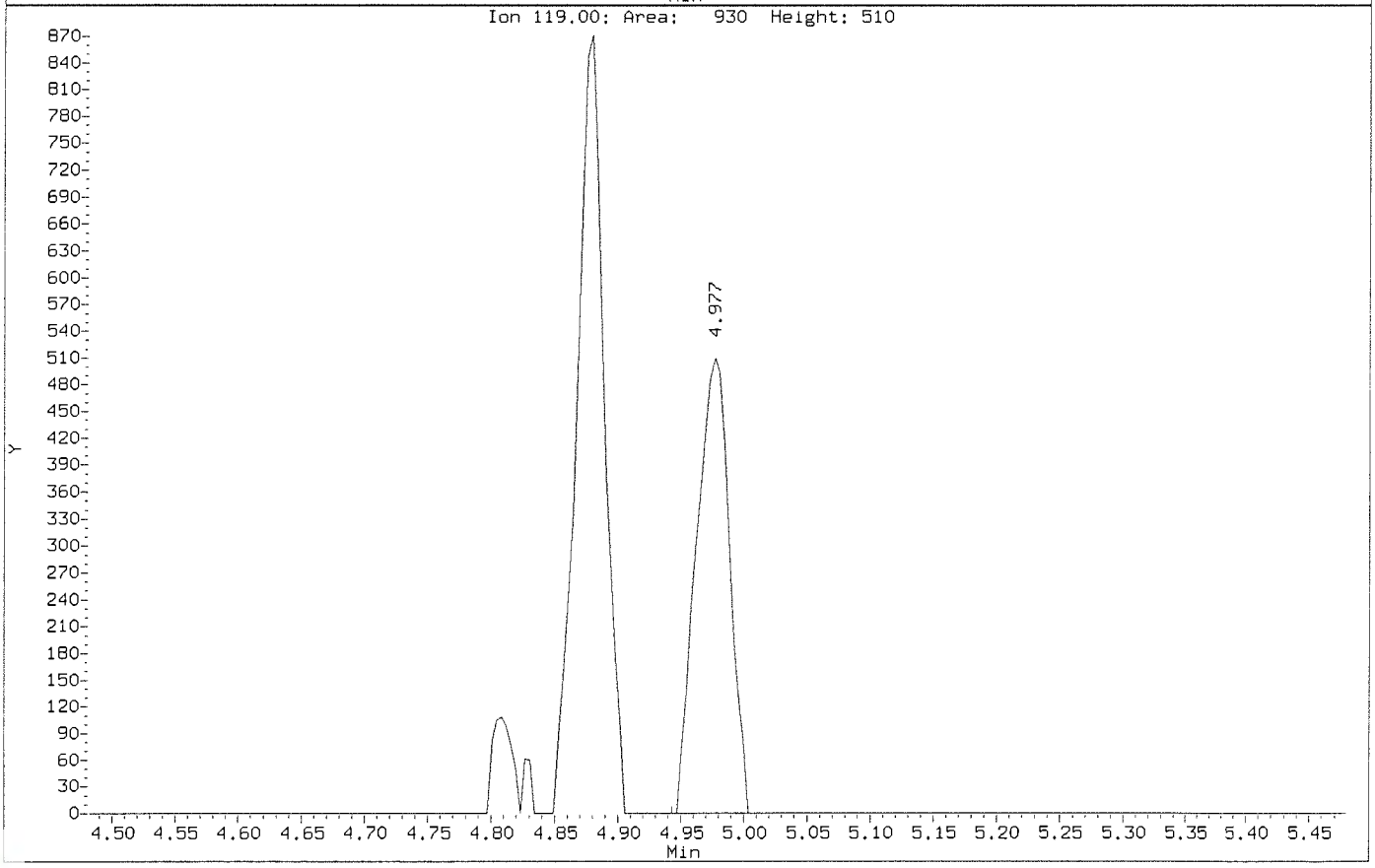




Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111503.D
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

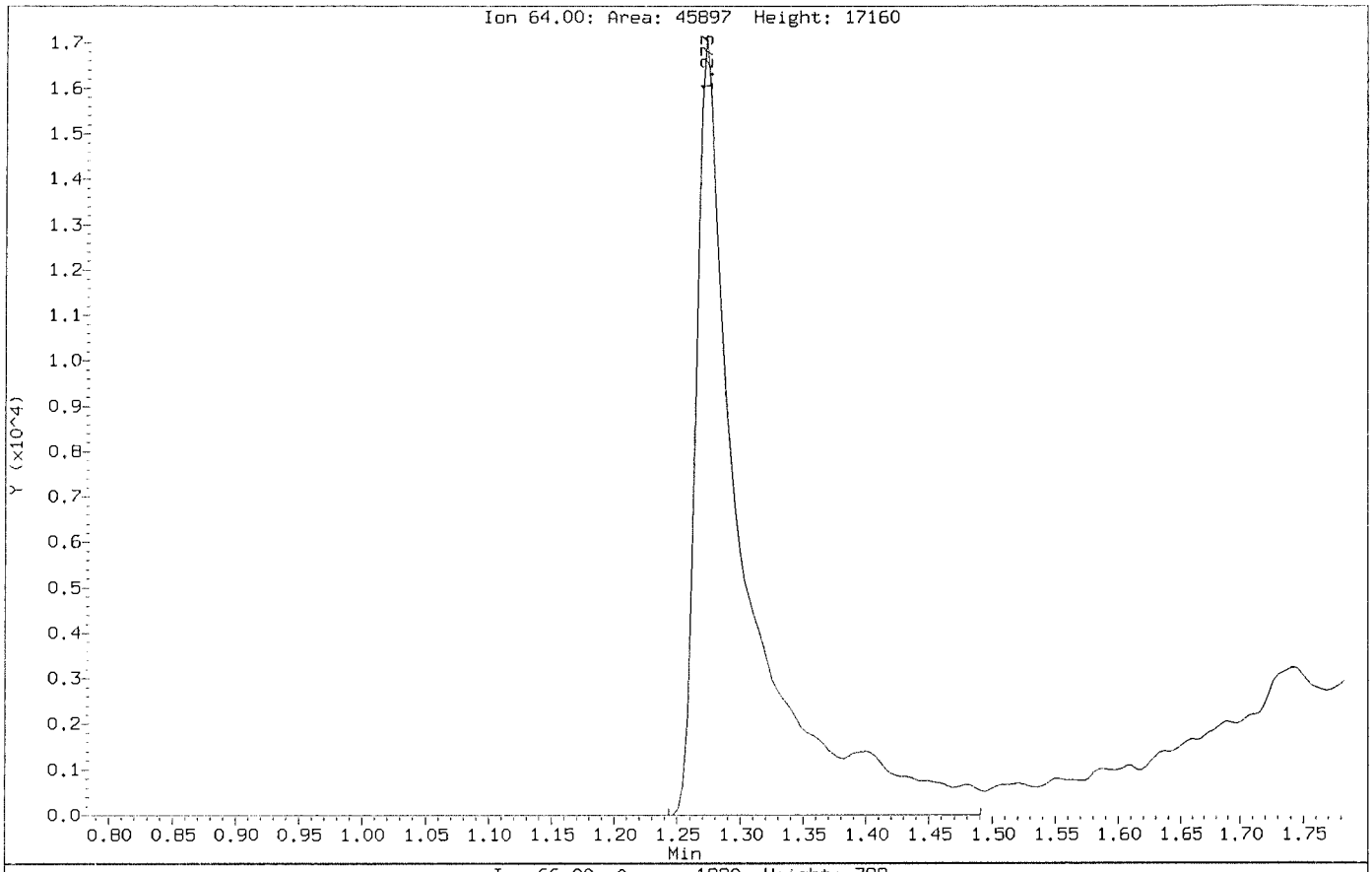
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

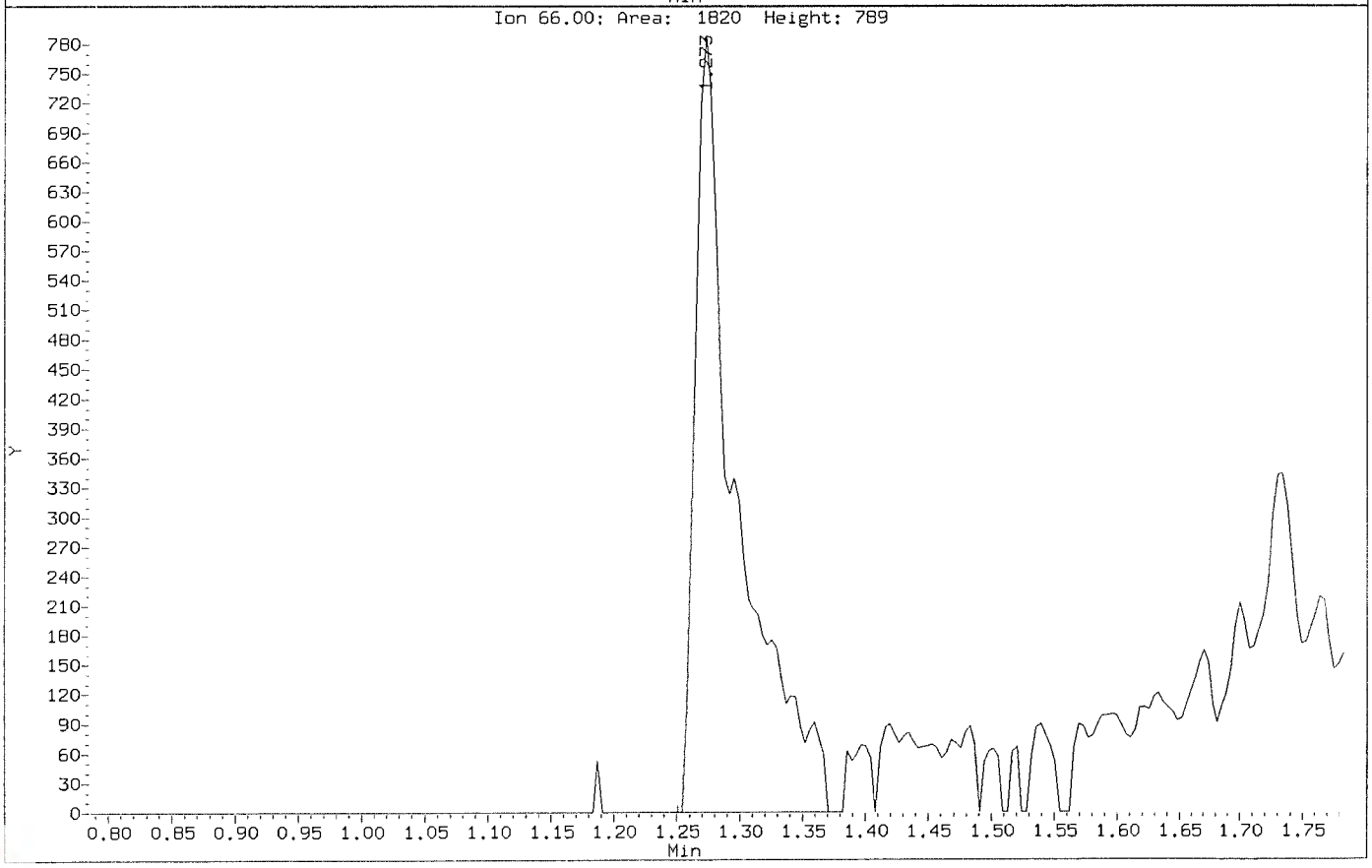




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Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

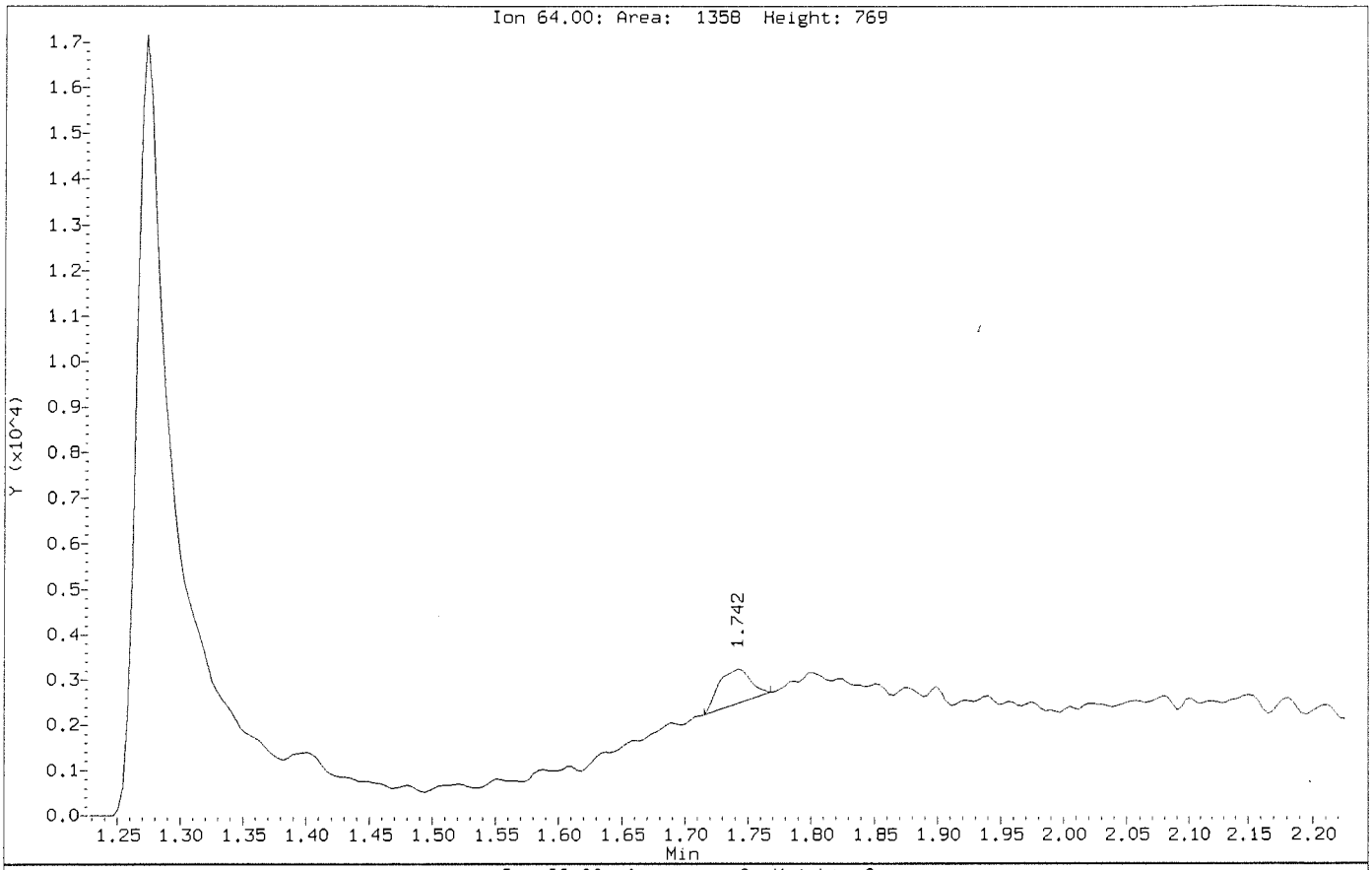
Compound: Chloroethane
CAS Number: 75-00-3

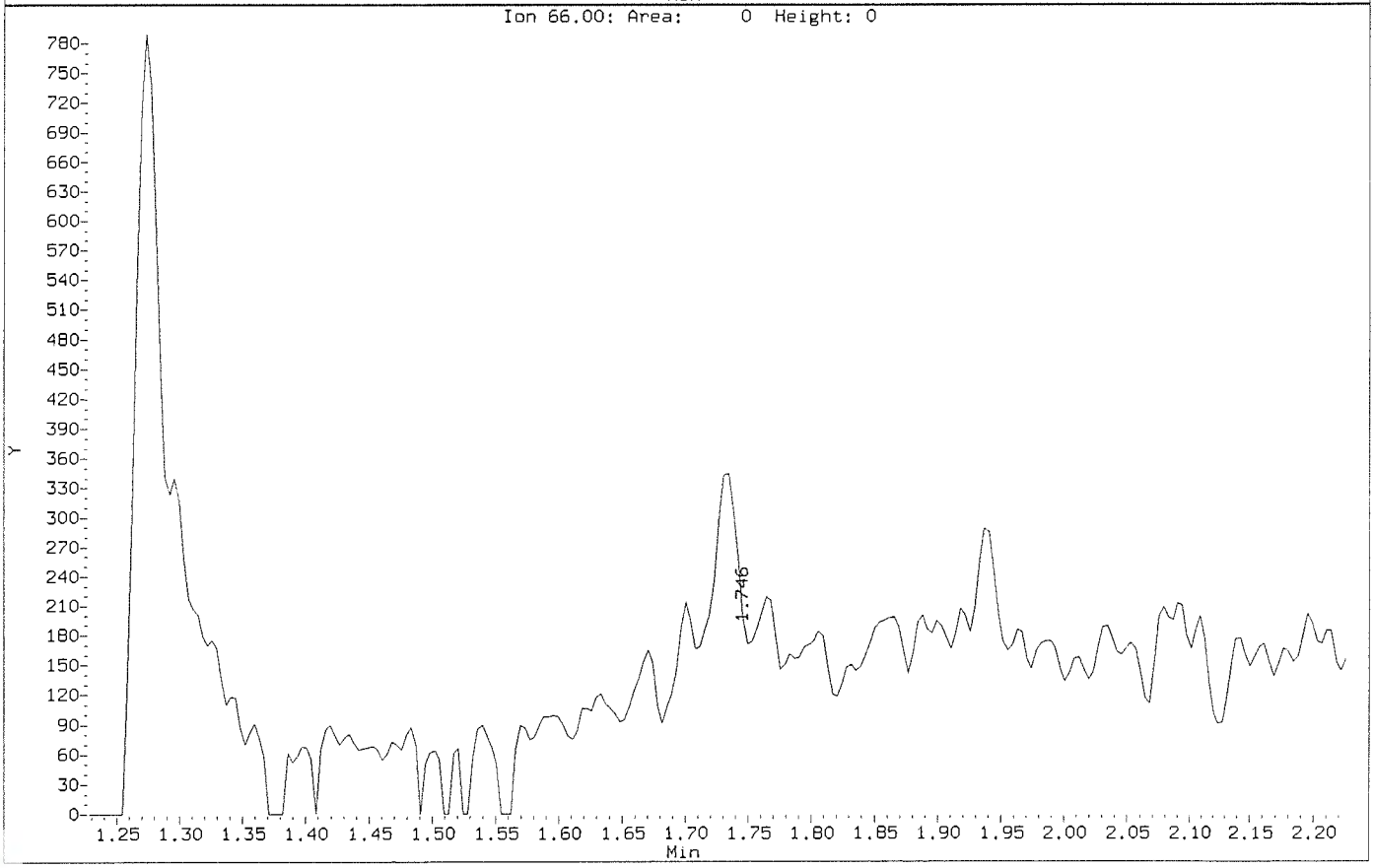




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Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

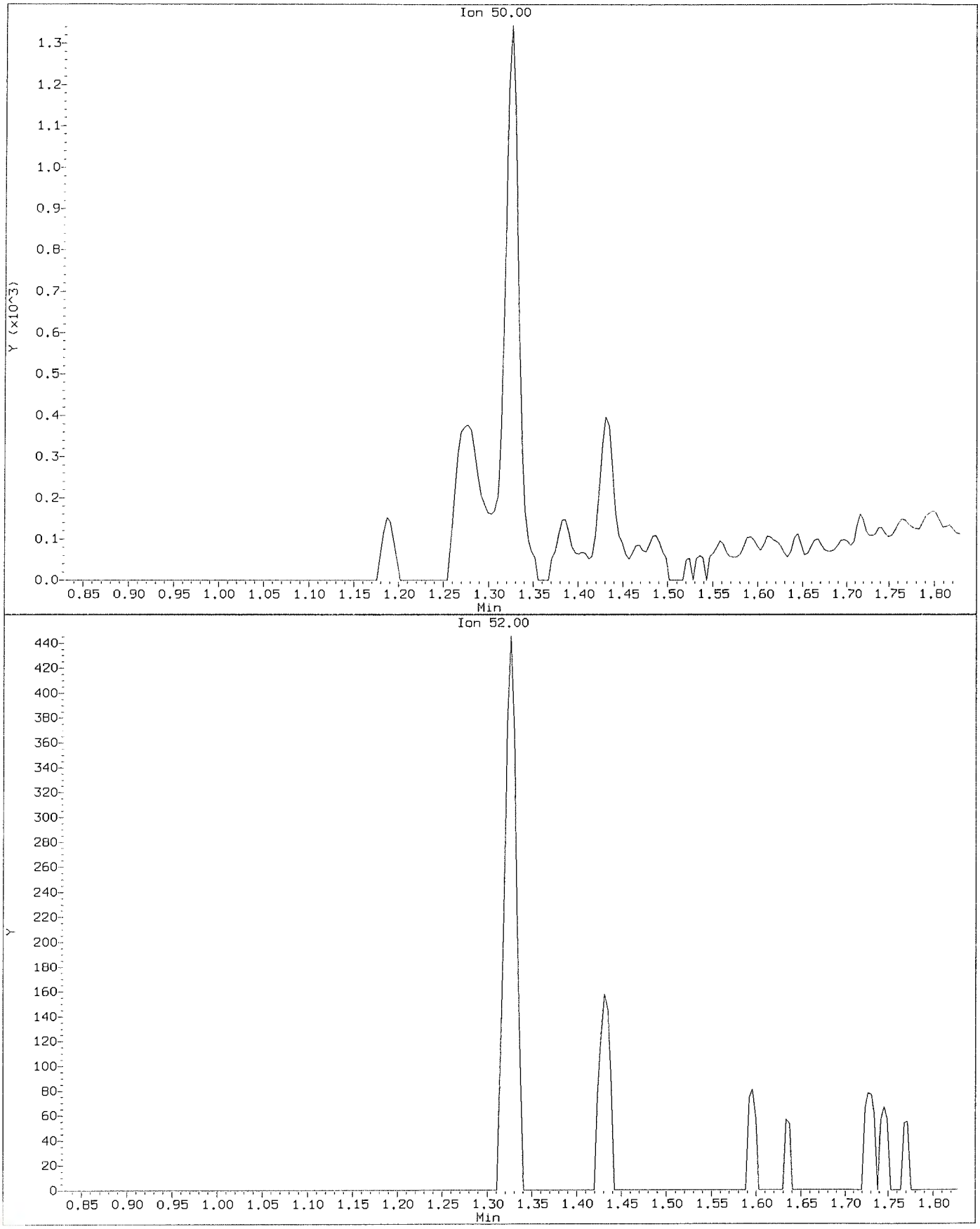
Compound: Chloroethane
CAS Number: 75-00-3





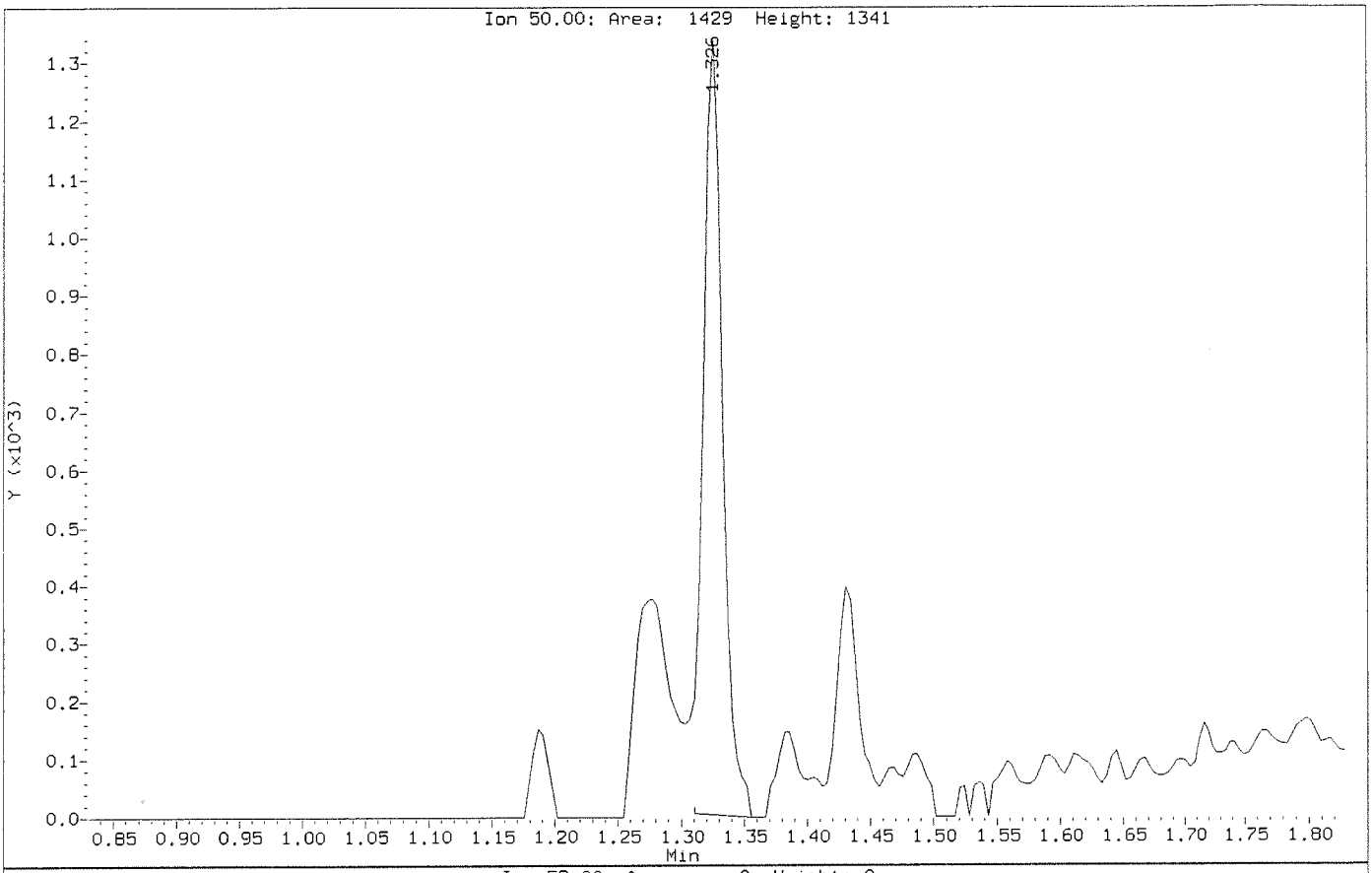
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Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

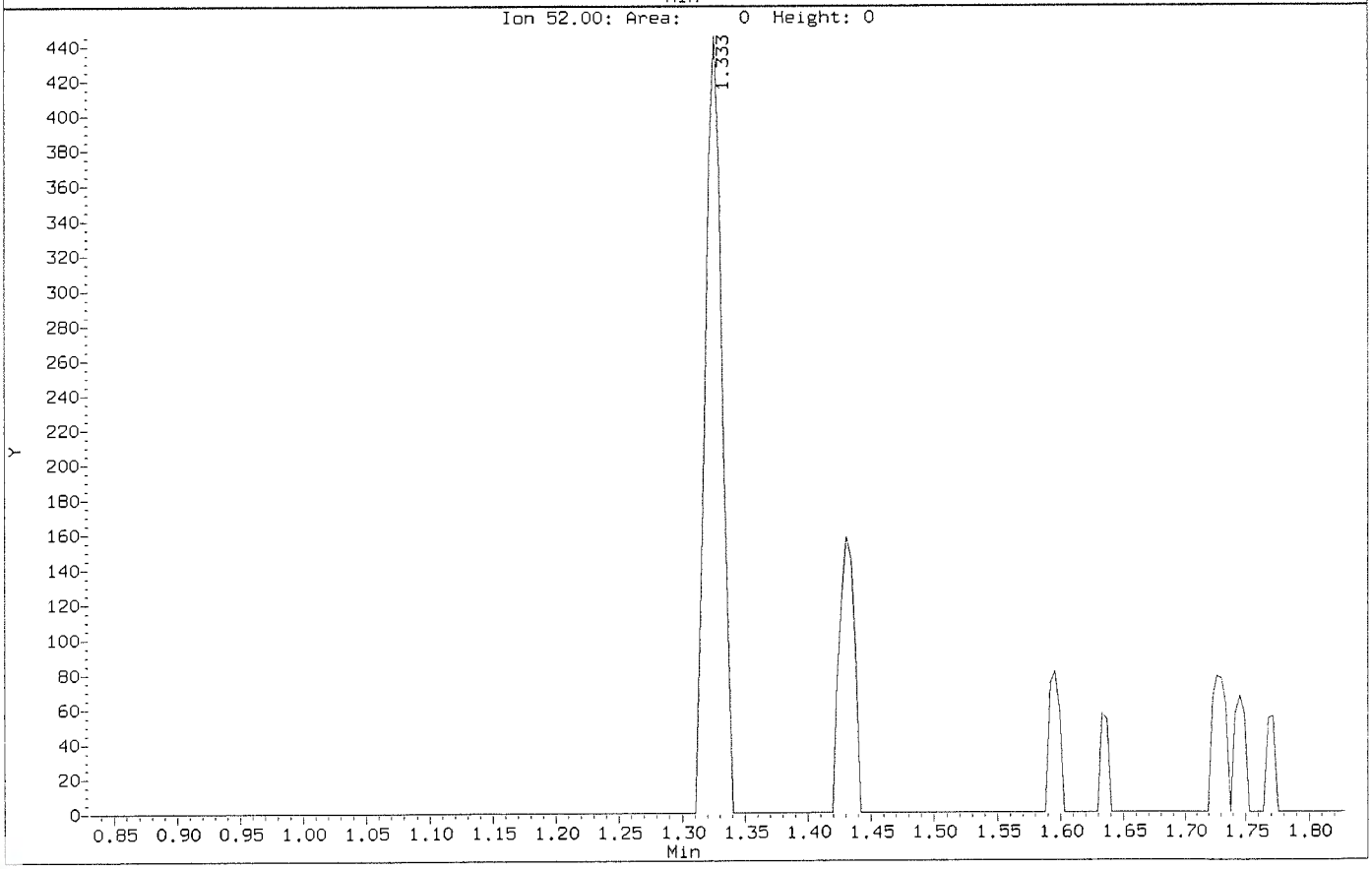
Compound: Chloromethane
CAS Number: 74-87-3



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Client Sample ID: VSTD000.5

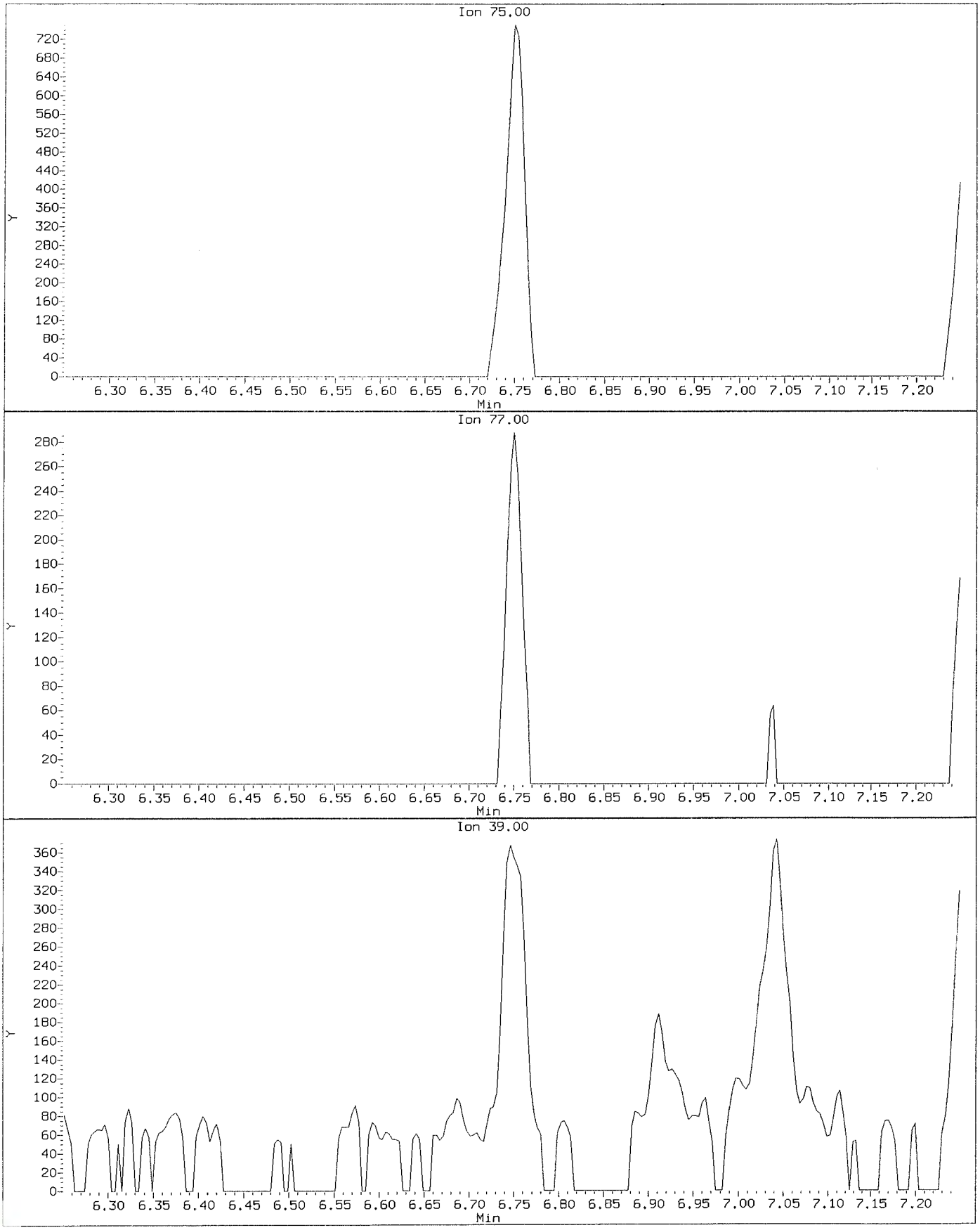
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CAS Number: 74-87-3





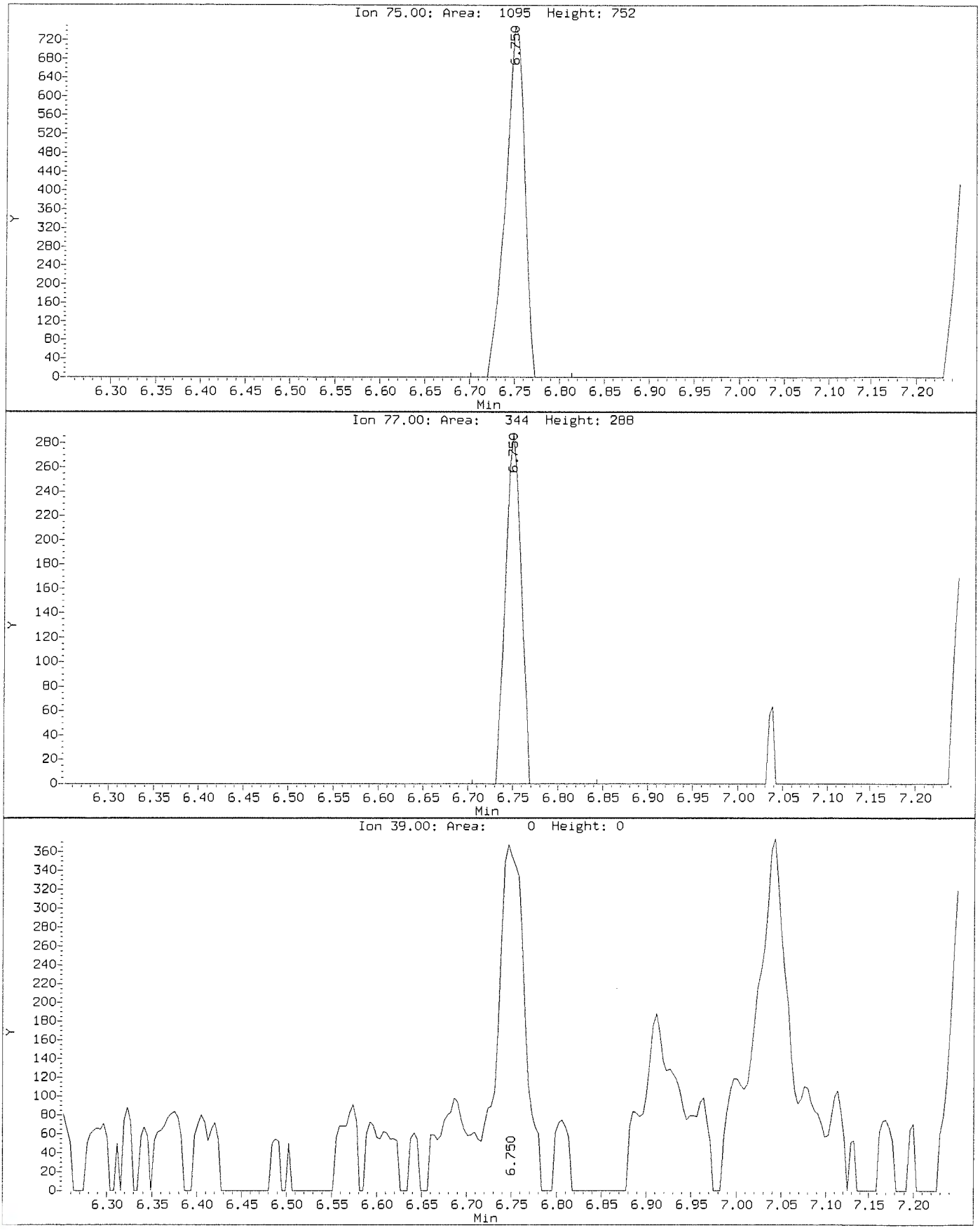
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Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: cis-1,3-Dichloropropene
CAS Number: 10061-01-5



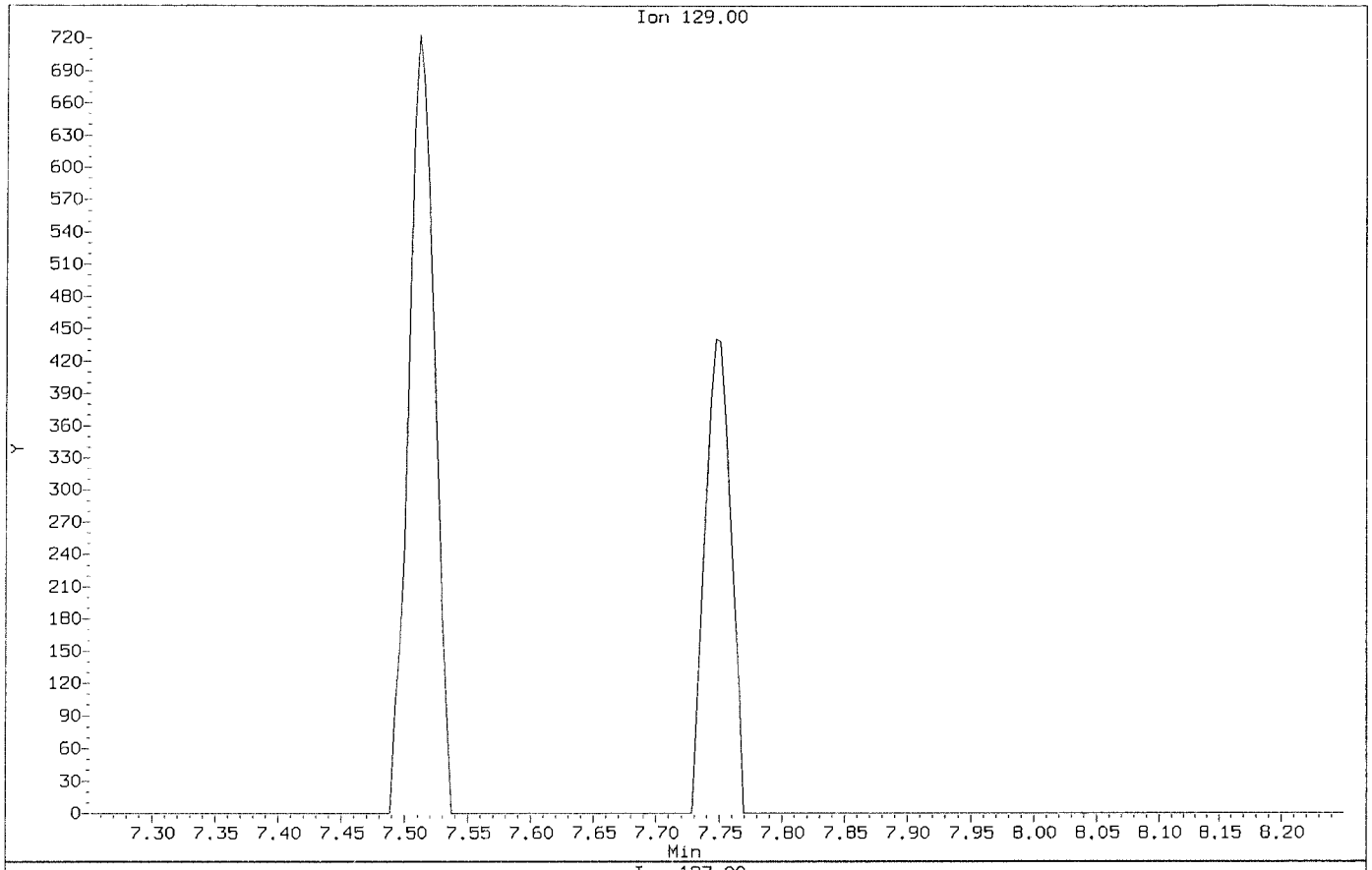
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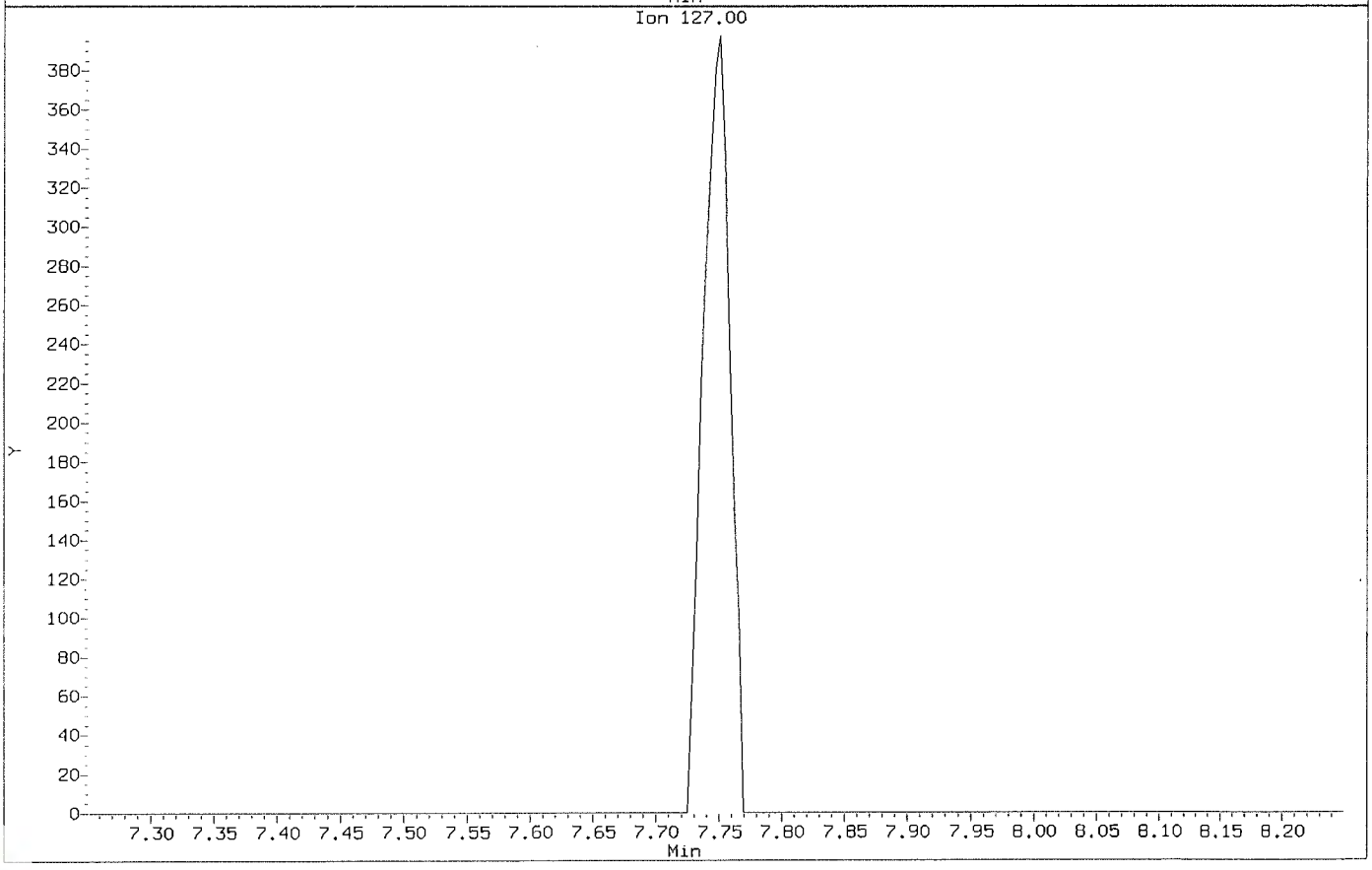
Compound: cis-1,3-Dichloropropene
CAS Number: 10061-01-5



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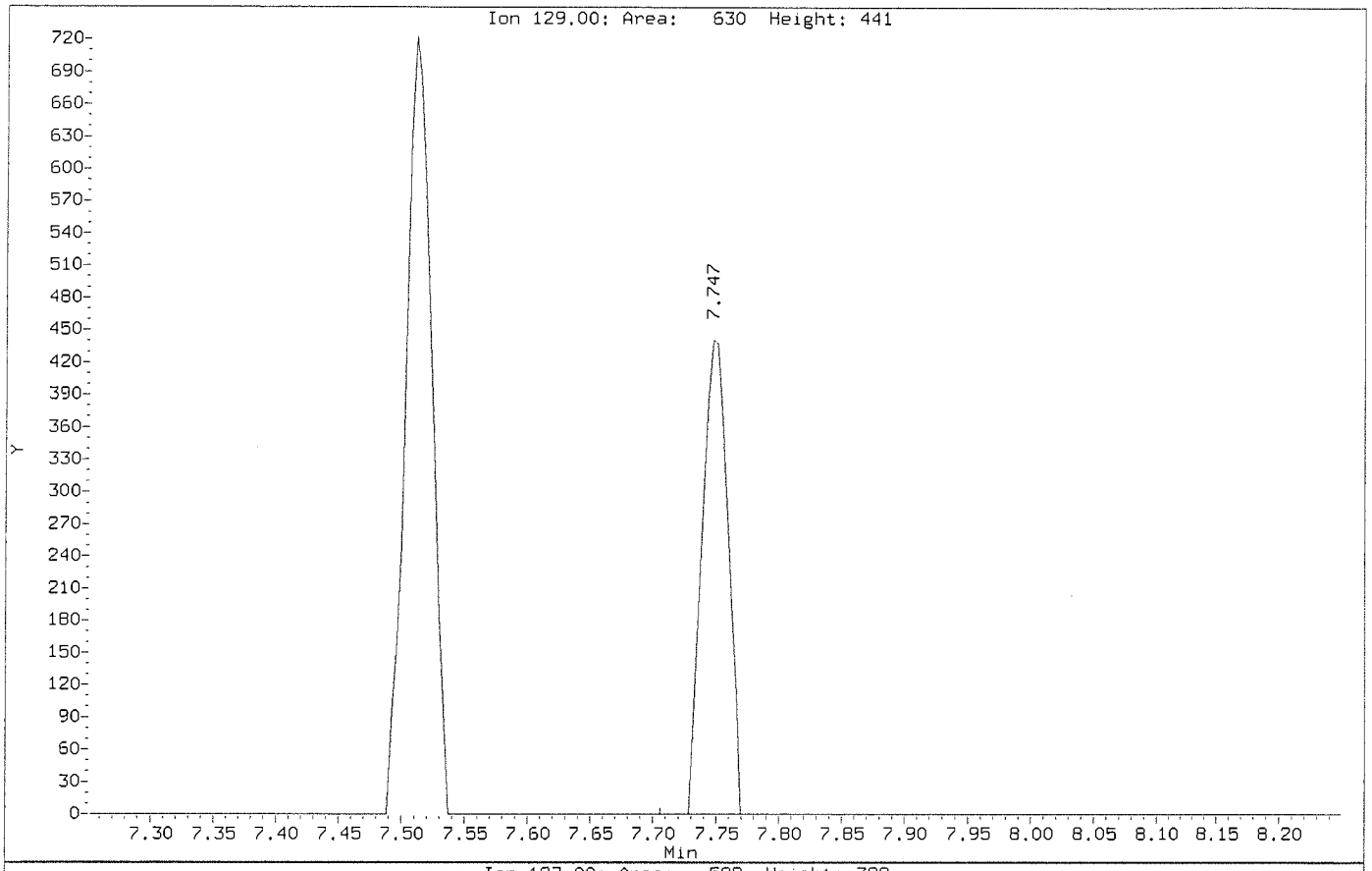
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CAS Number: 124-48-1

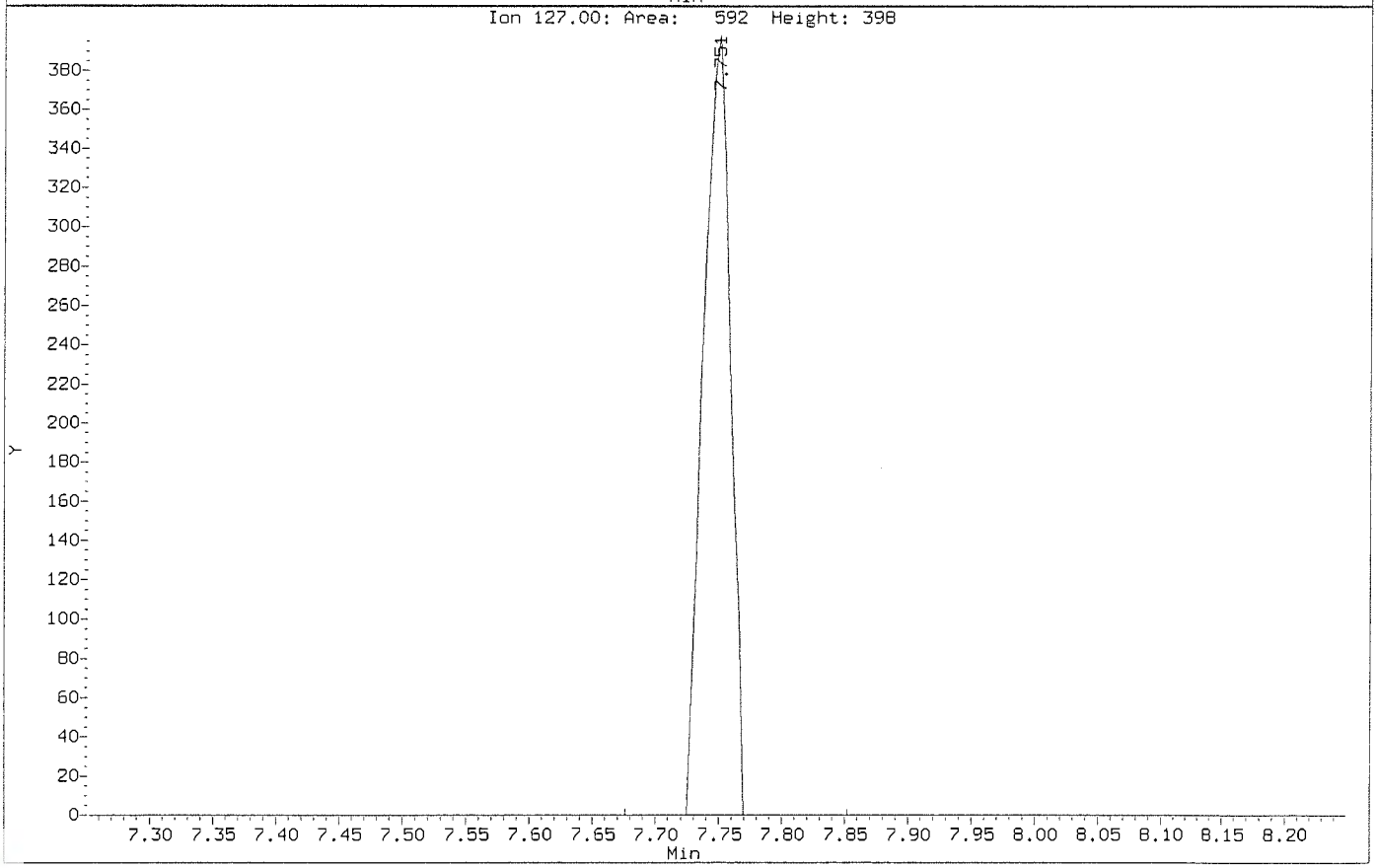




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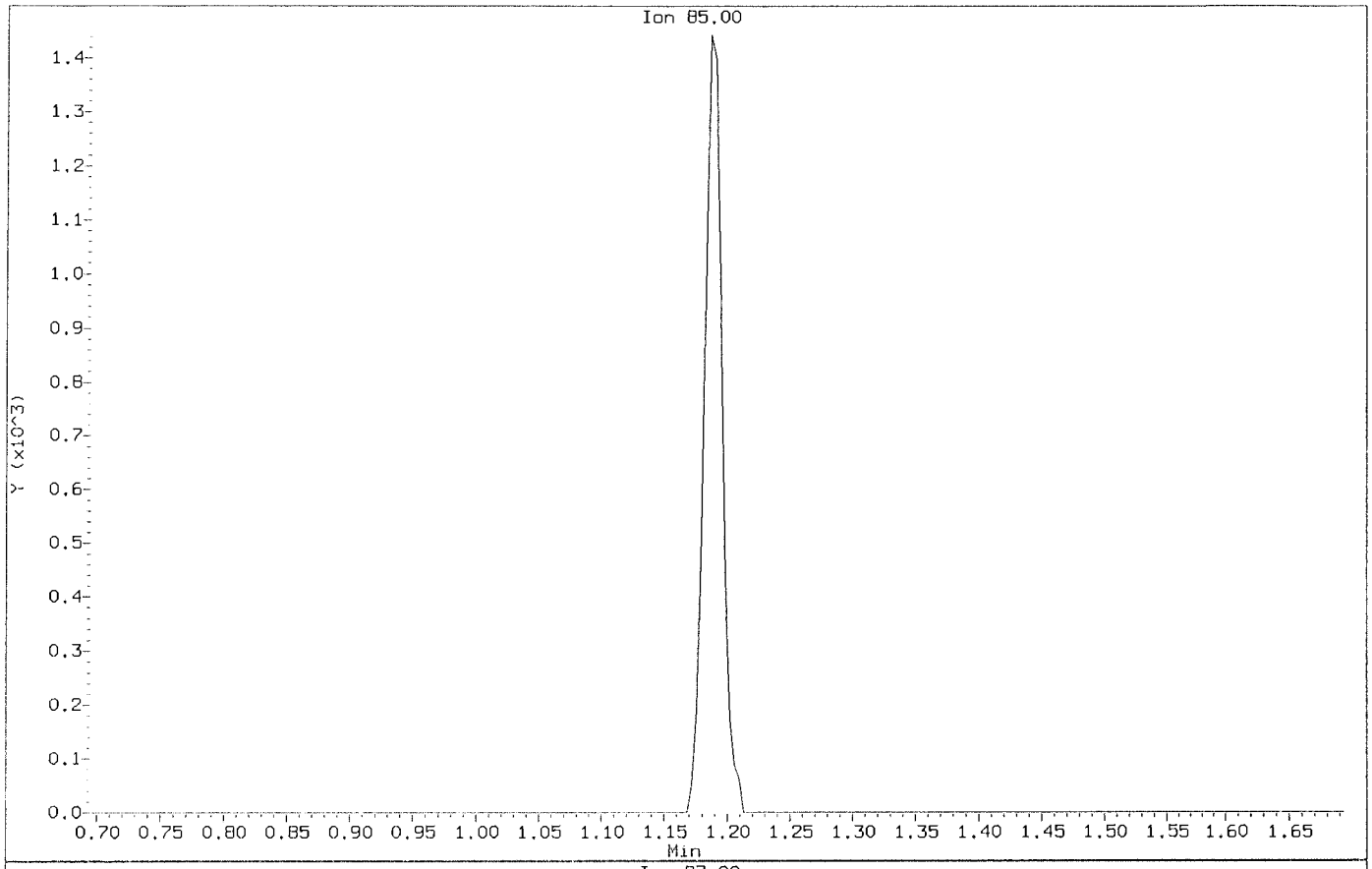
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CAS Number: 124-48-1

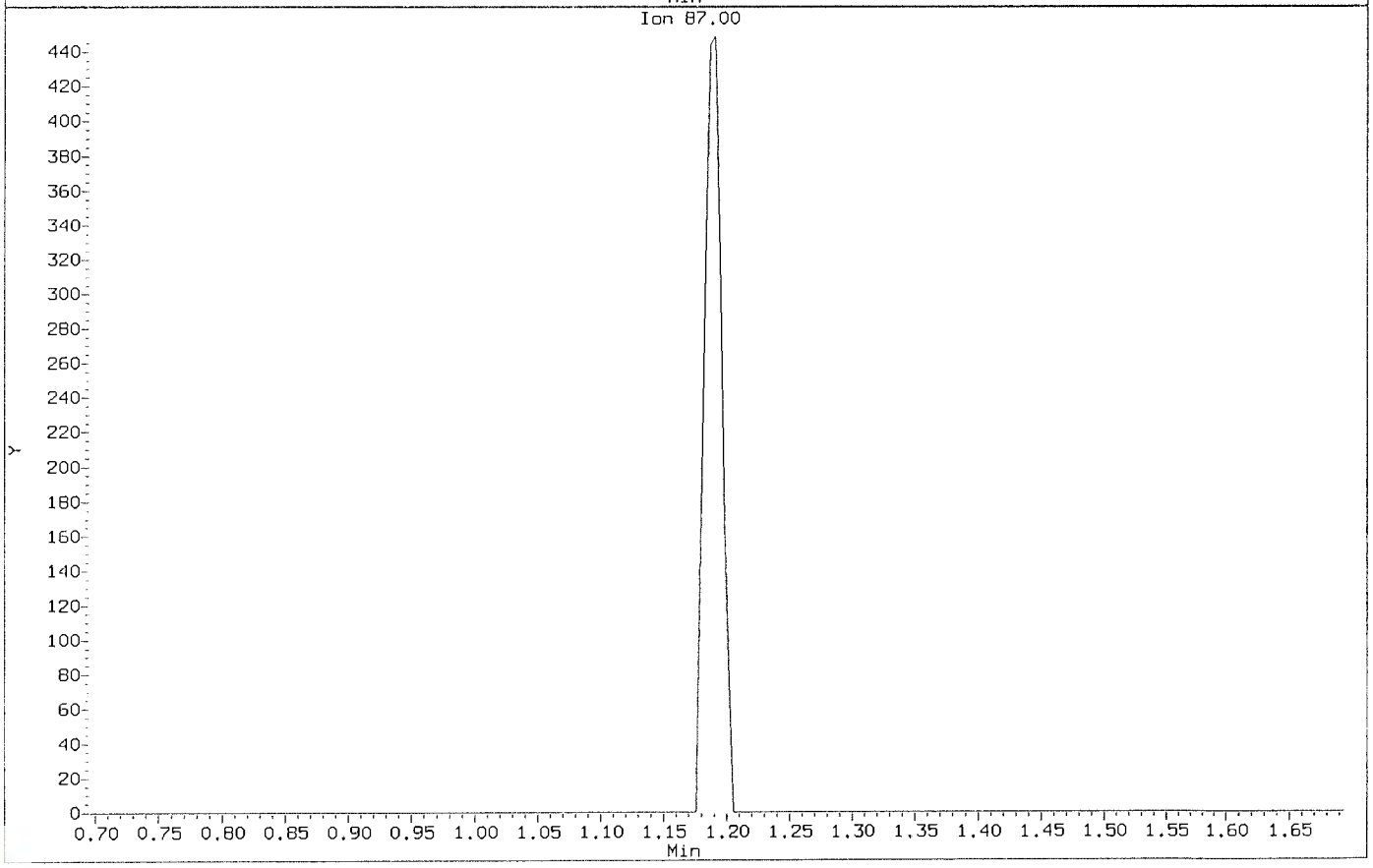




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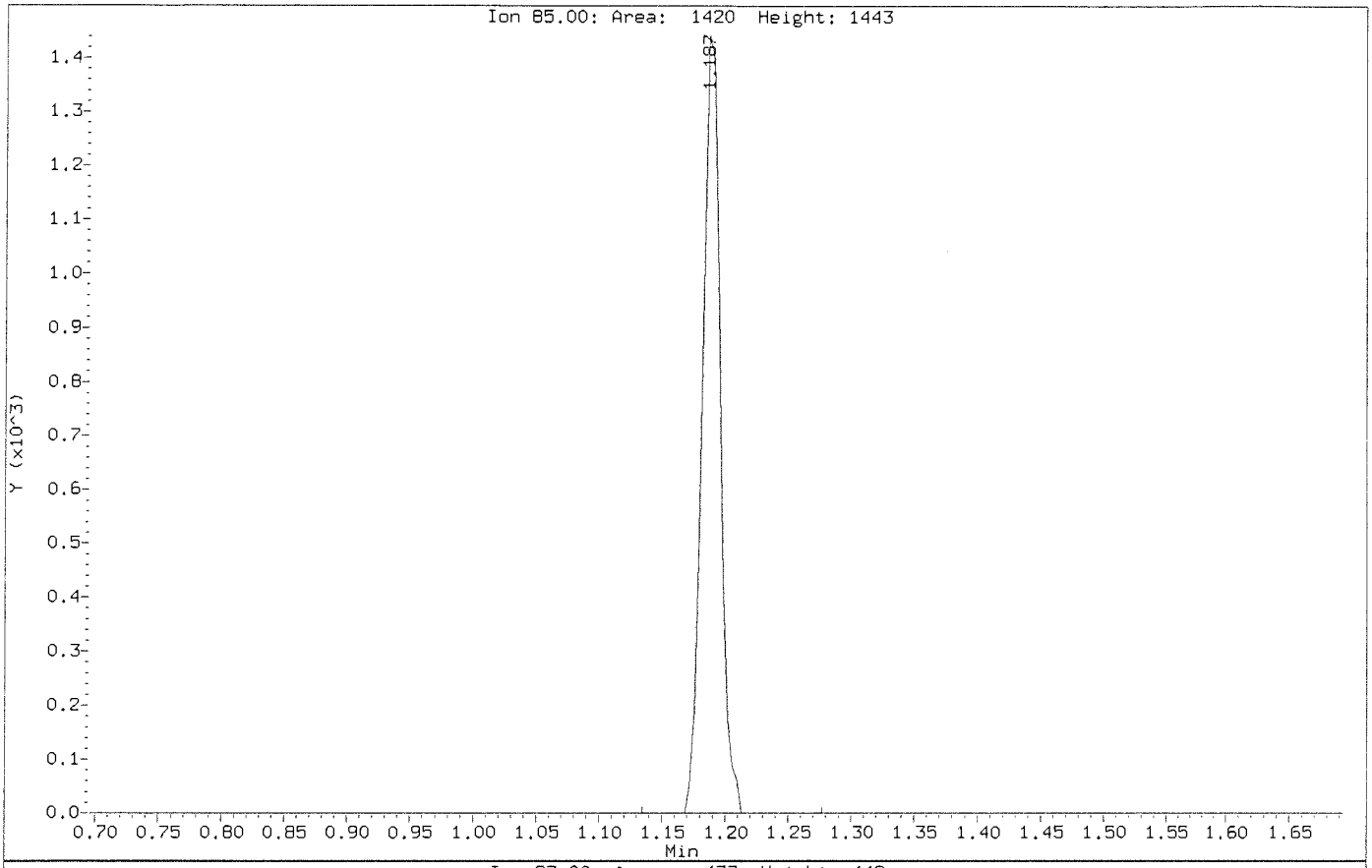
Compound: Dichlorodifluoromethane
CAS Number: 75-71-8

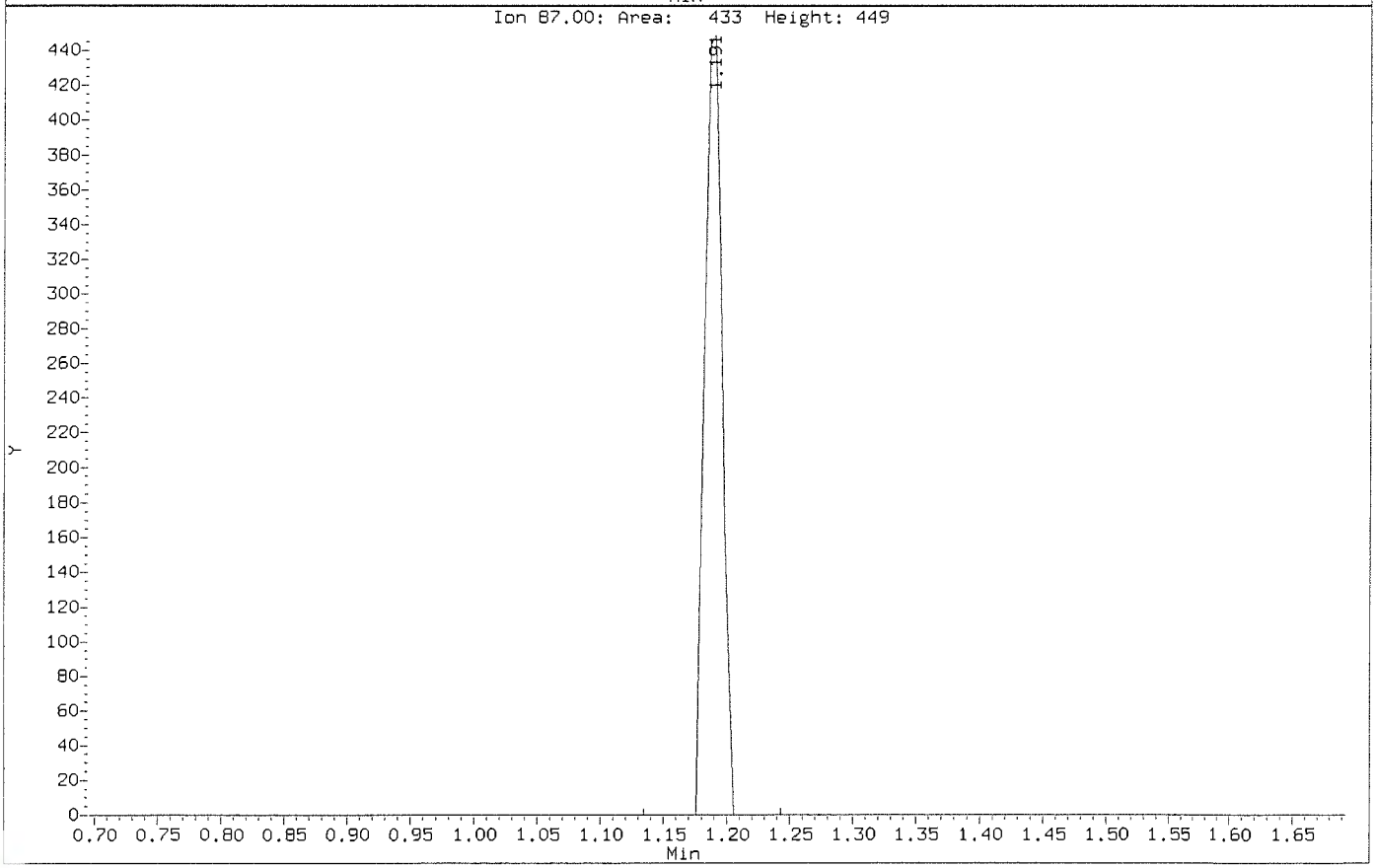




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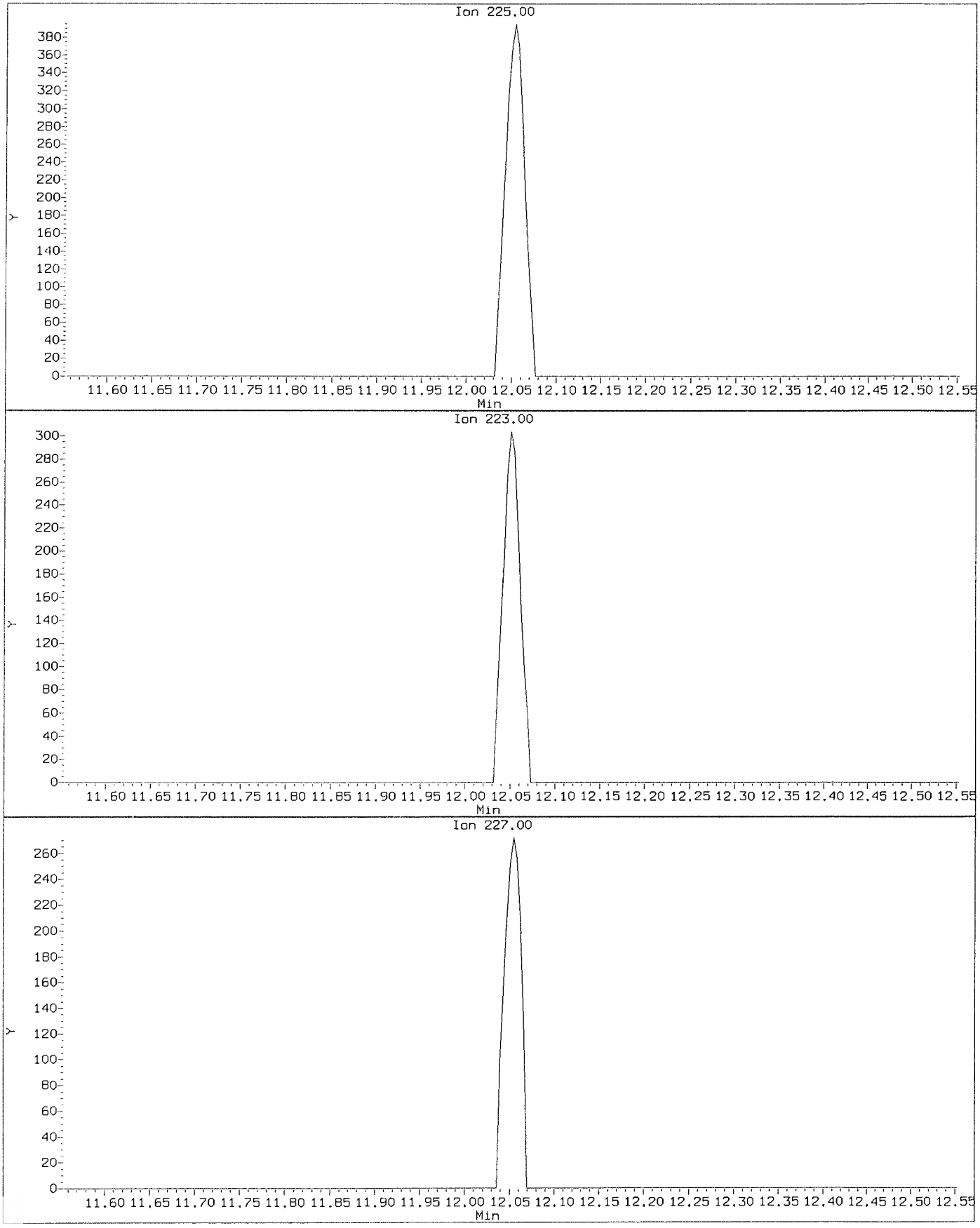
Compound: Dichlorodifluoromethane
CAS Number: 75-71-8





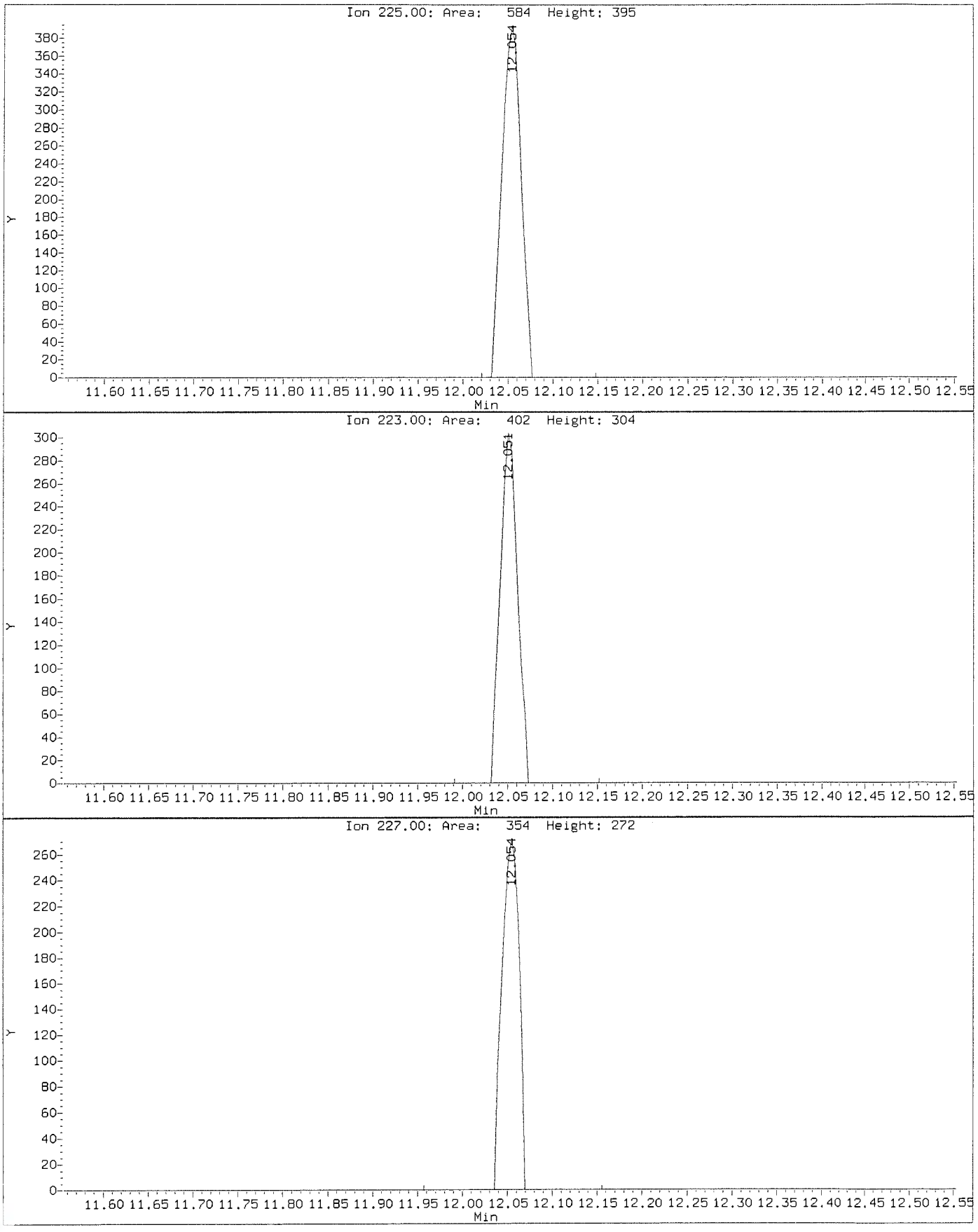
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Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Hexachlorobutadiene
CAS Number: 87-68-3



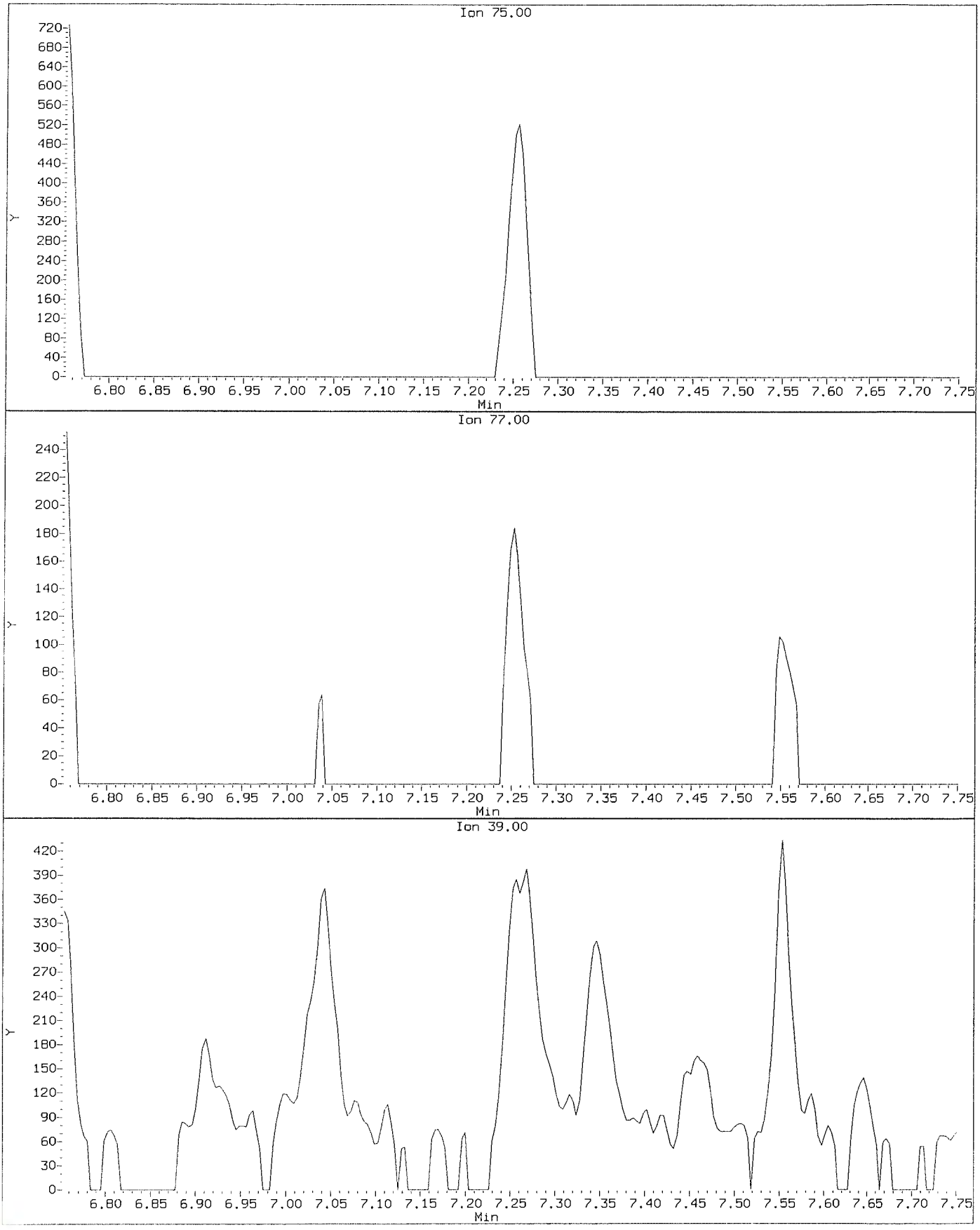
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Client Sample ID: VSTD000.5

Compound: Hexachlorobutadiene
CAS Number: 87-68-3



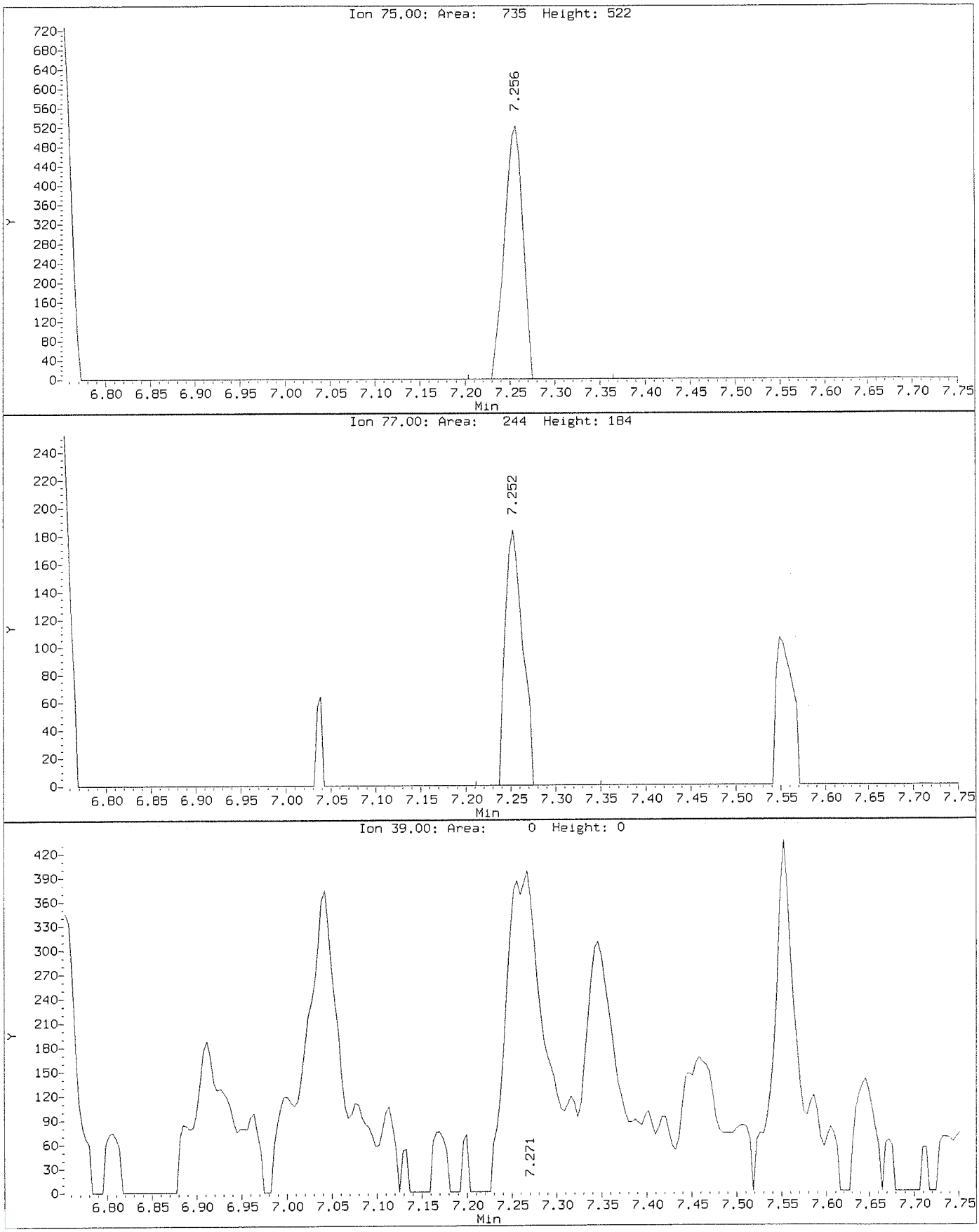
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Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: trans-1,3-Dichloropropene
CAS Number: 10061-02-6



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111503.D
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: trans-1,3-Dichloropropene
CAS Number: 10061-02-6



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111504.D Page 1
Report Date: 20-Dec-2021 15:39

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111504.D
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Inj Date : 15-NOV-2021 14:58
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD001;VSTD001;1;3;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211115.b\8260C.m
Meth Date : 20-Dec-2021 15:39 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 14:36 Cal File: U111503.D
Als bottle: 5 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

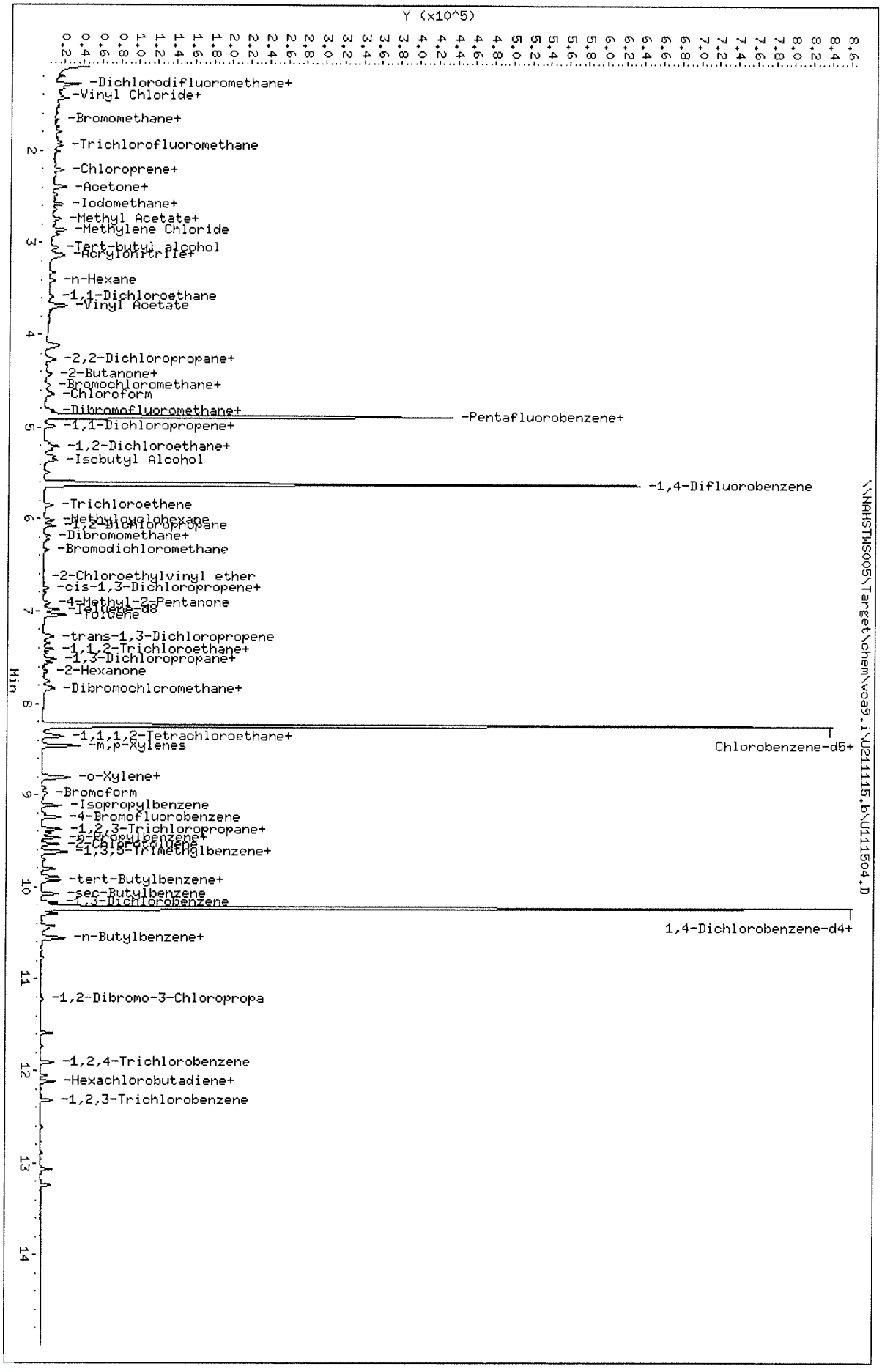
Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.883	4.883	(1.000)	271018	50.0000	
* 36 1,4-Difluorobenzene	114	5.618	5.618	(1.000)	470773	50.0000	
* 47 Chlorobenzene-d5	117	8.242	8.242	(1.000)	421143	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	208819	50.0000	
$ 30 Dibromofluoromethane	113	4.823	4.823	(0.988)	2474	1.00000	0.02(a)
$ 35 1,2-Dichloroethane-d4	65	5.168	5.168	(1.058)	3378	1.00000	(a)
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	9726	1.00000	0.88(a)
$ 69 4-Bromofluorobenzene	95	9.250	9.250	(1.122)	6215	1.00000	0.21(a)
60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	2215	1.00000	1.57(a)
31 1,1,1-Trichloroethane	97	4.815	4.815	(0.986)	3685	1.00000	0.94(a)
68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	4554	1.00000	1.03(aM)
53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	2641	1.00000	1.06(a)
22 1,1-Dichloroethane	63	3.590	3.590	(0.735)	5189	1.00000	1.07(a)
11 1,1-Dichloroethene	96	2.394	2.394	(0.490)	2581	1.00000	1.06(a)
32 1,1-Dichloropropene	75	4.992	4.992	(0.889)	4071	1.00000	1.05(a)
93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	3989	1.00000	1.06(a)
71 1,2,3-Trichloropropane	75	9.415	9.415	(0.921)	3759	1.00000	0.87(a)
90 1,2,4-Trichlorobenzene	180	11.912	11.912	(1.165)	3820	1.00000	0.99(a)
79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	10675	1.00000	1.01(a)
89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	360	1.00000	2.90(aM)
57 1,2-Dibromoethane	107	7.844	7.844	(0.952)	2956	1.00000	0.98(a)
88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	6329	1.00000	1.07(a)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.246	(0.934)	4817	1.00000	1.13(aM)
42	1,2-Dichloropropane	63	6.071	6.071	(1.081)	3104	1.00000	1.04(a)
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	10492	1.00000	1.02(a)
83	1,3-Dichlorobenzene	146	10.172	10.172	(0.995)	6567	1.00000	1.09(a)
54	1,3-Dichloropropane	76	7.556	7.556	(0.917)	5573	1.00000	1.05(a)
84	1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	6860	1.00000	1.10(a)
26	2,2-Dichloropropane	77	4.264	4.264	(0.873)	2682	1.00000	0.98(a)
24	2-Butanone	43	4.350	4.350	(0.891)	2847	2.00000	2.00(a)
76	2-Chlorotoluene	91	9.539	9.539	(0.933)	9519	1.00000	1.05(a)
52	2-Hexanone	43	7.649	7.649	(0.928)	3298	2.00000	1.64(TaH)
77	4-Chlorotoluene	91	9.632	9.632	(0.942)	10627	1.00000	1.01(a)
82	p-Isopropyltoluene	119	10.202	10.202	(0.998)	9764	1.00000	0.95(a)
45	4-Methyl-2-Pentanone	43	6.915	6.915	(0.839)	6121	2.00000	2.01(a)
10	Acetone	43	2.476	2.476	(0.507)	4060	2.00000	(a)
37	Benzene	78	5.205	5.205	(0.927)	13246	1.00000	1.11(a)
74	Bromobenzene	156	9.374	9.374	(0.917)	3452	1.00000	1.06(a)
29	Bromochloromethane	128	4.545	4.545	(0.931)	1559	1.00000	1.01(a)
39	Bromodichloromethane	83	6.337	6.337	(1.128)	3055	1.00000	1.81(aM)
66	Bromoform	173	8.976	8.976	(1.089)	1090	1.00000	1.97(aM)
6	Bromomethane	94	1.663	1.663	(0.341)	2151	1.00000	0.78(a)
19	Carbon Disulfide	76	2.577	2.577	(0.528)	14181	2.00000	2.11(a)
34	Carbon Tetrachloride	117	4.980	4.980	(0.887)	3053	1.00000	2.29(a)
59	Chlorobenzene	112	8.264	8.264	(1.003)	8952	1.00000	1.09(a)
7	Chloroethane	64	1.745	1.745	(0.357)	2379	1.00000	1.06(aM)
28	Chloroform	83	4.647	4.647	(0.952)	5488	1.00000	1.05(a)
3	Chloromethane	50	1.337	1.337	(0.274)	3019	1.00000	0.54(a)
27	cis-1,2-Dichloroethene	96	4.276	4.276	(0.876)	3470	1.00000	1.04(a)
46	cis-1,3-Dichloropropene	75	6.753	6.753	(1.202)	2819	1.00000	2.29(a)
55	Dibromochloromethane	129	7.751	7.751	(0.940)	2071	1.00000	2.13(a)
44	Dibromomethane	93	6.180	6.180	(1.100)	2075	1.00000	1.02(a)
2	Dichlorodifluoromethane	85	1.198	1.198	(0.245)	3384	1.00000	0.34(a)
61	Ethylbenzene	106	8.362	8.362	(1.015)	4316	1.00000	1.05(a)
91	Hexachlorobutadiene	225	12.050	12.050	(1.179)	1346	1.00000	0.94(a)
67	Isopropylbenzene	105	9.115	9.115	(1.106)	12845	1.00000	1.03(a)
62	m,p-Xylenes	106	8.463	8.463	(1.027)	10438	2.00000	2.05(a)
17	Methylene Chloride	84	2.859	2.859	(0.585)	3687	1.00000	1.15(a)
87	n-Butylbenzene	91	10.547	10.547	(1.032)	8937	1.00000	0.97(a)
73	n-Propylbenzene	91	9.467	9.467	(0.926)	14969	1.00000	1.05(a)
92	Naphthalene	128	12.122	12.122	(1.186)	11275	1.00000	0.97(a)
63	o-Xylene	106	8.804	8.804	(1.068)	5404	1.00000	1.07(a)
81	sec-Butylbenzene	105	10.078	10.078	(0.986)	11762	1.00000	1.00(a)
64	Styrene	104	8.819	8.819	(1.070)	8325	1.00000	0.96(a)
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	8791	1.00000	1.01(a)
56	Tetrachloroethene	164	7.514	7.514	(0.912)	2638	1.00000	1.11(a)
50	Toluene	91	7.038	7.038	(0.854)	13702	1.00000	1.08(a)
20	trans-1,2-Dichloroethene	96	3.125	3.125	(0.640)	2912	1.00000	1.06(a)
51	trans-1,3-Dichloropropene	75	7.252	7.252	(1.291)	2070	1.00000	2.57(a)
38	Trichloroethene	130	5.854	5.854	(1.042)	3189	1.00000	1.03(a)
8	Trichlorofluoromethane	101	1.948	1.948	(0.399)	4839	1.00000	1.10(a)
5	Vinyl Chloride	62	1.412	1.412	(0.289)	3447	1.00000	1.05(a)

QC Flag Legend

T - Target compound detected outside RT window.
a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

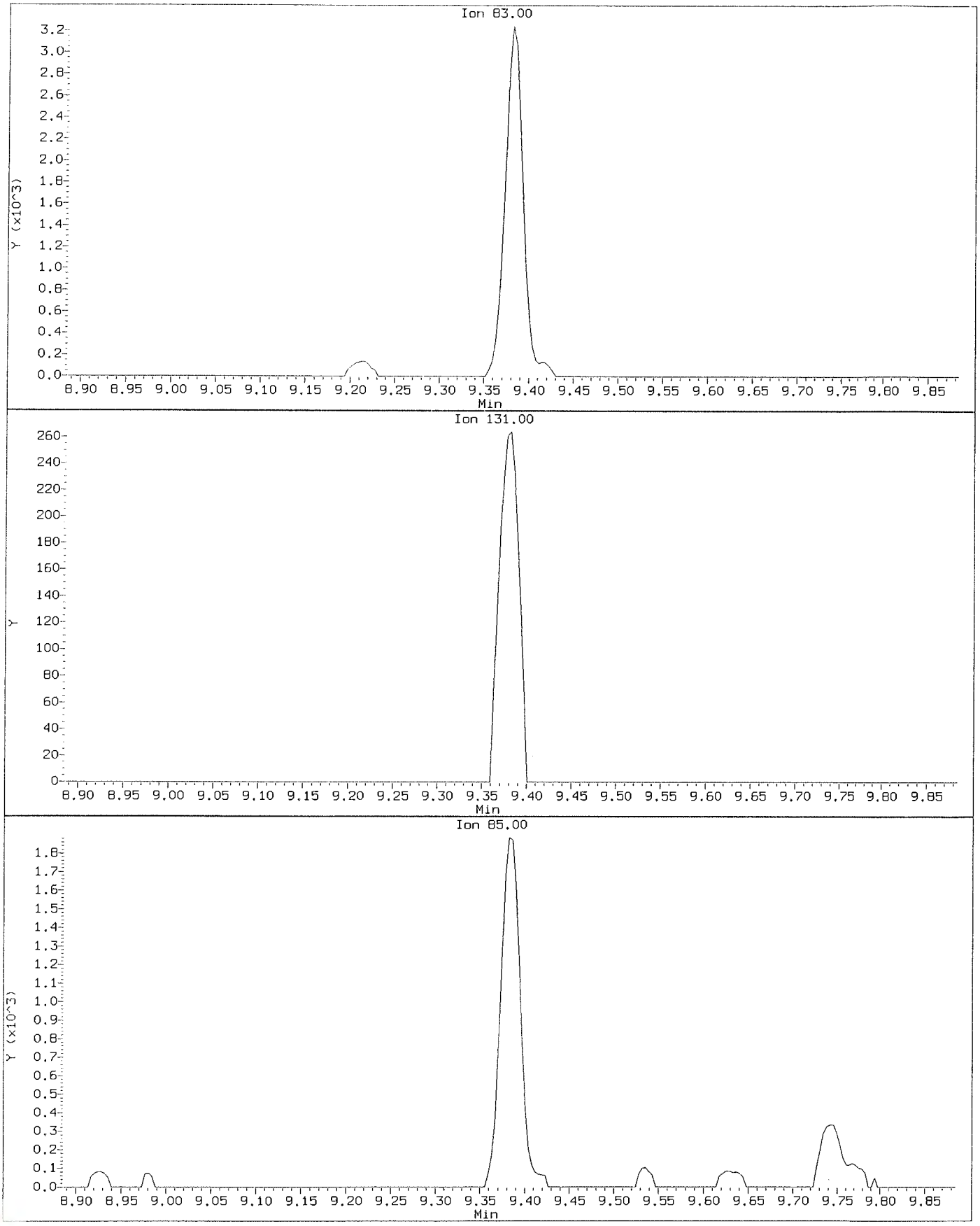


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Client ID: VSTD001
Sample Info: VSTD001,VSTD001,1,3,,
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

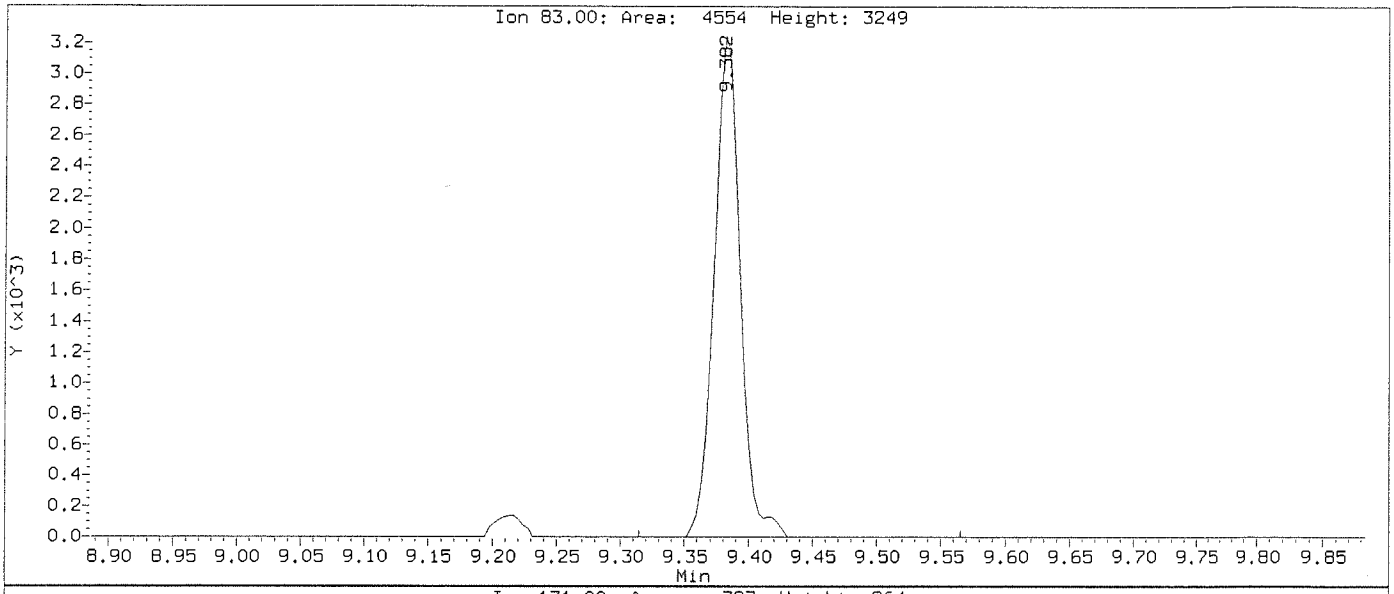
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Injection Date: 15-NOV-2021 14:58
Instrument: VOA9.i
Client Sample ID: VSTD001

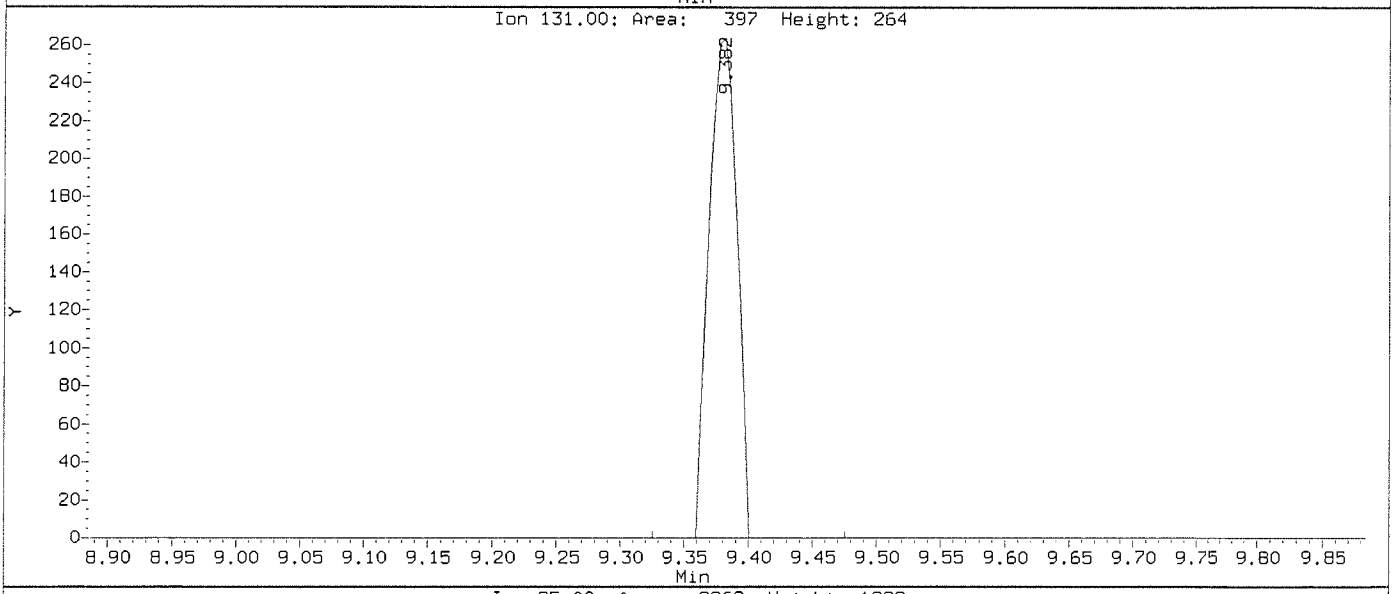
Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5

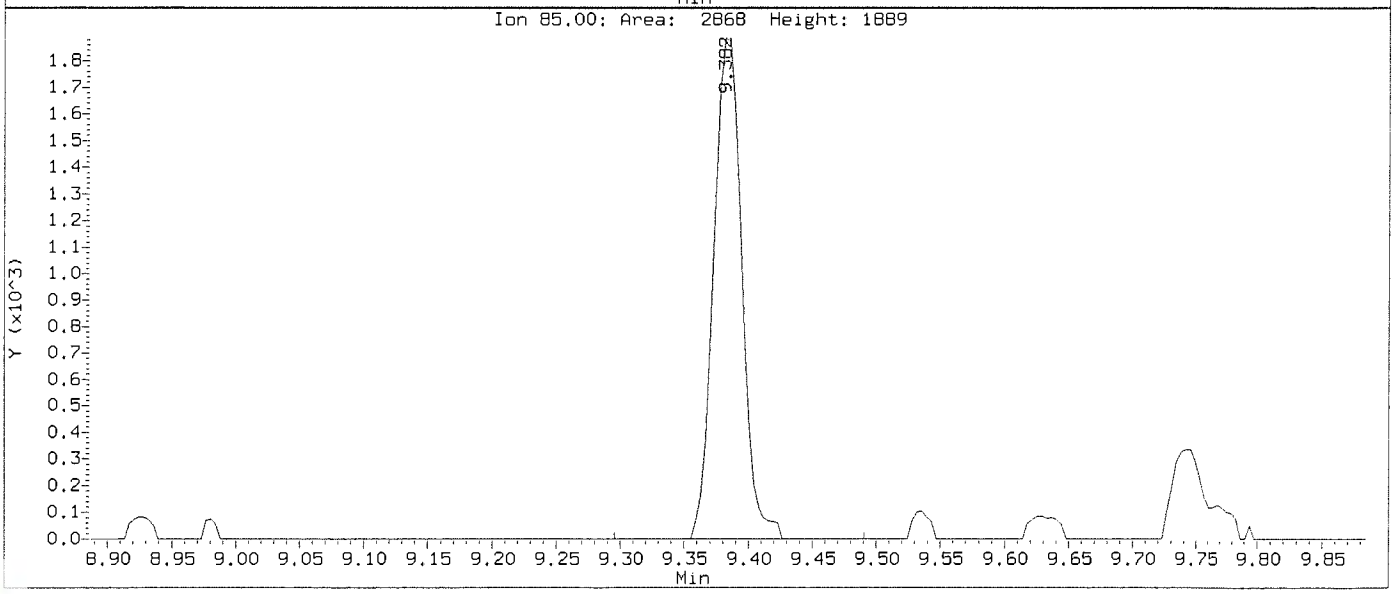


Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111504.D
Injection Date: 15-NOV-2021 14:58
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5

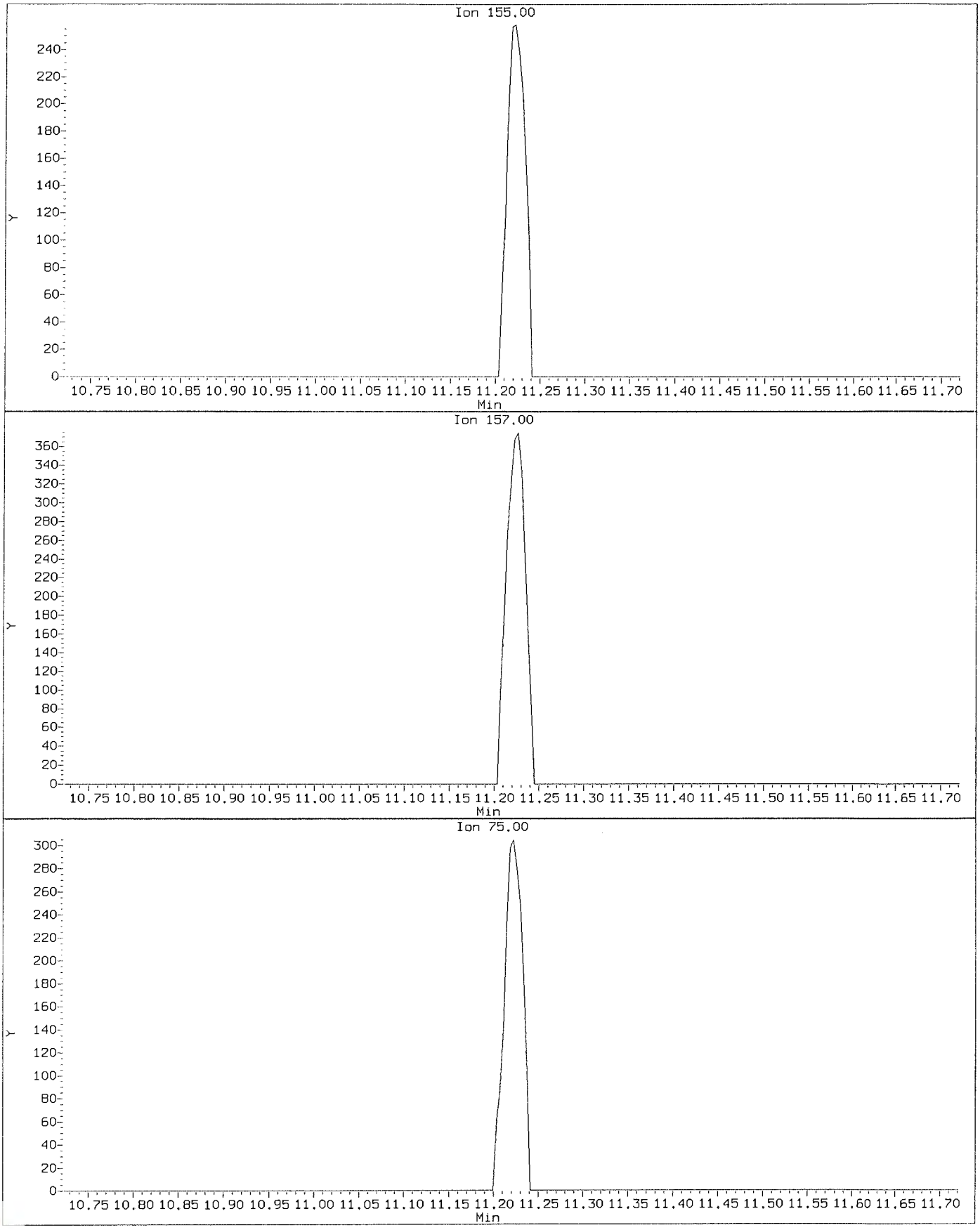






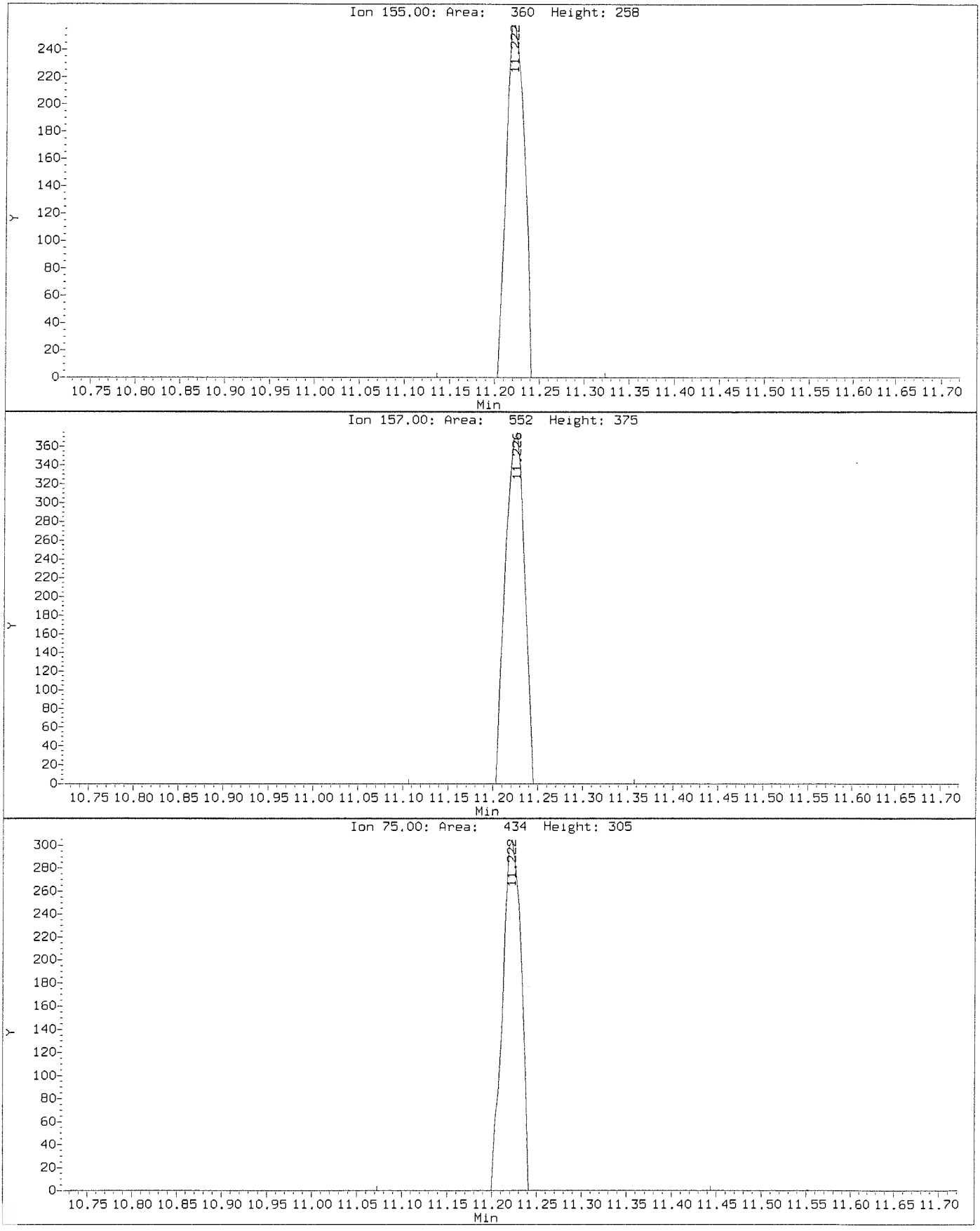
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Injection Date: 15-NOV-2021 14:58
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8



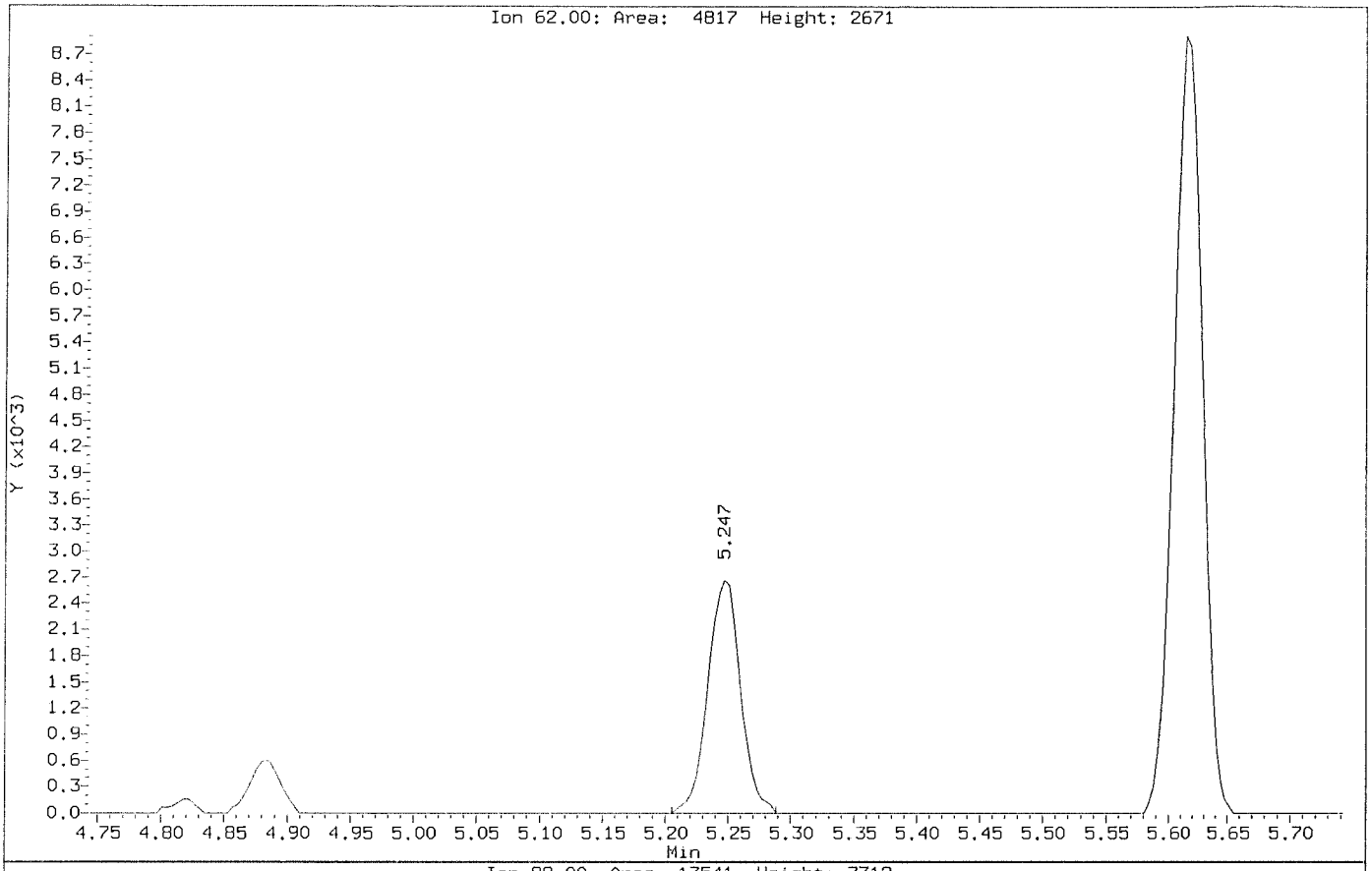
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Instrument: VOA9.i
Client Sample ID: VSTD001

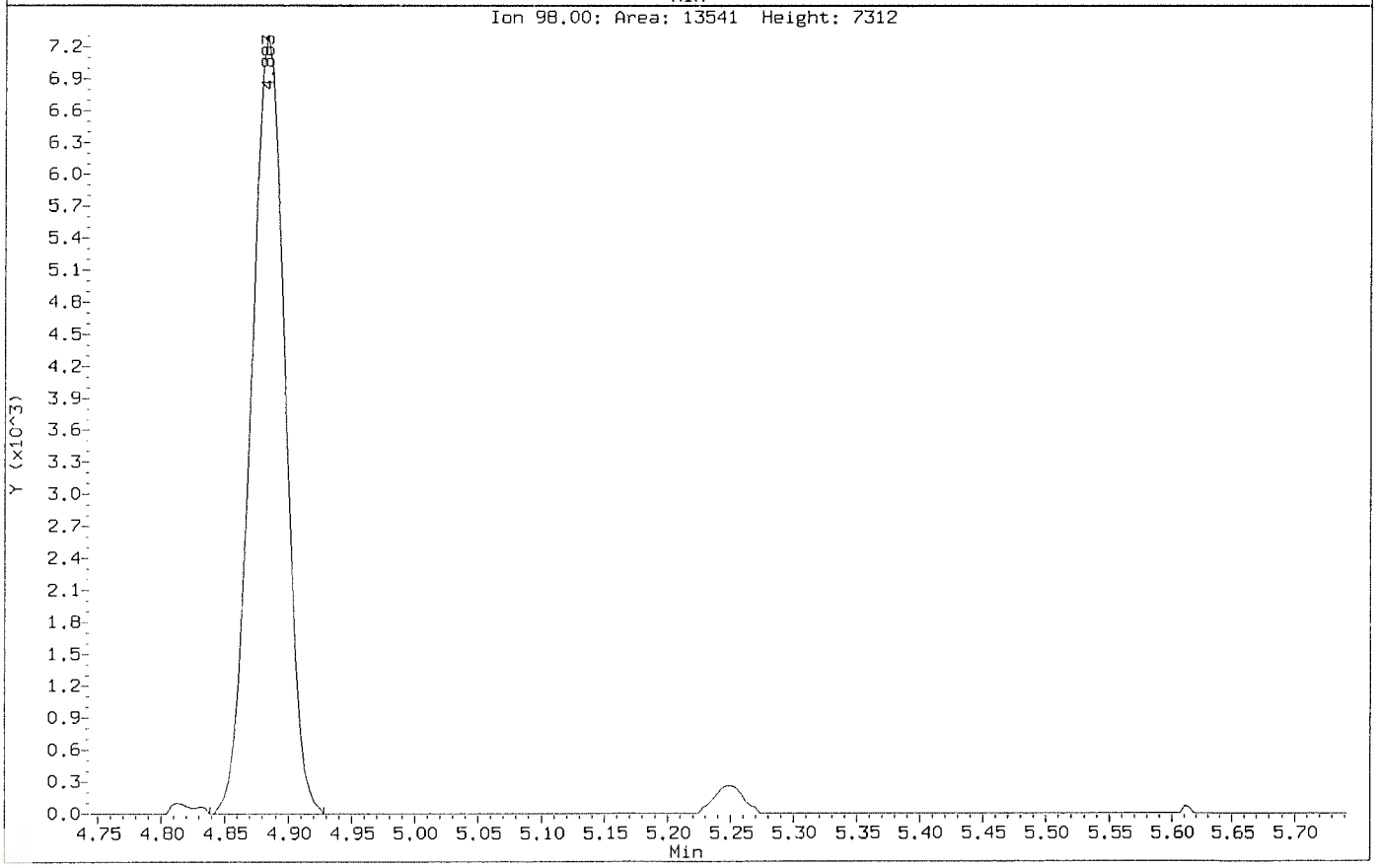
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CAS Number: 96-12-8



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Client Sample ID: VSTD001

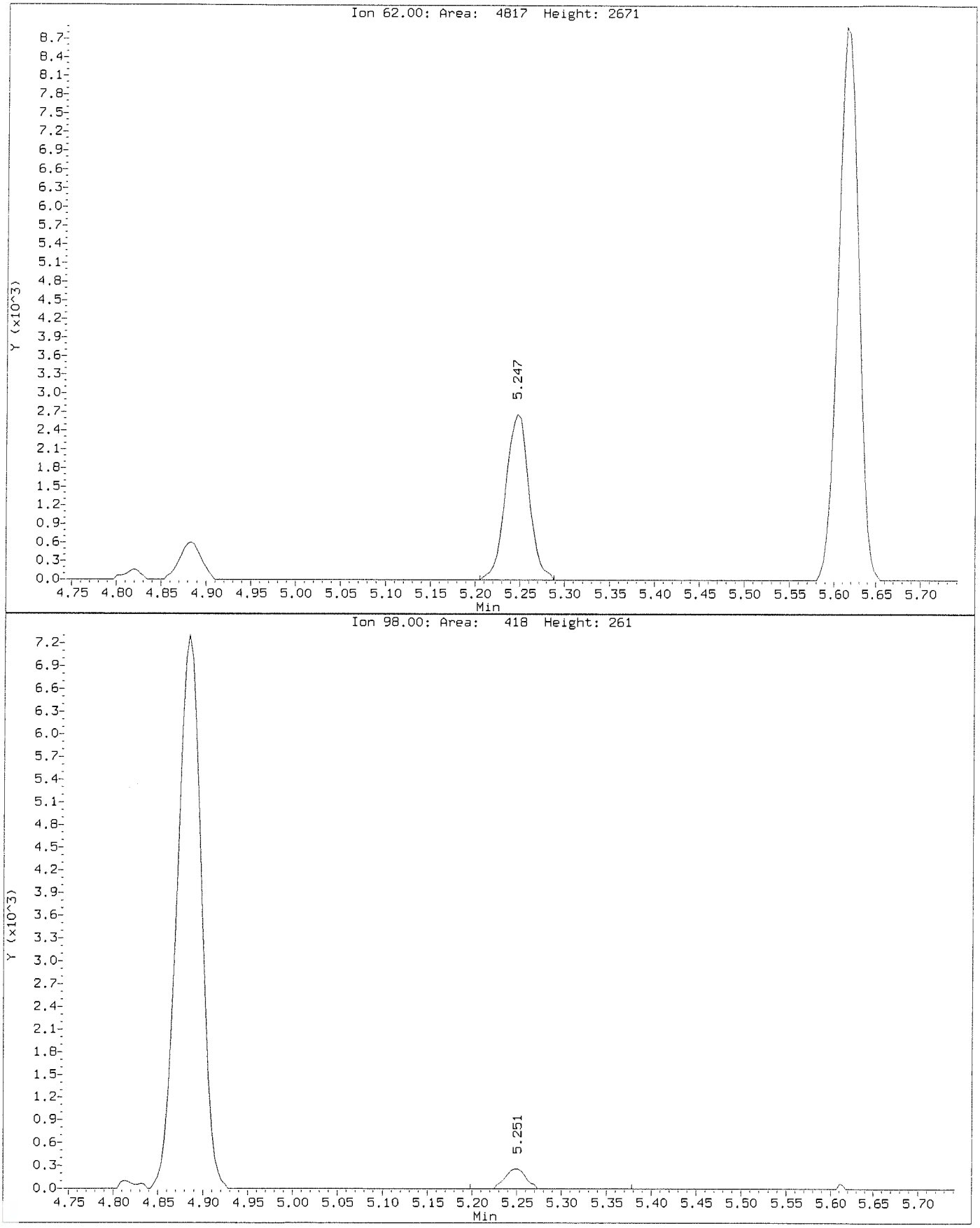
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CAS Number: 107-06-2





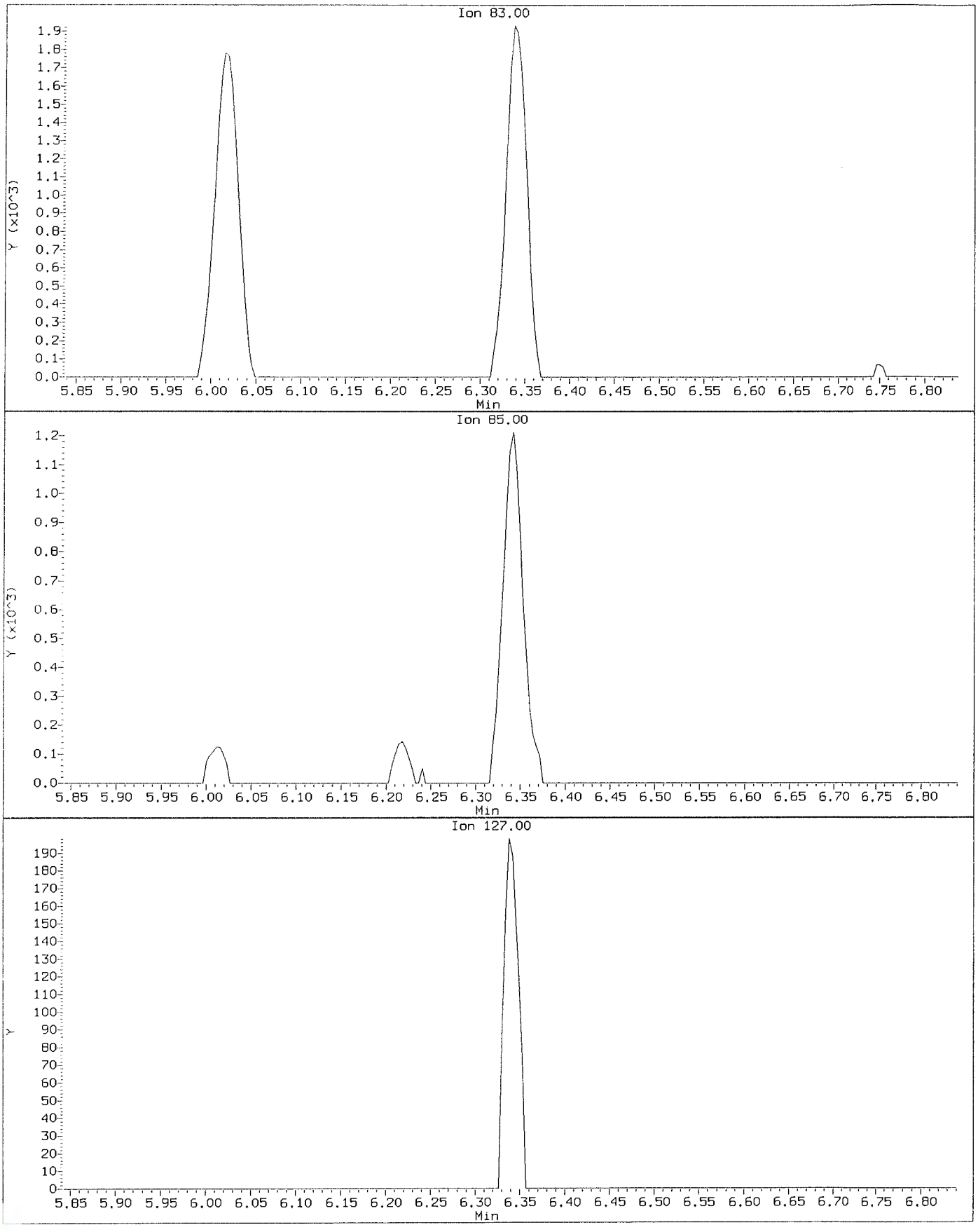
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Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: 1,2-Dichloroethane
CAS Number: 107-06-2



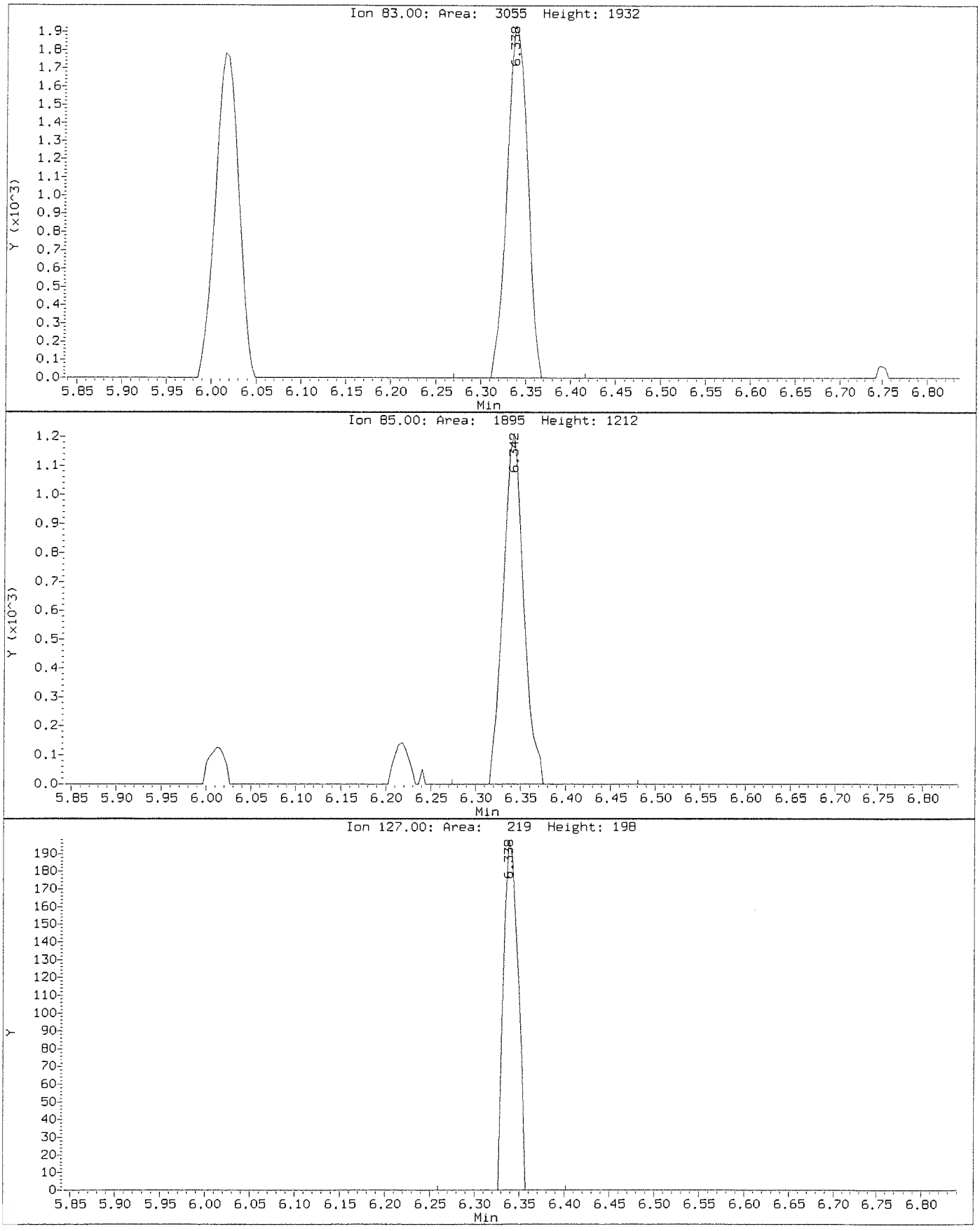
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Injection Date: 15-NOV-2021 14:58
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Bromodichloromethane
CAS Number: 75-27-4



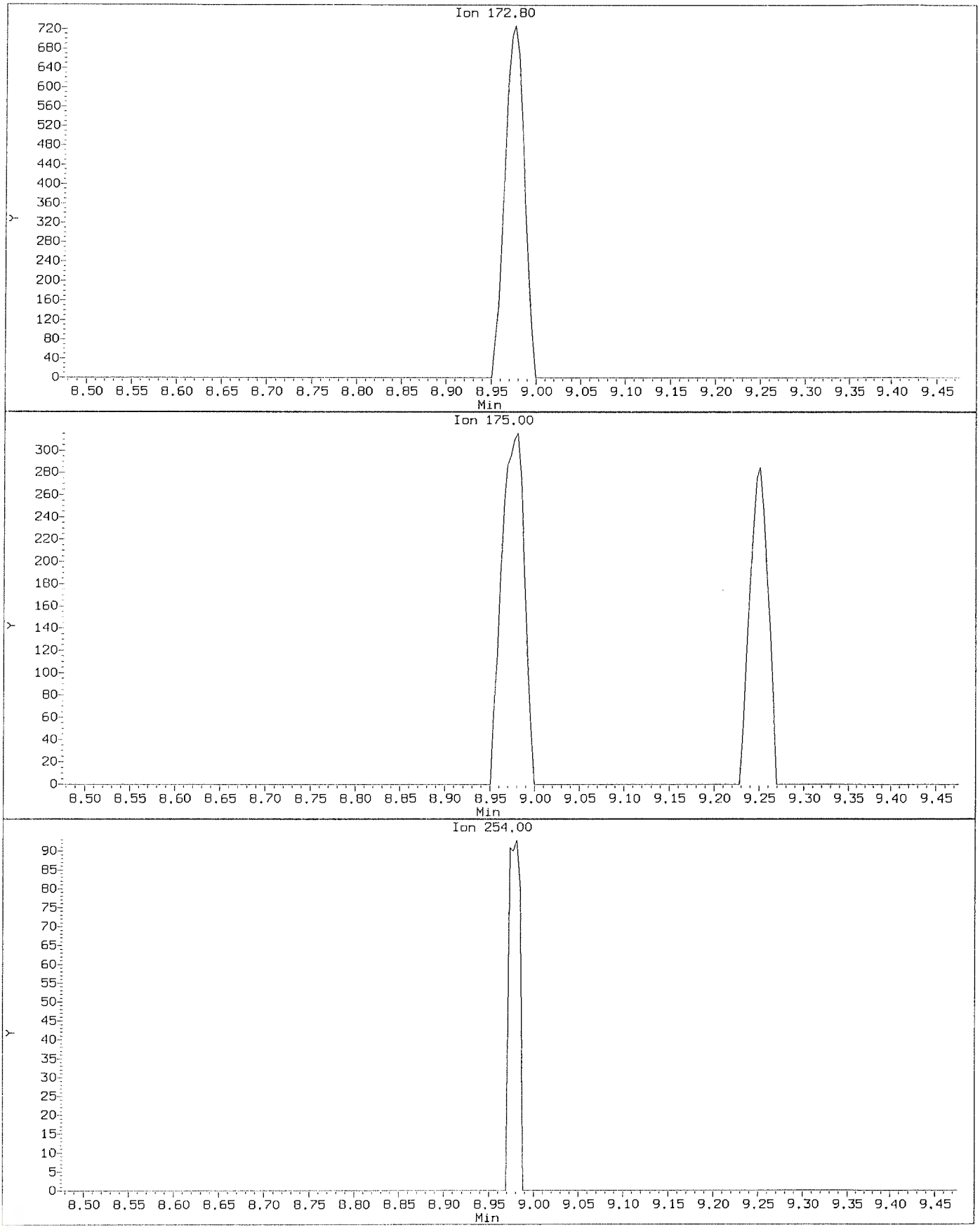
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Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Bromodichloromethane
CAS Number: 75-27-4



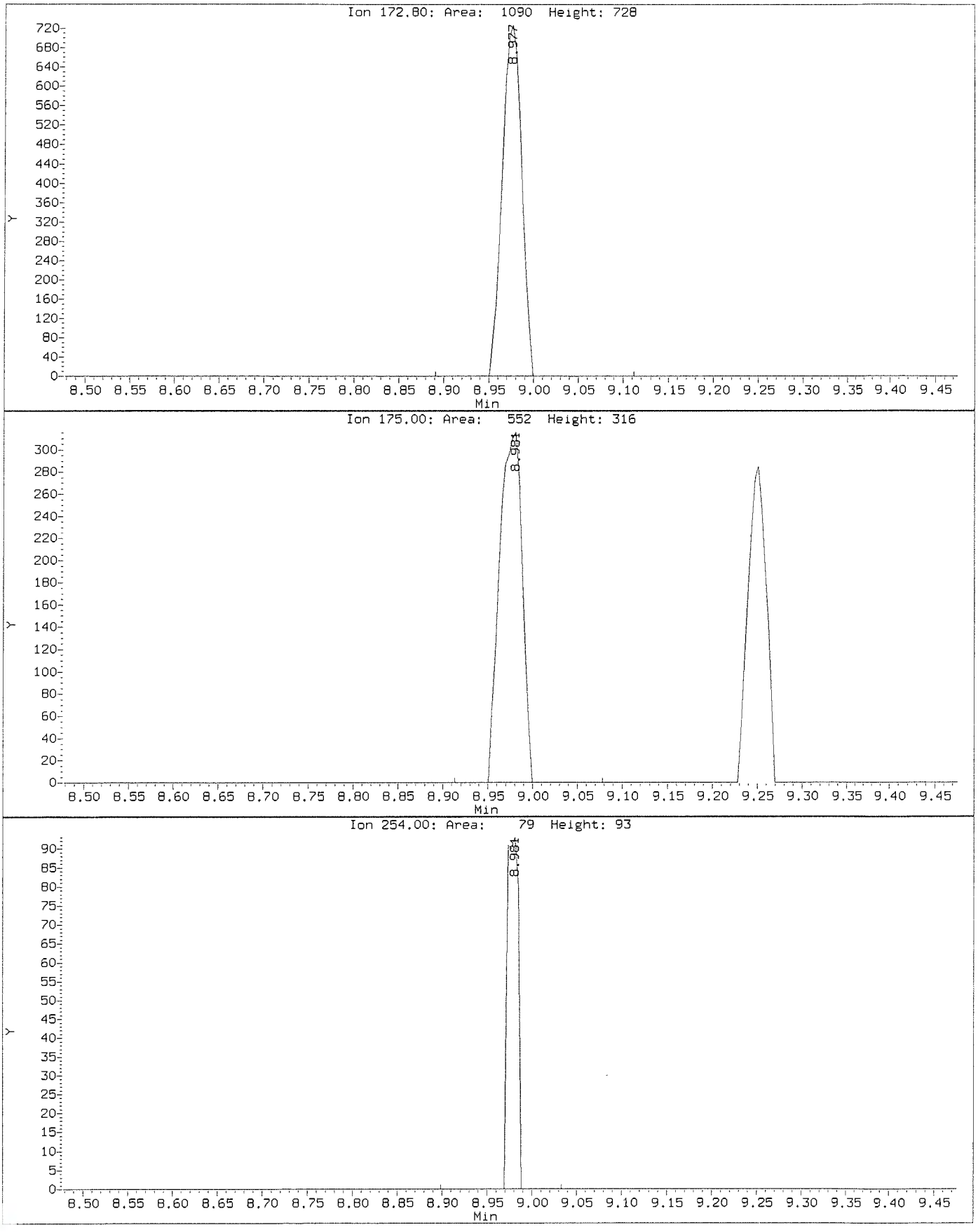
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Injection Date: 15-NOV-2021 14:58
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Bromoform
CAS Number: 75-25-2



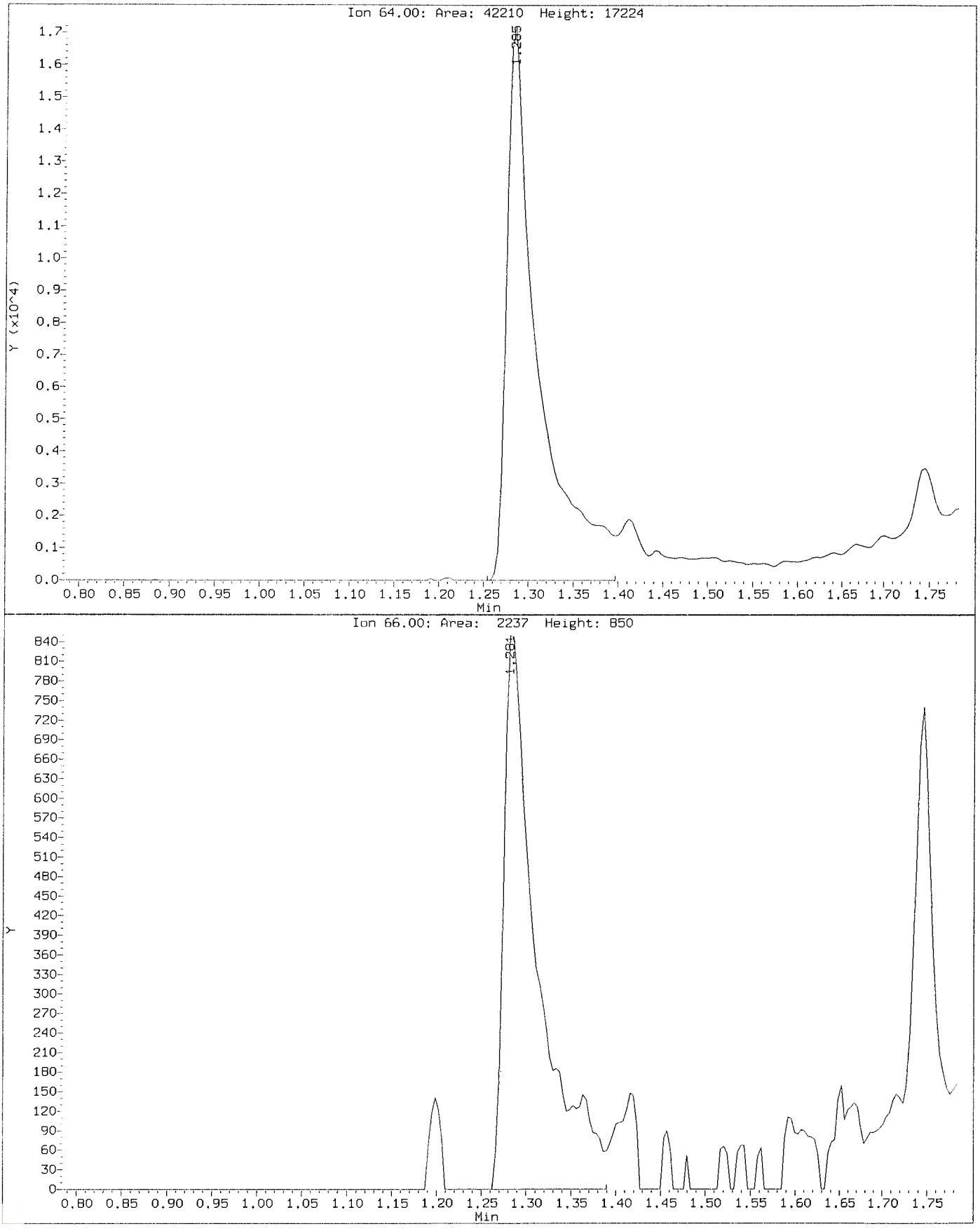
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Injection Date: 15-NOV-2021 14:58
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Bromoform
CAS Number: 75-25-2



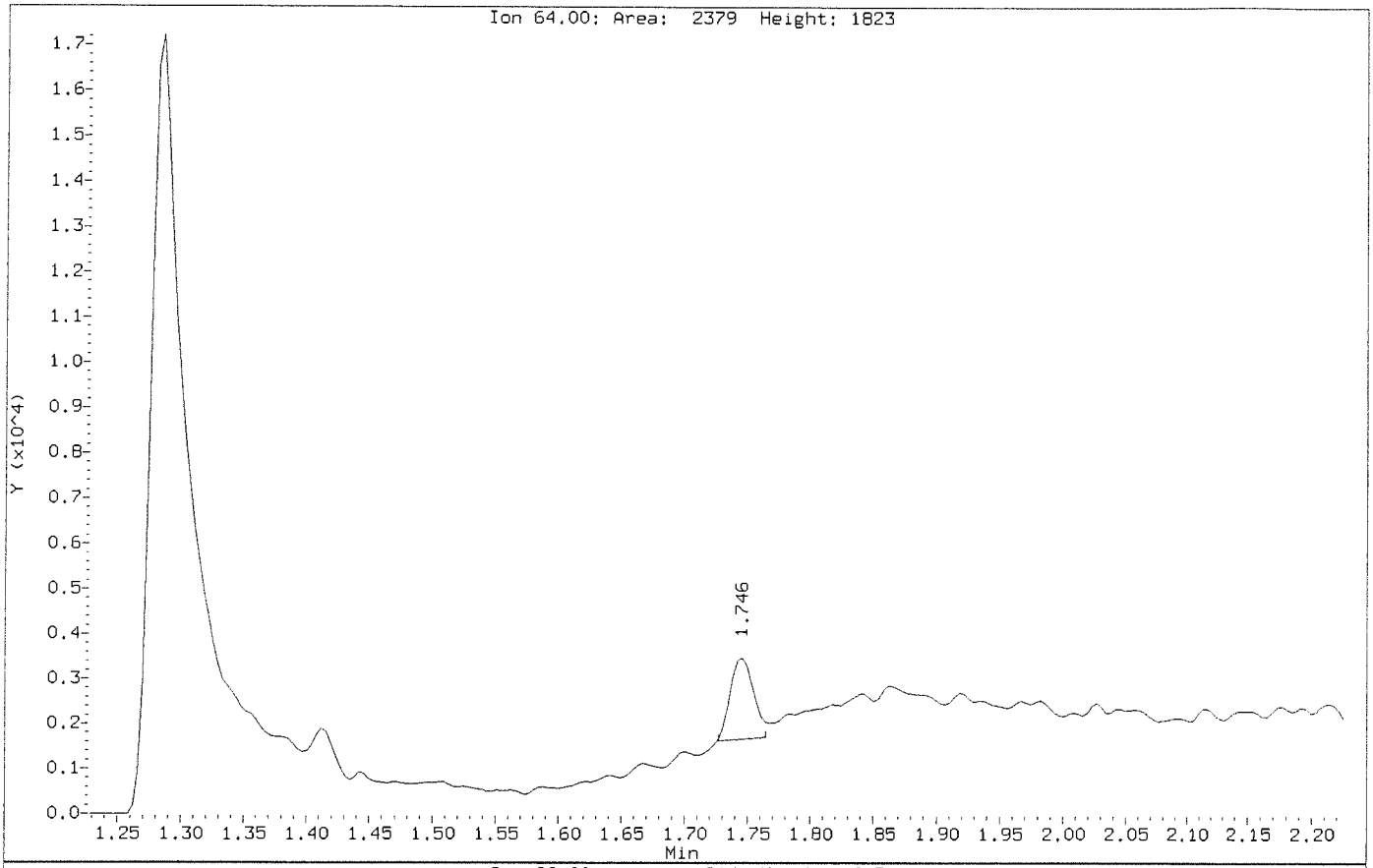
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Injection Date: 15-NOV-2021 14:58
Instrument: VOA9.i
Client Sample ID: VSTD001

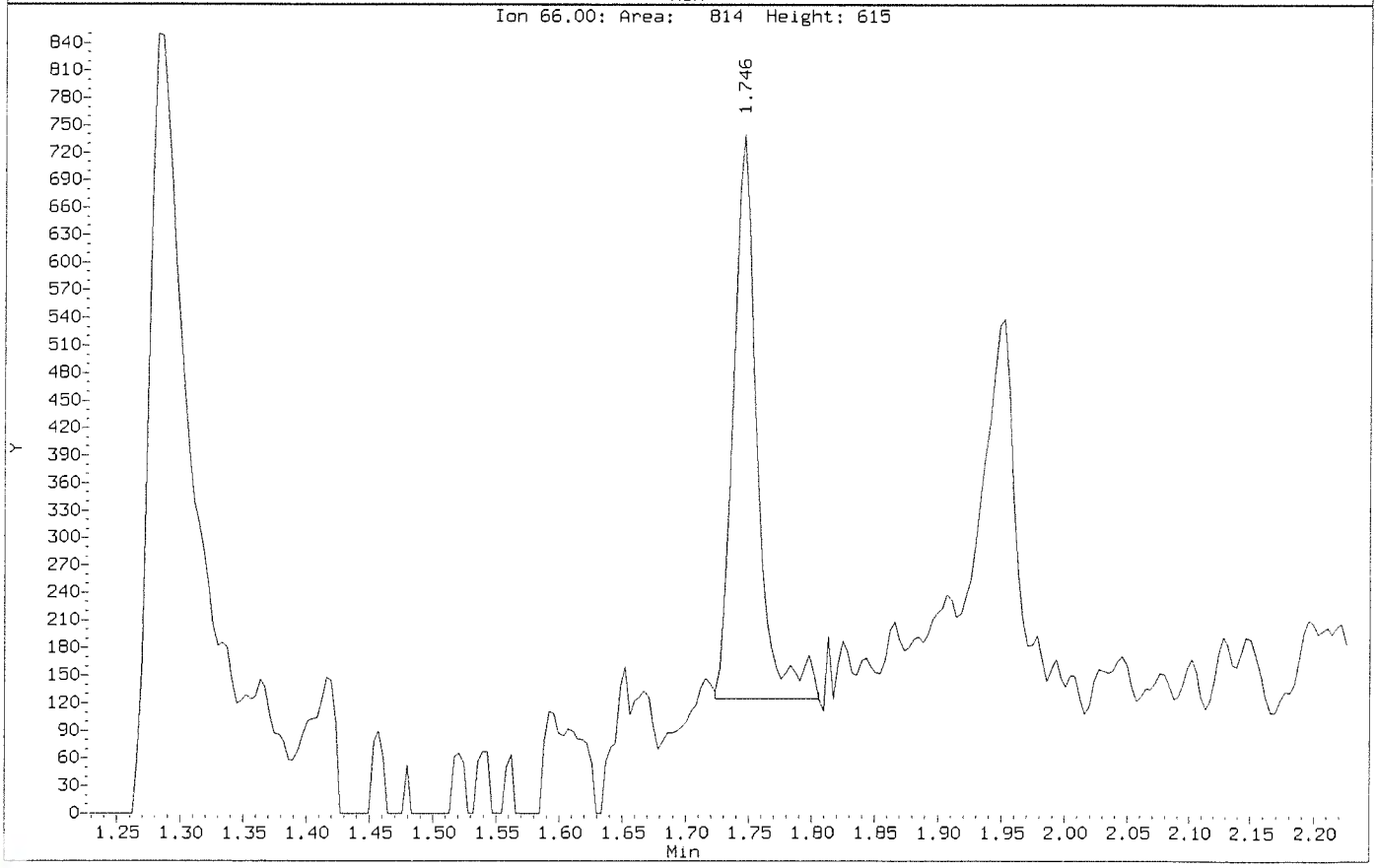
Compound: Chloroethane
CAS Number: 75-00-3



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111504.D
Injection Date: 15-NOV-2021 14:58
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Chloroethane
CAS Number: 75-00-3





ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111505.D
Lab Smp Id: VSTD002 Client Smp ID: VSTD002
Inj Date : 15-NOV-2021 15:20
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD002;VSTD002;1;4;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211115.b\8260C.m
Meth Date : 20-Dec-2021 15:39 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 14:58 Cal File: U111504.D
Als bottle: 6 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

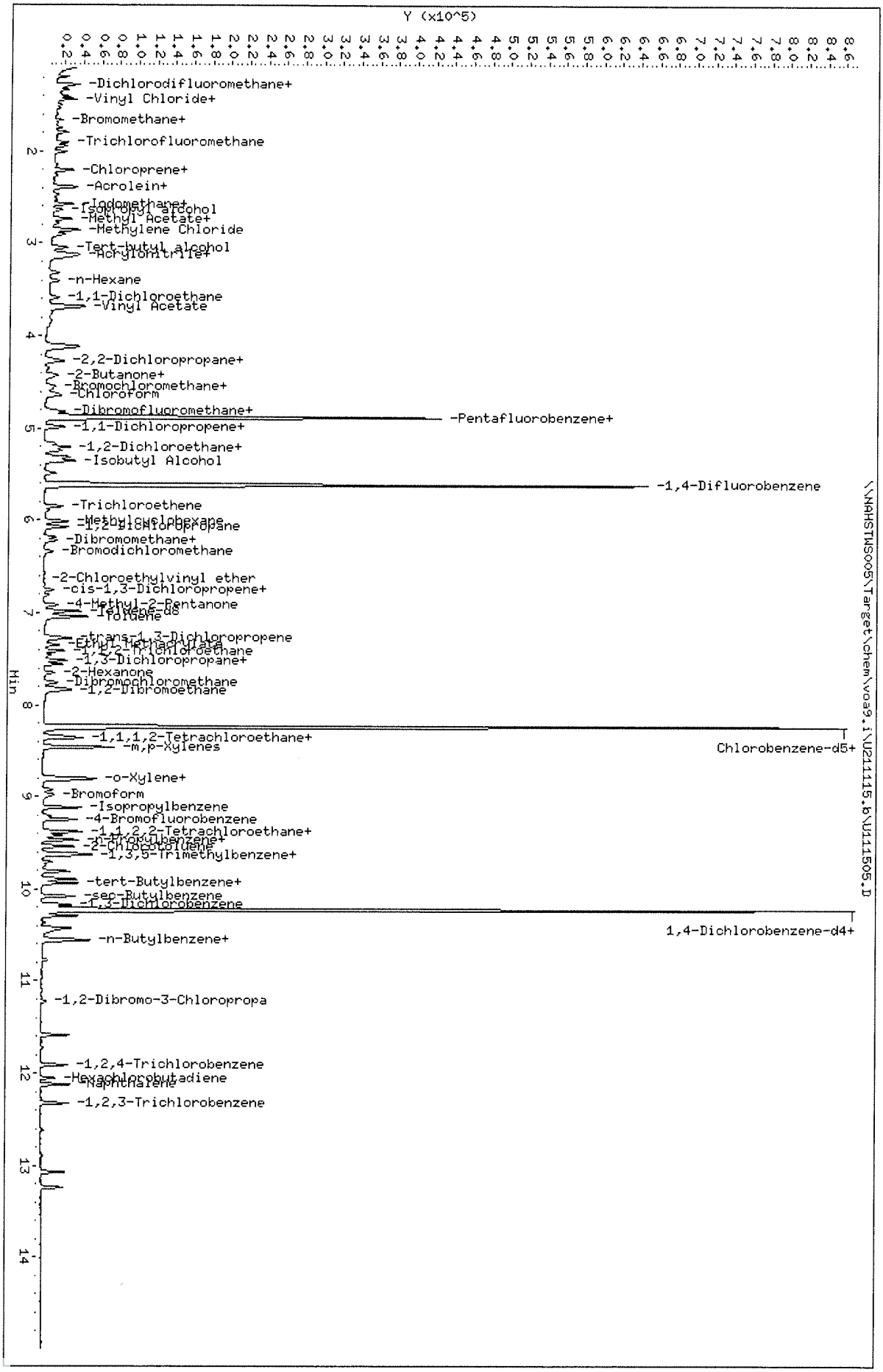
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.883	4.883	(1.000)	266816	50.0000	
* 36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	472045	50.0000	
* 47 Chlorobenzene-d5	117	8.242	8.242	(1.000)	430733	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	210030	50.0000	
$ 30 Dibromofluoromethane	113	4.819	4.819	(0.987)	5867	2.00000	1.27(a)
$ 35 1,2-Dichloroethane-d4	65	5.164	5.164	(1.058)	7830	2.00000	0.96(a)
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	23234	2.00000	2.07(a)
$ 69 4-Bromofluorobenzene	95	9.250	9.250	(1.122)	11258	2.00000	1.41(a)
60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	4304	2.00000	2.24(a)
31 1,1,1-Trichloroethane	97	4.812	4.812	(0.985)	6959	2.00000	1.81(a)
68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	9463	2.00000	2.14(a)
53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	5003	2.00000	1.97(a)
22 1,1-Dichloroethane	63	3.586	3.586	(0.734)	10144	2.00000	2.14(a)
11 1,1-Dichloroethene	96	2.386	2.386	(0.489)	5060	2.00000	2.12(a)
32 1,1-Dichloropropene	75	4.988	4.988	(0.888)	7710	2.00000	1.98(a)
93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	7830	2.00000	2.08(a)
71 1,2,3-Trichloropropane	75	9.415	9.415	(0.921)	7996	2.00000	1.84(a)
90 1,2,4-Trichlorobenzene	180	11.912	11.912	(1.165)	7719	2.00000	1.99(a)
79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	20790	2.00000	1.97(a)
89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	886	2.00000	3.58(a)
57 1,2-Dibromoethane	107	7.841	7.841	(0.951)	5849	2.00000	1.89(a)
88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	12429	2.00000	2.09(a)

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111505.D Page 2
Report Date: 20-Dec-2021 15:39

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33 1,2-Dichloroethane	62	5.243	5.243	(0.934)	8462	2.00000	1.98(a)
42 1,2-Dichloropropane	63	6.071	6.071	(1.081)	6025	2.00000	2.02(a)
75 1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	20514	2.00000	1.98(a)
83 1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	12191	2.00000	2.01(a)
54 1,3-Dichloropropane	76	7.556	7.556	(0.917)	10818	2.00000	2.00(a)
84 1,4-Dichlorobenzene	146	10.243	10.243	(1.002)	12630	2.00000	2.02(a)
26 2,2-Dichloropropane	77	4.257	4.257	(0.872)	4769	2.00000	1.77(a)
24 2-Butanone	43	4.347	4.347	(0.890)	5042	4.00000	3.61(a)
76 2-Chlorotoluene	91	9.539	9.539	(0.933)	18287	2.00000	2.02(a)
52 2-Hexanone	43	7.649	7.649	(0.928)	8112	4.00000	3.96(aH)
77 4-Chlorotoluene	91	9.632	9.632	(0.942)	20975	2.00000	2.00(a)
82 p-Isopropyltoluene	119	10.202	10.202	(0.998)	20170	2.00000	1.97(a)
45 4-Methyl-2-Pentanone	43	6.915	6.915	(0.839)	11742	4.00000	3.78(a)
10 Acetone	43	2.469	2.469	(0.506)	7509	4.00000	1.96(a)
37 Benzene	78	5.205	5.205	(0.927)	23270	2.00000	1.94(a)
74 Bromobenzene	156	9.374	9.374	(0.917)	6315	2.00000	1.93(a)
29 Bromochloromethane	128	4.542	4.542	(0.930)	3175	2.00000	2.10(a)
39 Bromodichloromethane	83	6.337	6.337	(1.129)	5486	2.00000	2.43(aM)
66 Bromoform	173	8.973	8.973	(1.089)	2438	2.00000	2.62(Ta)
6 Bromomethane	94	1.659	1.659	(0.340)	3804	2.00000	1.82(a)
19 Carbon Disulfide	76	2.574	2.574	(0.527)	25850	4.00000	3.91(a)
34 Carbon Tetrachloride	117	4.980	4.980	(0.887)	5276	2.00000	2.86(a)
59 Chlorobenzene	112	8.264	8.264	(1.003)	16817	2.00000	2.00(a)
7 Chloroethane	64	1.741	1.741	(0.357)	4101	2.00000	1.85(aM)
28 Chloroform	83	4.643	4.643	(0.951)	10070	2.00000	1.95(a)
3 Chloromethane	50	1.329	1.329	(0.272)	5164	2.00000	1.37(a)
27 cis-1,2-Dichloroethene	96	4.268	4.268	(0.874)	6784	2.00000	2.08(a)
46 cis-1,3-Dichloropropene	75	6.750	6.750	(1.202)	5706	2.00000	2.85(a)
55 Dibromochloromethane	129	7.747	7.747	(0.940)	3879	2.00000	2.65(a)
44 Dibromomethane	93	6.180	6.180	(1.101)	3989	2.00000	1.96(a)
2 Dichlorodifluoromethane	85	1.194	1.194	(0.245)	6494	2.00000	1.35(a)
61 Ethylbenzene	106	8.362	8.362	(1.015)	8437	2.00000	2.00(a)
91 Hexachlorobutadiene	225	12.054	12.054	(1.179)	2545	2.00000	1.78(a)
67 Isopropylbenzene	105	9.119	9.119	(1.106)	25310	2.00000	2.00(a)
62 m,p-Xylenes	106	8.463	8.463	(1.027)	20542	4.00000	3.95(a)
17 Methylene Chloride	84	2.855	2.855	(0.585)	6792	2.00000	2.16(a)
87 n-Butylbenzene	91	10.547	10.547	(1.032)	17916	2.00000	1.95(a)
73 n-Propylbenzene	91	9.467	9.467	(0.926)	28162	2.00000	1.97(a)
92 Naphthalene	128	12.122	12.122	(1.186)	23636	2.00000	2.04(a)
63 o-Xylene	106	8.800	8.800	(1.068)	9754	2.00000	1.89(a)
81 sec-Butylbenzene	105	10.078	10.078	(0.986)	23008	2.00000	1.96(a)
64 Styrene	104	8.815	8.815	(1.070)	16987	2.00000	1.92(a)
78 tert-Butylbenzene	119	9.891	9.891	(0.967)	16956	2.00000	1.94(a)
56 Tetrachloroethene	164	7.514	7.514	(0.912)	4981	2.00000	2.05(a)
50 Toluene	91	7.038	7.038	(0.854)	25594	2.00000	1.98(a)
20 trans-1,2-Dichloroethene	96	3.125	3.125	(0.640)	5365	2.00000	1.99(a)
51 trans-1,3-Dichloropropene	75	7.252	7.252	(1.292)	4426	2.00000	3.10(a)
38 Trichloroethene	130	5.850	5.850	(1.042)	6273	2.00000	2.03(a)
8 Trichlorofluoromethane	101	1.940	1.940	(0.397)	8751	2.00000	2.03(a)
5 Vinyl Chloride	62	1.408	1.408	(0.288)	6538	2.00000	2.02(a)

QC Flag Legend

T - Target compound detected outside RT window.
a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

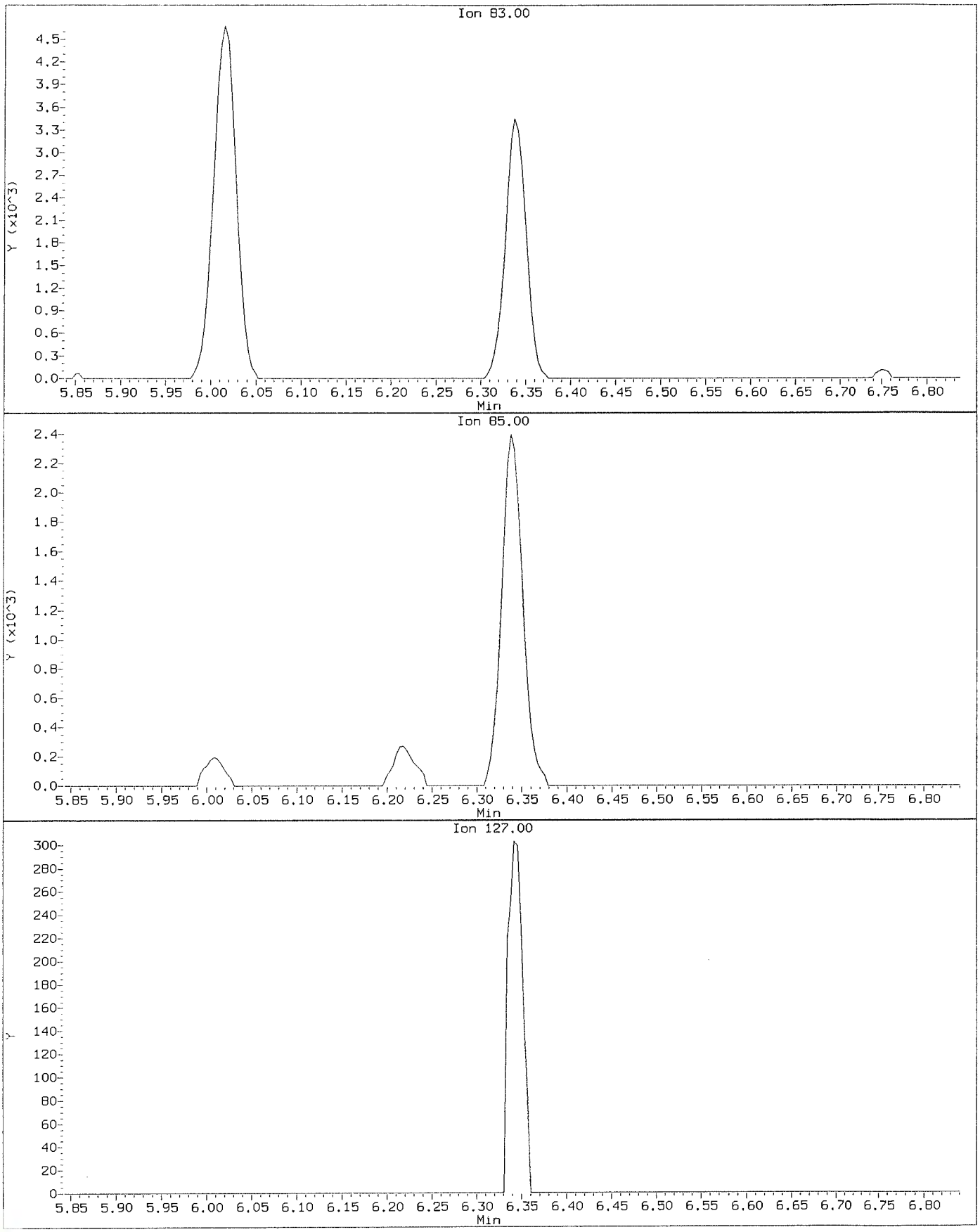


Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111505.D
Date : 15-NOV-2021 15:20
Client ID: VSTD002
Sample Info: VSTD002;VSTD002;1;4;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOa9.i
Operator: PC
Column diameter: 0.18

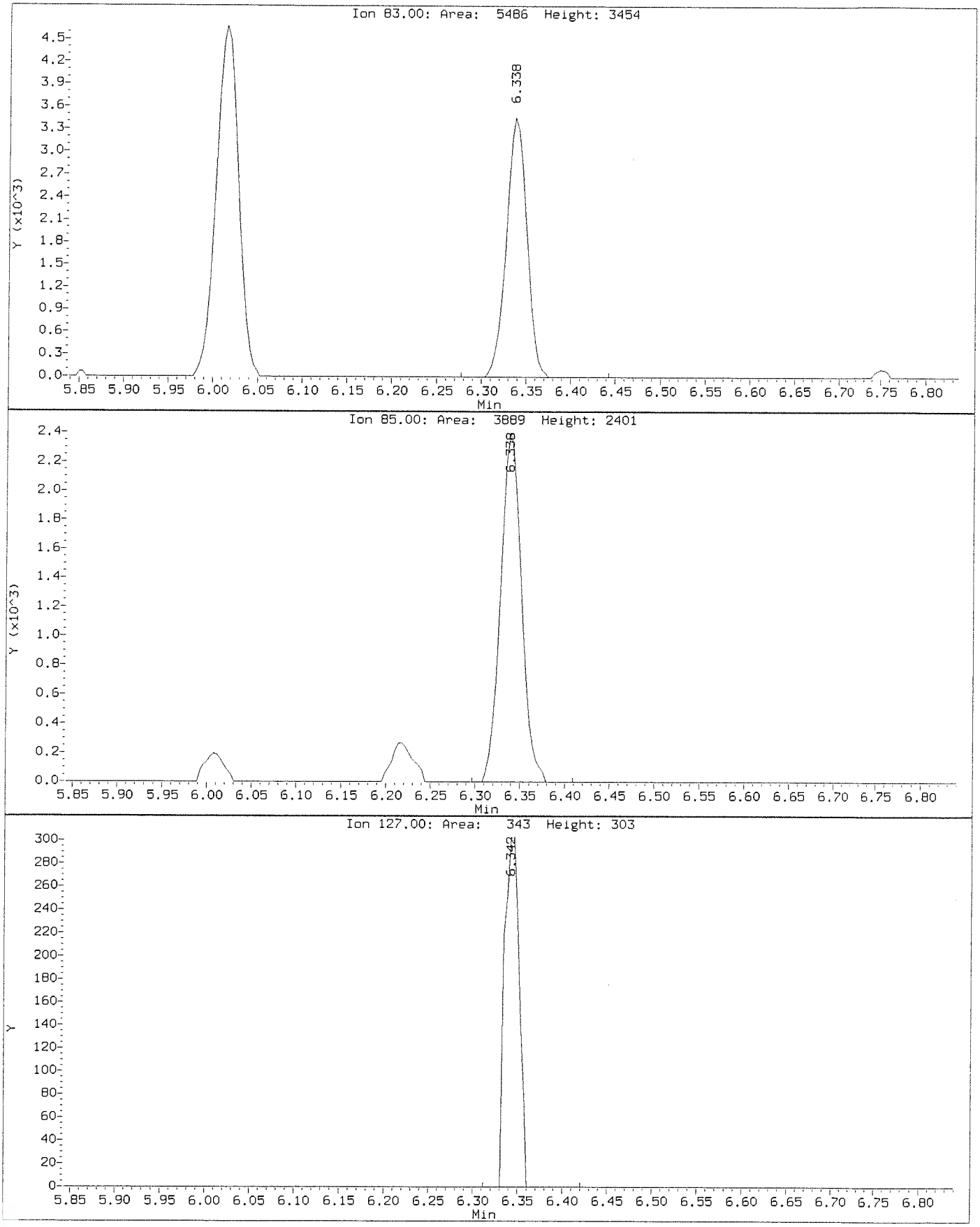
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Injection Date: 15-NOV-2021 15:20
Instrument: VOA9.i
Client Sample ID: VSTD002

Compound: Bromodichloromethane
CAS Number: 75-27-4



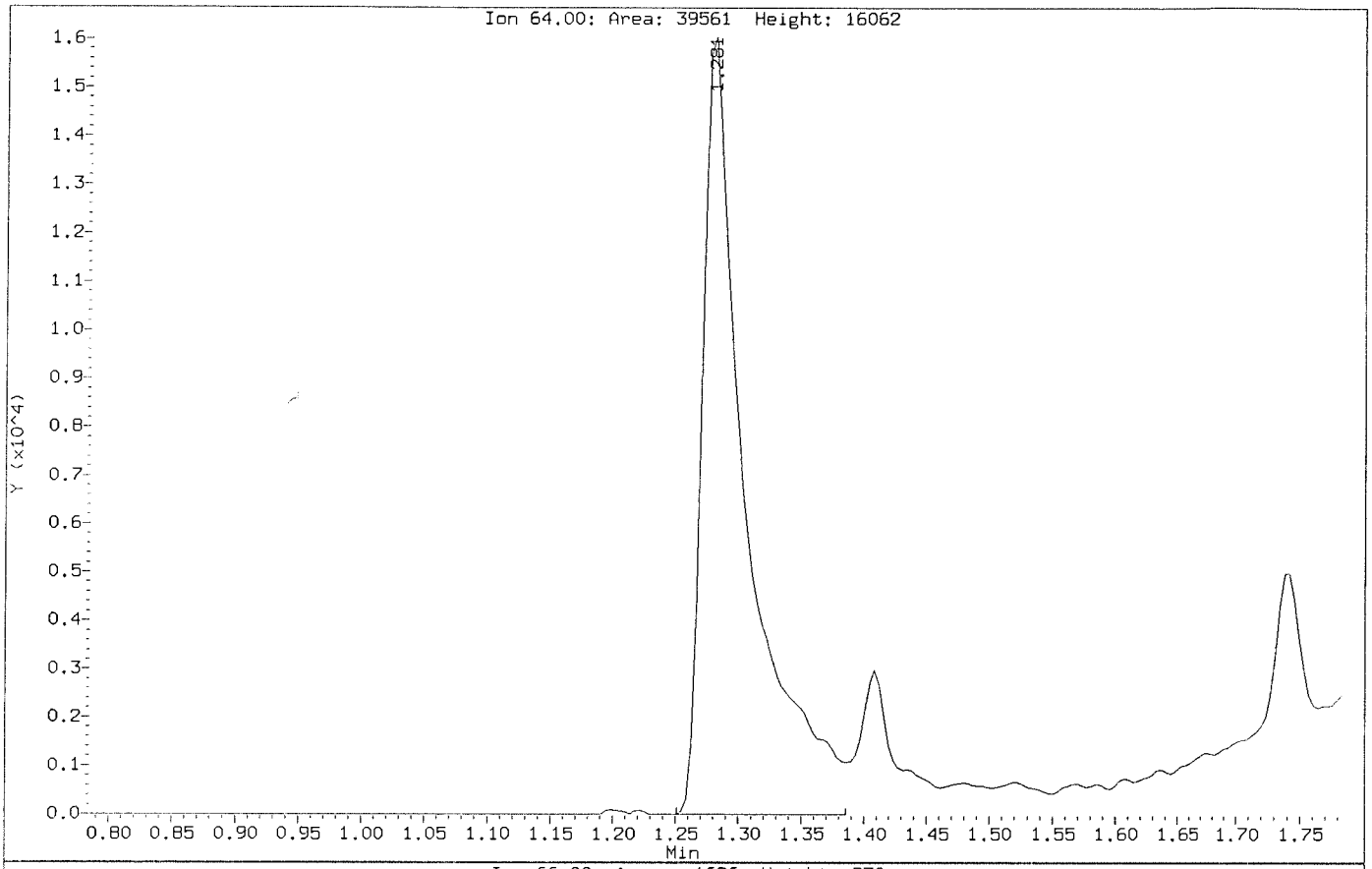
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Injection Date: 15-NOV-2021 15:20
Instrument: VOA9.i
Client Sample ID: VSTD002

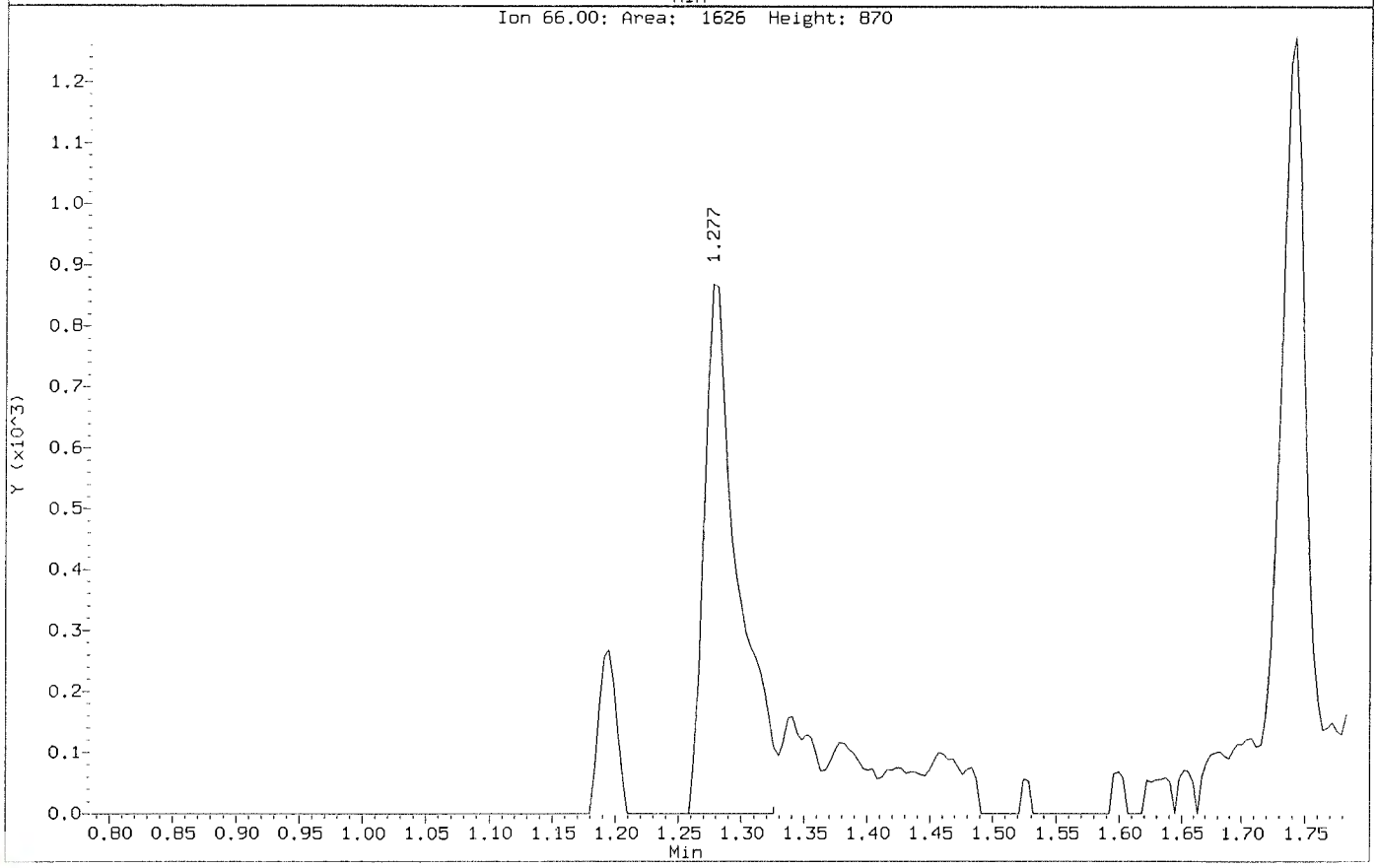
Compound: Bromodichloromethane
CAS Number: 75-27-4



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111505.D
Injection Date: 15-NOV-2021 15:20
Instrument: VOA9.i
Client Sample ID: VSTD002

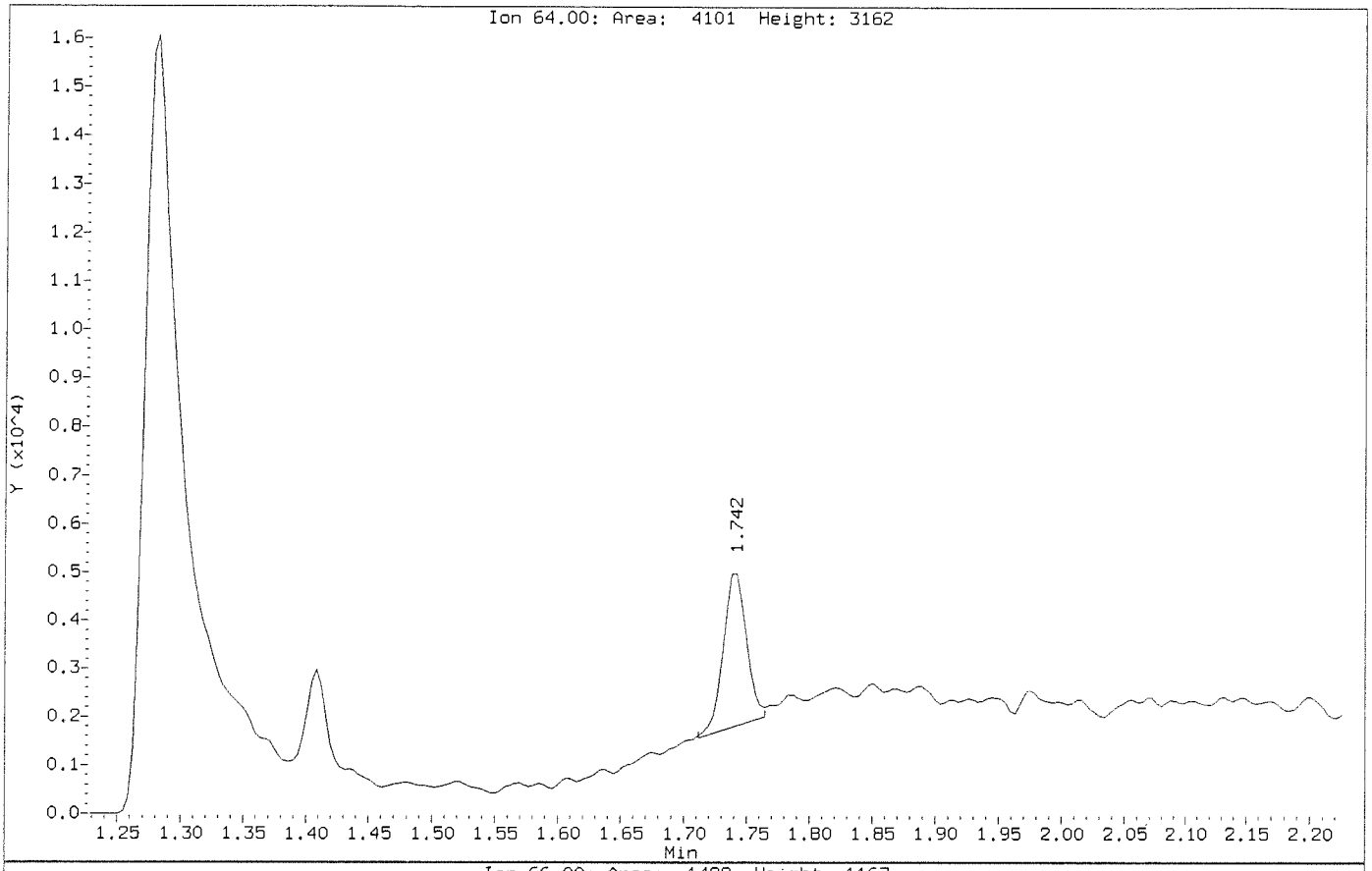
Compound: Chloroethane
CAS Number: 75-00-3

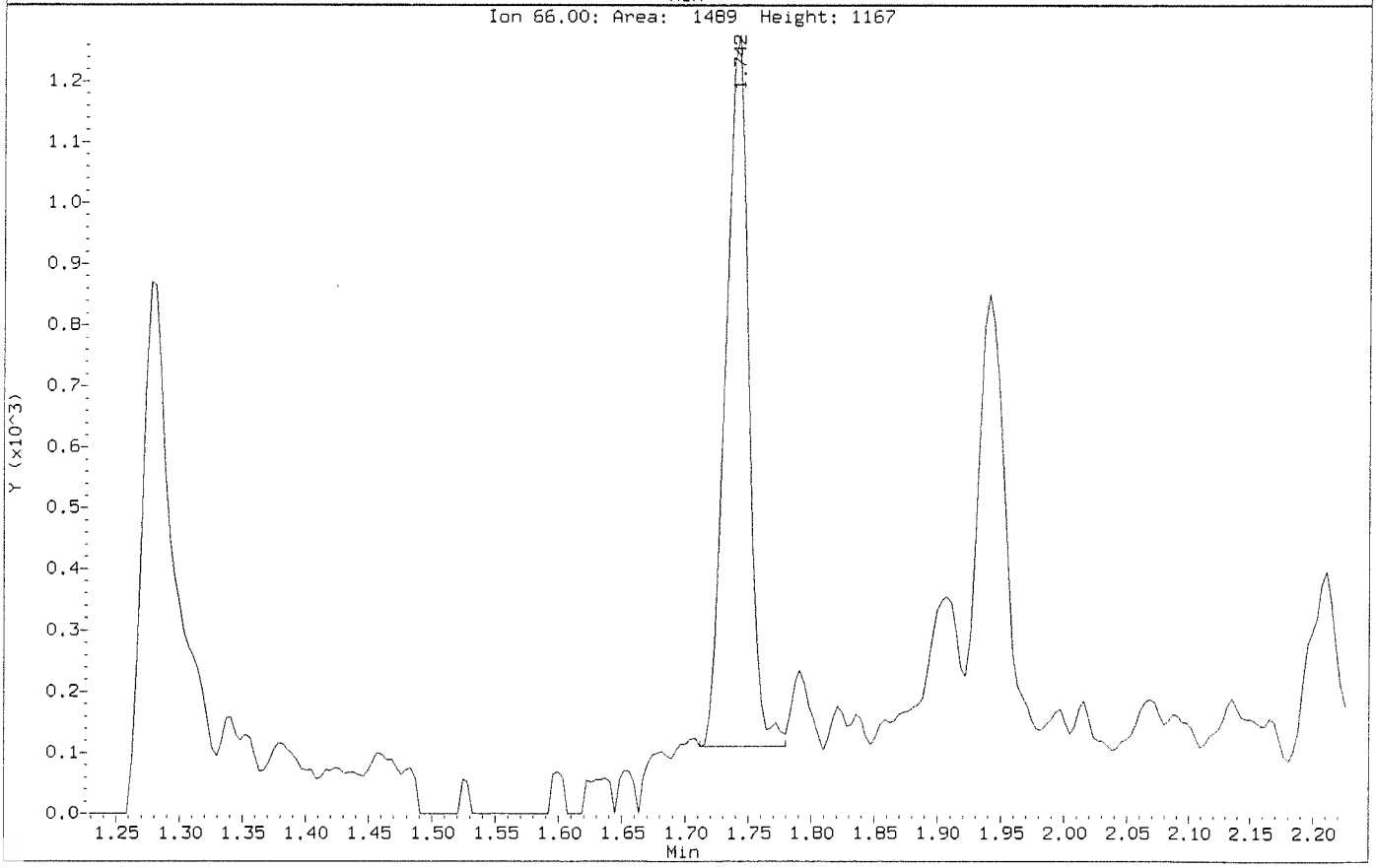




Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111505.D
Injection Date: 15-NOV-2021 15:20
Instrument: VOA9.i
Client Sample ID: VSTD002

Compound: Chloroethane
CAS Number: 75-00-3





ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111506.D
Lab Smp Id: VSTD005 Client Smp ID: VSTD005
Inj Date : 15-NOV-2021 15:43
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD005;VSTD005;1;5;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211115.b\8260C.m
Meth Date : 20-Dec-2021 15:39 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 15:20 Cal File: U111505.D
Als bottle: 7 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

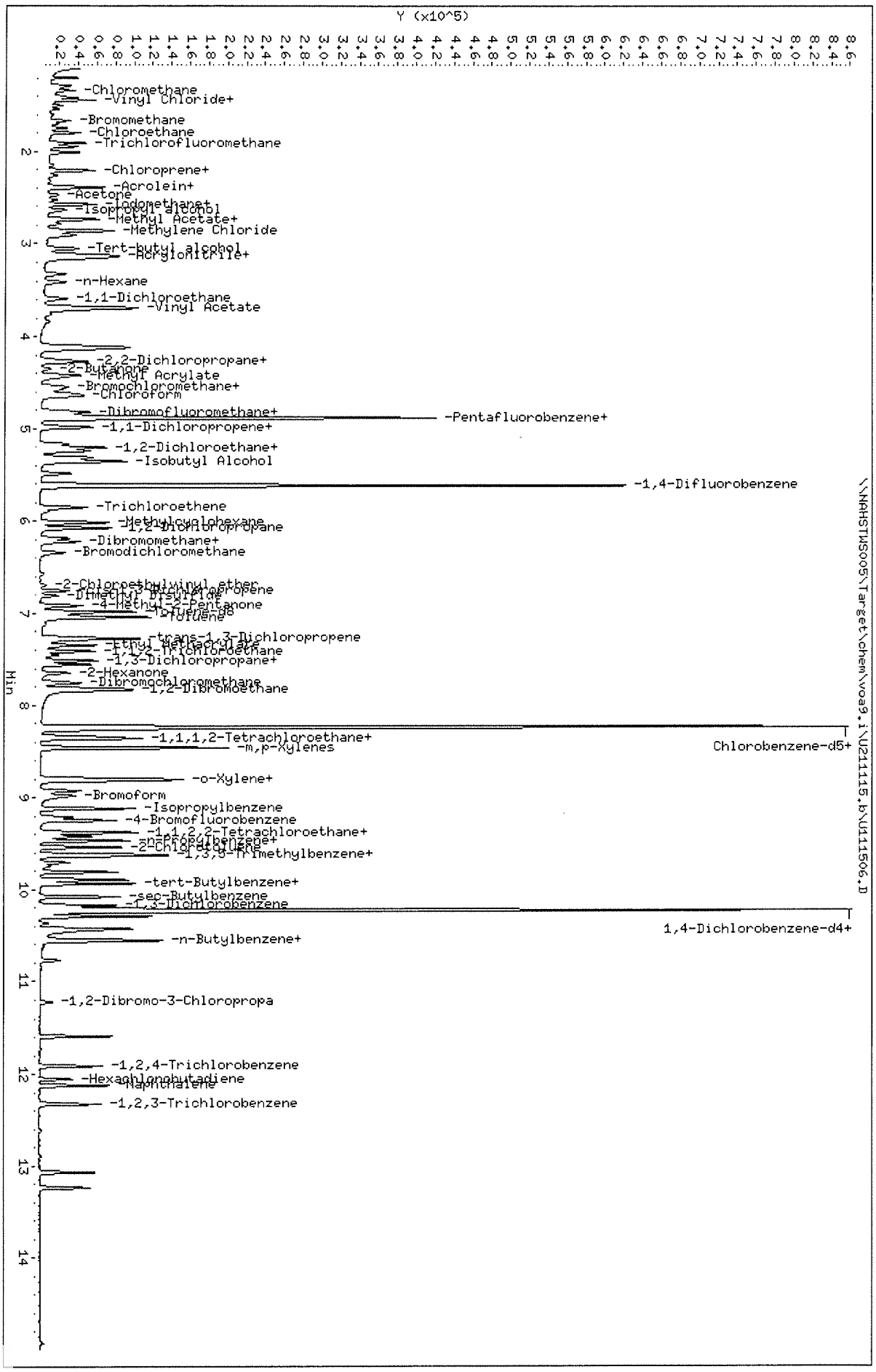
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.883	4.883	(1.000)	259004	50.0000	
*	36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	458652	50.0000	
*	47 Chlorobenzene-d5	117	8.242	8.242	(1.000)	409495	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	203243	50.0000	
$	30 Dibromofluoromethane	113	4.819	4.819	(0.987)	15313	5.00000	4.87(a)
$	35 1,2-Dichloroethane-d4	65	5.168	5.168	(1.058)	19646	5.00000	4.86(a)
$	48 Toluene-d8	98	6.978	6.978	(0.847)	58951	5.00000	5.53
$	69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	23787	5.00000	4.79(a)
	60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	11768	5.00000	4.90(a)
	31 1,1,1-Trichloroethane	97	4.812	4.812	(0.985)	17435	5.00000	4.67(a)
	68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	22452	5.00000	5.24
	53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	13113	5.00000	5.43
	22 1,1-Dichloroethane	63	3.590	3.590	(0.735)	24605	5.00000	5.34
	11 1,1-Dichloroethene	96	2.390	2.390	(0.490)	11651	5.00000	5.04
	32 1,1-Dichloropropene	75	4.992	4.992	(0.889)	19635	5.00000	5.21
	93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	18192	5.00000	4.99(a)
	71 1,2,3-Trichloropropane	75	9.419	9.419	(0.921)	21536	5.00000	5.12
	90 1,2,4-Trichlorobenzene	180	11.912	11.912	(1.165)	18332	5.00000	4.90(a)
	79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	51830	5.00000	5.08
	89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	2022	5.00000	5.15
	57 1,2-Dibromoethane	107	7.841	7.841	(0.951)	15326	5.00000	5.22
	88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	30096	5.00000	5.25

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111506.D Page 2
Report Date: 20-Dec-2021 15:39

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33 1,2-Dichloroethane	62	5.246	5.246	(0.935)	22428	5.00000	5.42
42 1,2-Dichloropropane	63	6.075	6.075	(1.082)	15359	5.00000	5.32
75 1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	50426	5.00000	5.04
83 1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	30110	5.00000	5.14
54 1,3-Dichloropropane	76	7.556	7.556	(0.917)	28565	5.00000	5.55
84 1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	31699	5.00000	5.26
26 2,2-Dichloropropane	77	4.261	4.261	(0.873)	11813	5.00000	4.52(a)
24 2-Butanone	43	4.351	4.351	(0.891)	13640	10.0000	10.07
76 2-Chlorotoluene	91	9.539	9.539	(0.933)	46528	5.00000	5.31
52 2-Hexanone	43	7.649	7.649	(0.928)	20582	10.0000	10.58(H)
77 4-Chlorotoluene	91	9.632	9.632	(0.942)	53956	5.00000	5.31
82 p-Isopropyltoluene	119	10.202	10.202	(0.998)	49045	5.00000	4.95(a)
45 4-Methyl-2-Pentanone	43	6.915	6.915	(0.839)	29230	10.0000	9.91
10 Acetone	43	2.472	2.472	(0.506)	12006	10.0000	7.52
37 Benzene	78	5.205	5.205	(0.927)	59955	5.00000	5.16
74 Bromobenzene	156	9.374	9.374	(0.917)	16545	5.00000	5.24
29 Bromochloromethane	128	4.545	4.545	(0.931)	7796	5.00000	5.33
39 Bromodichloromethane	83	6.337	6.337	(1.129)	15337	5.00000	5.06
66 Bromoform	173	8.973	8.973	(1.089)	6778	5.00000	4.91(a)
6 Bromomethane	94	1.663	1.663	(0.341)	9672	5.00000	5.60
19 Carbon Disulfide	76	2.577	2.577	(0.528)	63439	10.0000	9.89
34 Carbon Tetrachloride	117	4.980	4.980	(0.887)	13108	5.00000	4.99(a)
59 Chlorobenzene	112	8.264	8.264	(1.003)	41501	5.00000	5.19
7 Chloroethane	64	1.741	1.741	(0.357)	11038	5.00000	5.15(M)
28 Chloroform	83	4.647	4.647	(0.952)	26919	5.00000	5.39
3 Chloromethane	50	1.333	1.333	(0.273)	13015	5.00000	4.51(a)
27 cis-1,2-Dichloroethene	96	4.276	4.276	(0.876)	16593	5.00000	5.24
46 cis-1,3-Dichloropropene	75	6.750	6.750	(1.202)	15790	5.00000	4.89(a)
55 Dibromochloromethane	129	7.747	7.747	(0.940)	11164	5.00000	5.01
44 Dibromomethane	93	6.180	6.180	(1.101)	10158	5.00000	5.16
2 Dichlorodifluoromethane	85	1.198	1.198	(0.245)	15309	5.00000	4.31(a)
61 Ethylbenzene	106	8.362	8.362	(1.015)	20541	5.00000	5.14
91 Hexachlorobutadiene	225	12.054	12.054	(1.179)	6204	5.00000	4.48(a)
67 Isopropylbenzene	105	9.115	9.115	(1.106)	60913	5.00000	5.06
62 m,p-Xylenes	106	8.463	8.463	(1.027)	51822	10.0000	10.49
17 Methylene Chloride	84	2.859	2.859	(0.585)	15812	5.00000	5.18
87 n-Butylbenzene	91	10.547	10.547	(1.032)	43095	5.00000	4.85(a)
73 n-Propylbenzene	91	9.467	9.467	(0.926)	70372	5.00000	5.09
92 Naphthalene	128	12.122	12.122	(1.186)	53513	5.00000	4.77(a)
63 o-Xylene	106	8.800	8.800	(1.068)	25615	5.00000	5.23
81 sec-Butylbenzene	105	10.079	10.079	(0.986)	56145	5.00000	4.95(a)
64 Styrene	104	8.815	8.815	(1.070)	43765	5.00000	5.21
78 tert-Butylbenzene	119	9.891	9.891	(0.967)	42020	5.00000	4.98(a)
56 Tetrachloroethene	164	7.514	7.514	(0.912)	11689	5.00000	5.06
50 Toluene	91	7.038	7.038	(0.854)	64107	5.00000	5.23
20 trans-1,2-Dichloroethene	96	3.128	3.128	(0.641)	13129	5.00000	5.04
51 trans-1,3-Dichloropropene	75	7.252	7.252	(1.292)	12599	5.00000	5.02
38 Trichloroethene	130	5.850	5.850	(1.042)	15133	5.00000	5.05
8 Trichlorofluoromethane	101	1.944	1.944	(0.398)	20844	5.00000	4.99(a)
5 Vinyl Chloride	62	1.412	1.412	(0.289)	15859	5.00000	5.06

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

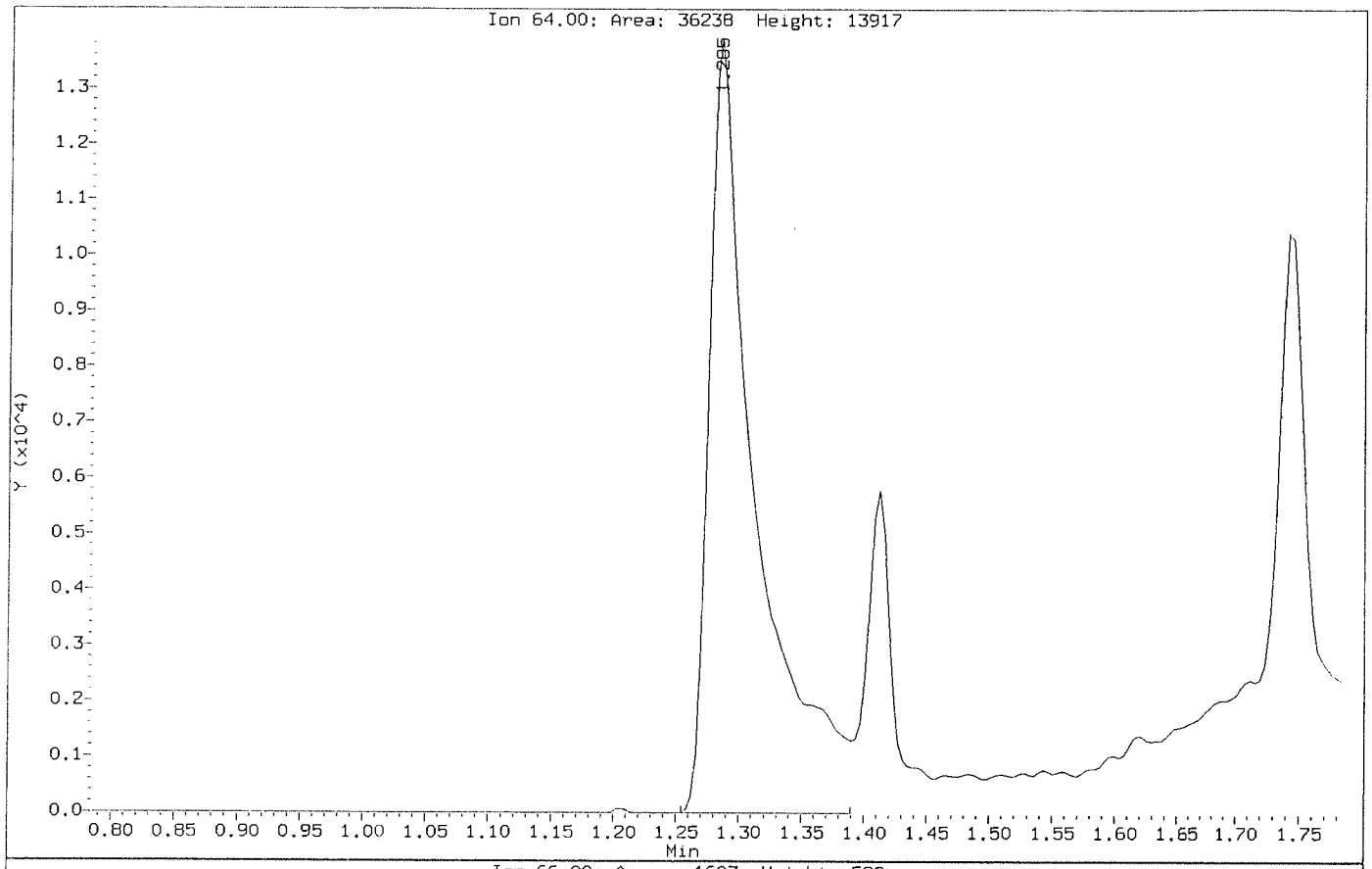


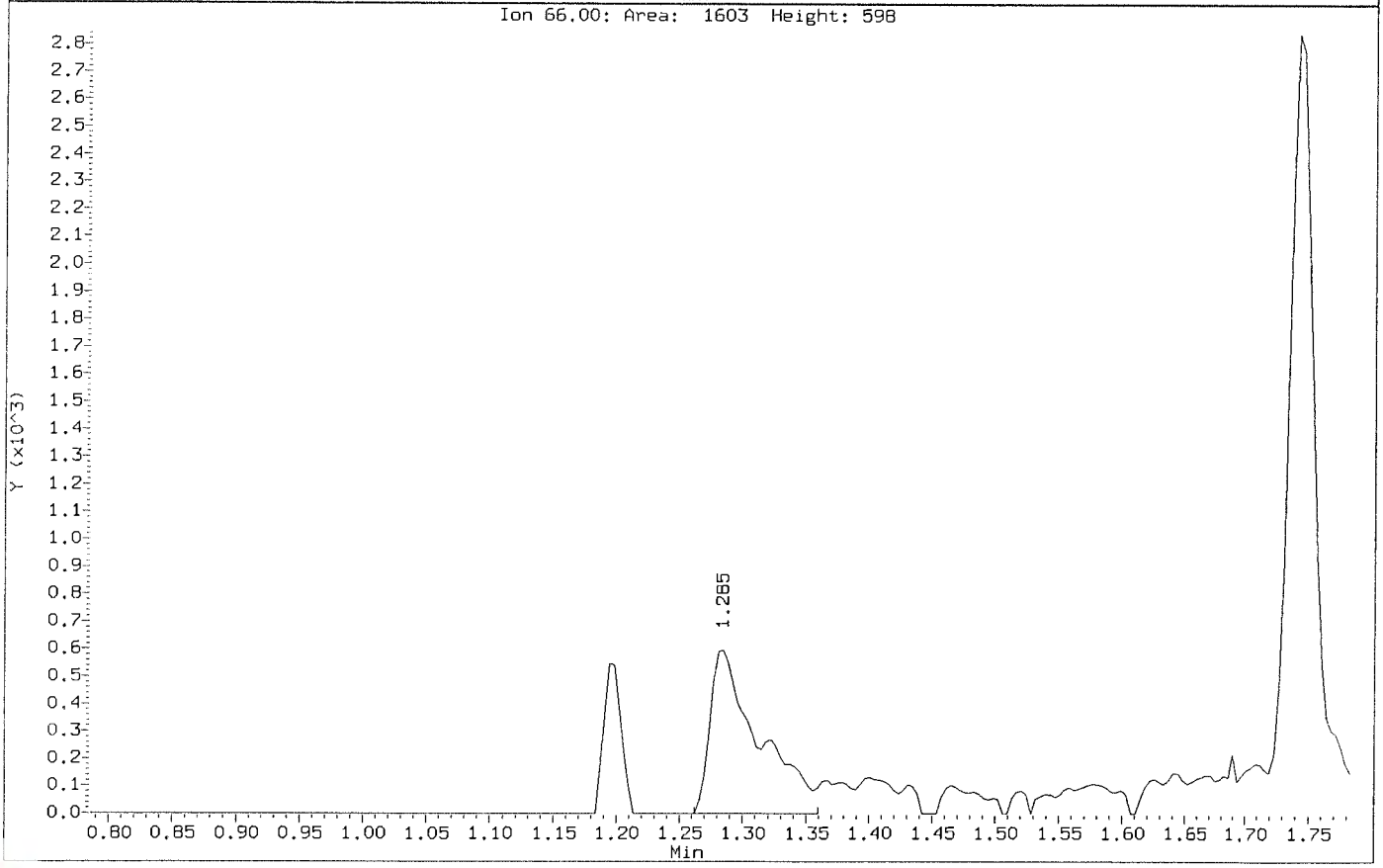
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Date : 15-NOV-2021 15:43
Client ID: VSTD005
Sample Info: VSTD005;VSTD005;1;5;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111506.D
Injection Date: 15-NOV-2021 15:43
Instrument: VOA9.i
Client Sample ID: VSTD005

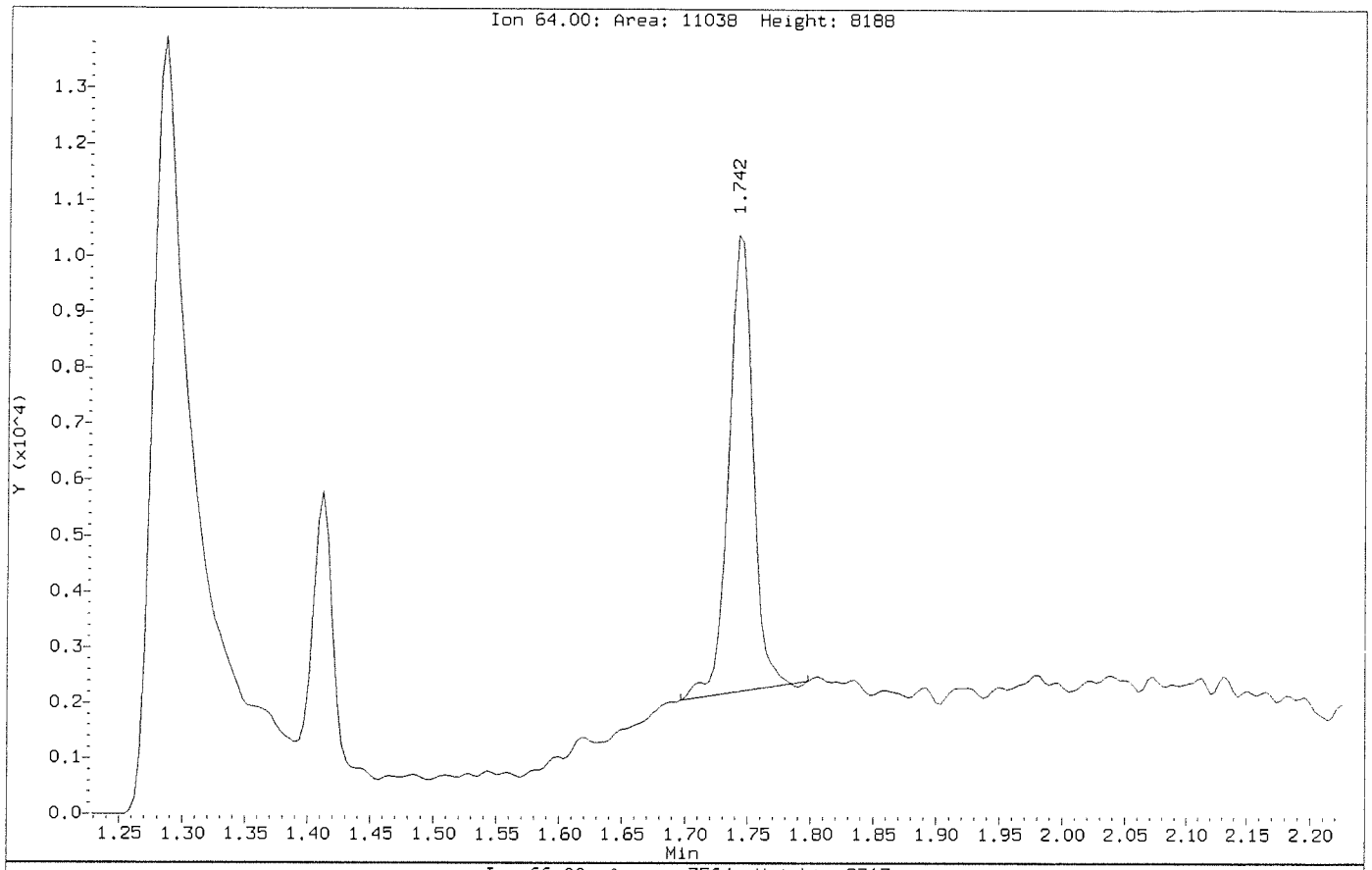
Compound: Chloroethane
CAS Number: 75-00-3

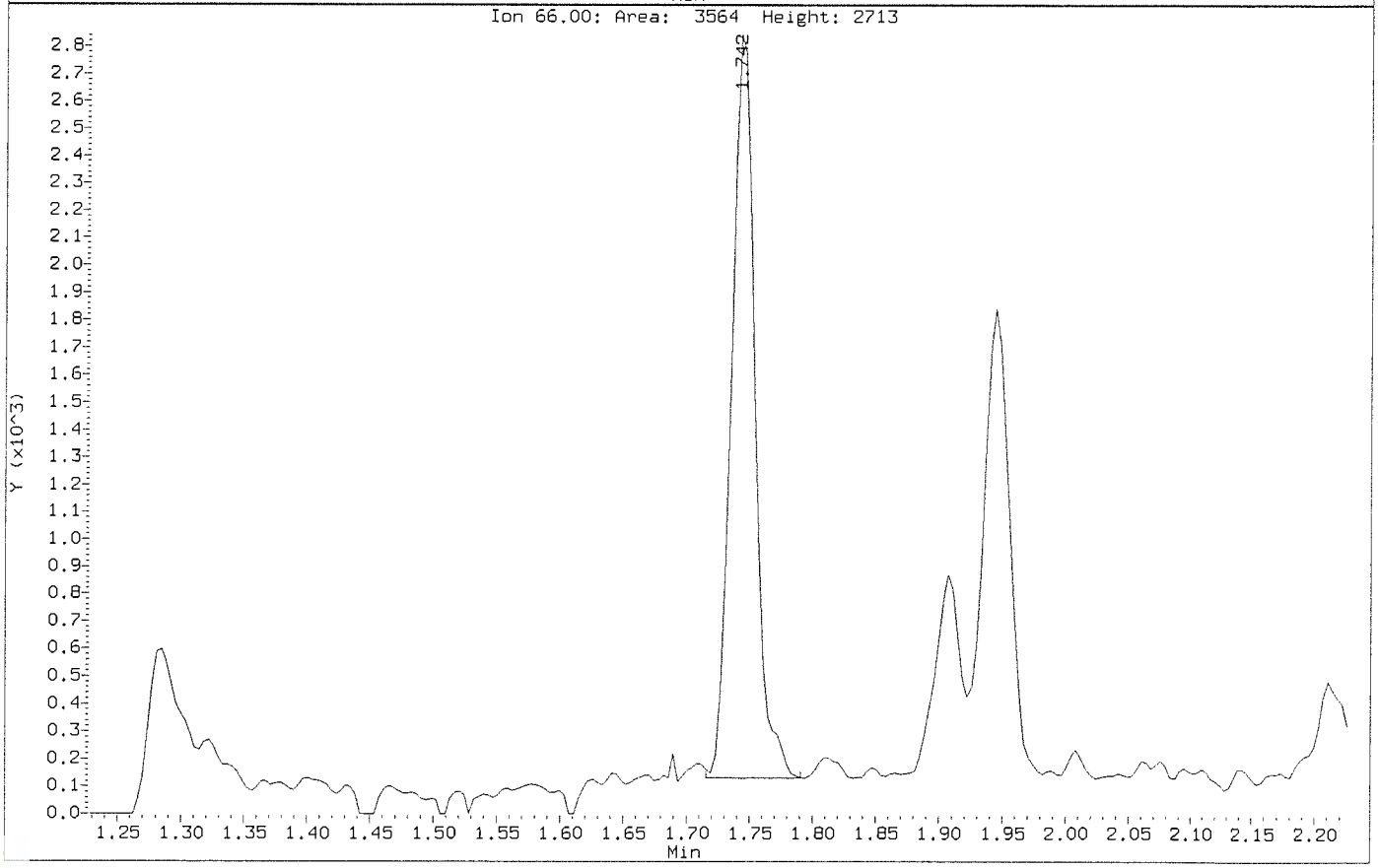




Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111506.D
Injection Date: 15-NOV-2021 15:43
Instrument: VOA9.i
Client Sample ID: VSTD005

Compound: Chloroethane
CAS Number: 75-00-3





ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111507.D
Lab Smp Id: VSTD020 Client Smp ID: VSTD020
Inj Date : 15-NOV-2021 16:05
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD020;VSTD020;1;6;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211115.b\8260C.m
Meth Date : 20-Dec-2021 15:39 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 15:43 Cal File: U111506.D
Als bottle: 8 Calibration Sample, Level: 6
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

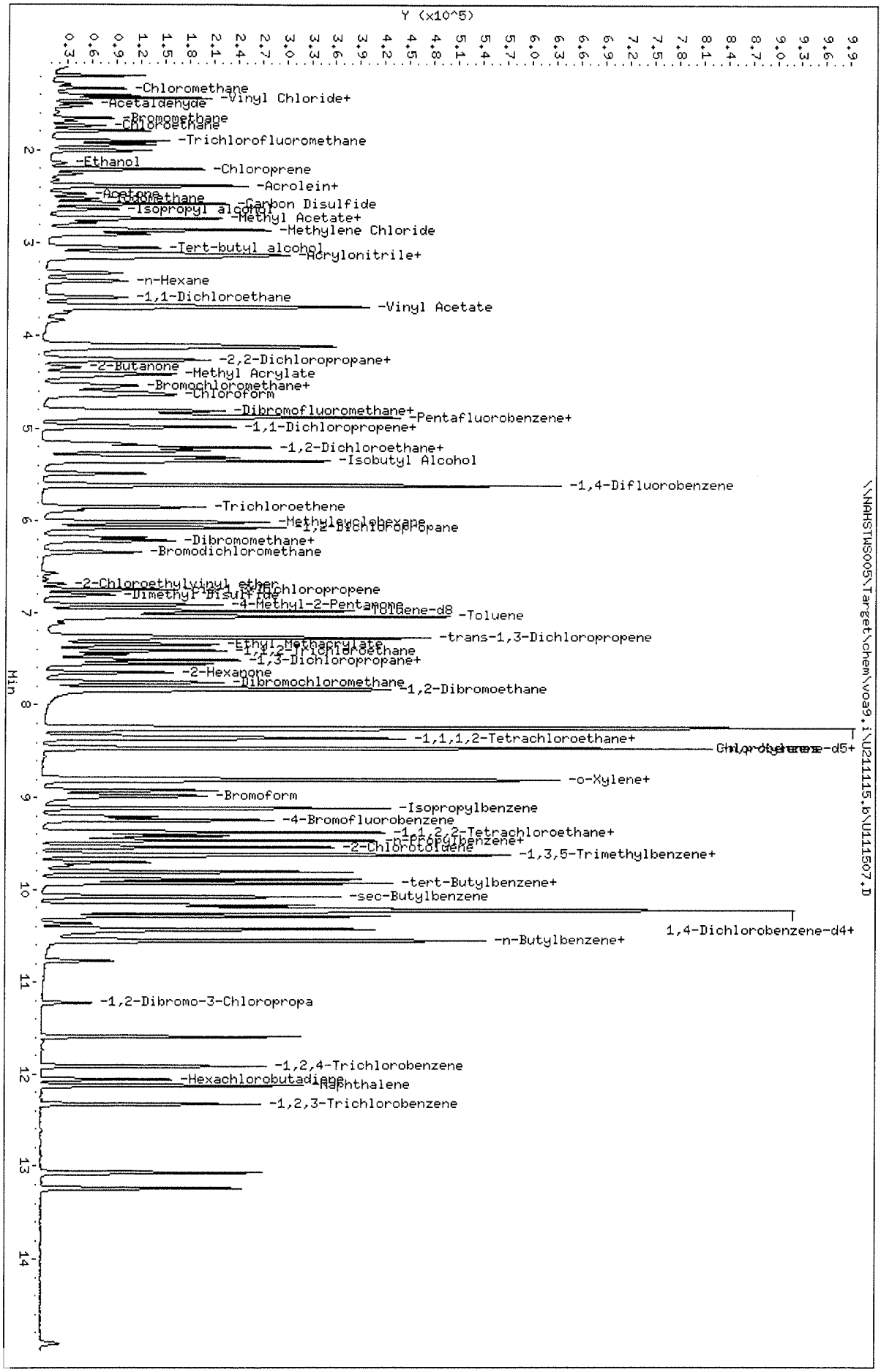
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.879	4.879	(1.000)	264317	50.0000	
* 36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	463809	50.0000	
* 47 Chlorobenzene-d5	117	8.241	8.241	(1.000)	419294	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.224	10.224	(1.000)	209272	50.0000	
$ 30 Dibromofluoromethane	113	4.815	4.815	(0.987)	59371	20.0000	20.90
$ 35 1,2-Dichloroethane-d4	65	5.164	5.164	(1.058)	71255	20.0000	21.13
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	222856	20.0000	20.42
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	86314	20.0000	20.41
60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	54596	20.0000	19.29
31 1,1,1-Trichloroethane	97	4.811	4.811	(0.986)	77494	20.0000	20.36
68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	93137	20.0000	21.14
53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	51258	20.0000	20.74
22 1,1-Dichloroethane	63	3.586	3.586	(0.735)	97169	20.0000	20.69
11 1,1-Dichloroethene	96	2.382	2.382	(0.488)	47090	20.0000	19.98
32 1,1-Dichloropropene	75	4.988	4.988	(0.888)	77211	20.0000	20.27
93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	74907	20.0000	19.98
71 1,2,3-Trichloropropane	75	9.419	9.419	(0.921)	88639	20.0000	20.49
90 1,2,4-Trichlorobenzene	180	11.915	11.915	(1.165)	75774	20.0000	19.67
79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	221020	20.0000	21.06
89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	11576	20.0000	17.55
57 1,2-Dibromoethane	107	7.840	7.840	(0.951)	65351	20.0000	21.77
88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	121358	20.0000	20.56

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111507.D Page 2
Report Date: 20-Dec-2021 15:39

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.242	5.242	(0.934)	86931	20.0000	20.77
42	1,2-Dichloropropane	63	6.071	6.071	(1.081)	60765	20.0000	20.82
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	211420	20.0000	20.54
83	1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	121441	20.0000	20.14
54	1,3-Dichloropropane	76	7.555	7.555	(0.917)	111361	20.0000	21.15
84	1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	125166	20.0000	20.18
26	2,2-Dichloropropane	77	4.257	4.257	(0.872)	50678	20.0000	19.04
24	2-Butanone	43	4.343	4.343	(0.890)	57283	40.0000	41.44
76	2-Chlorotoluene	91	9.538	9.538	(0.933)	184931	20.0000	20.52
52	2-Hexanone	43	7.645	7.645	(0.928)	89034	40.0000	44.73(H)
77	4-Chlorotoluene	91	9.628	9.628	(0.942)	217131	20.0000	20.79
82	p-Isopropyltoluene	119	10.202	10.202	(0.998)	209271	20.0000	20.52
45	4-Methyl-2-Pentanone	43	6.911	6.911	(0.839)	127487	40.0000	42.21
10	Acetone	43	2.468	2.468	(0.506)	42250	40.0000	42.21
37	Benzene	78	5.205	5.205	(0.927)	239195	20.0000	20.39
74	Bromobenzene	156	9.374	9.374	(0.917)	68062	20.0000	20.97
29	Bromochloromethane	128	4.538	4.538	(0.930)	32696	20.0000	21.93
39	Bromodichloromethane	83	6.337	6.337	(1.129)	68589	20.0000	18.83
66	Bromoform	173	8.972	8.972	(1.089)	32750	20.0000	17.80
6	Bromomethane	94	1.655	1.655	(0.339)	34362	20.0000	20.80
19	Carbon Disulfide	76	2.573	2.573	(0.528)	263250	40.0000	40.24
34	Carbon Tetrachloride	117	4.976	4.976	(0.886)	61682	20.0000	17.73
59	Chlorobenzene	112	8.264	8.264	(1.003)	165227	20.0000	20.21
7	Chloroethane	64	1.737	1.737	(0.356)	43002	20.0000	19.66(M)
28	Chloroform	83	4.643	4.643	(0.952)	107071	20.0000	21.03
3	Chloromethane	50	1.329	1.329	(0.272)	52032	20.0000	19.40
27	cis-1,2-Dichloroethene	96	4.268	4.268	(0.875)	66536	20.0000	20.60
46	cis-1,3-Dichloropropene	75	6.749	6.749	(1.202)	82868	20.0000	18.10
55	Dibromochloromethane	129	7.747	7.747	(0.940)	55171	20.0000	18.44
44	Dibromomethane	93	6.180	6.180	(1.101)	41095	20.0000	20.64
2	Dichlorodifluoromethane	85	1.190	1.190	(0.244)	63286	20.0000	19.63
61	Ethylbenzene	106	8.361	8.361	(1.015)	82503	20.0000	20.16
91	Hexachlorobutadiene	225	12.054	12.054	(1.179)	27398	20.0000	19.24
67	Isopropylbenzene	105	9.115	9.115	(1.106)	251092	20.0000	20.38
62	m,p-Xylenes	106	8.463	8.463	(1.027)	209942	40.0000	41.53
17	Methylene Chloride	84	2.855	2.855	(0.585)	60113	20.0000	19.29
87	n-Butylbenzene	91	10.547	10.547	(1.032)	184043	20.0000	20.12
73	n-Propylbenzene	91	9.467	9.467	(0.926)	292230	20.0000	20.55
92	Naphthalene	128	12.121	12.121	(1.186)	228366	20.0000	19.80
63	o-Xylene	106	8.800	8.800	(1.068)	102220	20.0000	20.41
81	sec-Butylbenzene	105	10.078	10.078	(0.986)	235156	20.0000	20.13
64	Styrene	104	8.815	8.815	(1.070)	182495	20.0000	21.22
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	176018	20.0000	20.29
56	Tetrachloroethene	164	7.514	7.514	(0.912)	46359	20.0000	19.60
50	Toluene	91	7.038	7.038	(0.854)	258382	20.0000	20.59
20	trans-1,2-Dichloroethene	96	3.121	3.121	(0.640)	53117	20.0000	19.98
51	trans-1,3-Dichloropropene	75	7.252	7.252	(1.292)	66354	20.0000	17.27
38	Trichloroethene	130	5.850	5.850	(1.042)	60190	20.0000	19.86
8	Trichlorofluoromethane	101	1.940	1.940	(0.398)	86234	20.0000	20.23
5	Vinyl Chloride	62	1.404	1.404	(0.288)	64078	20.0000	20.04

QC Flag Legend

M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

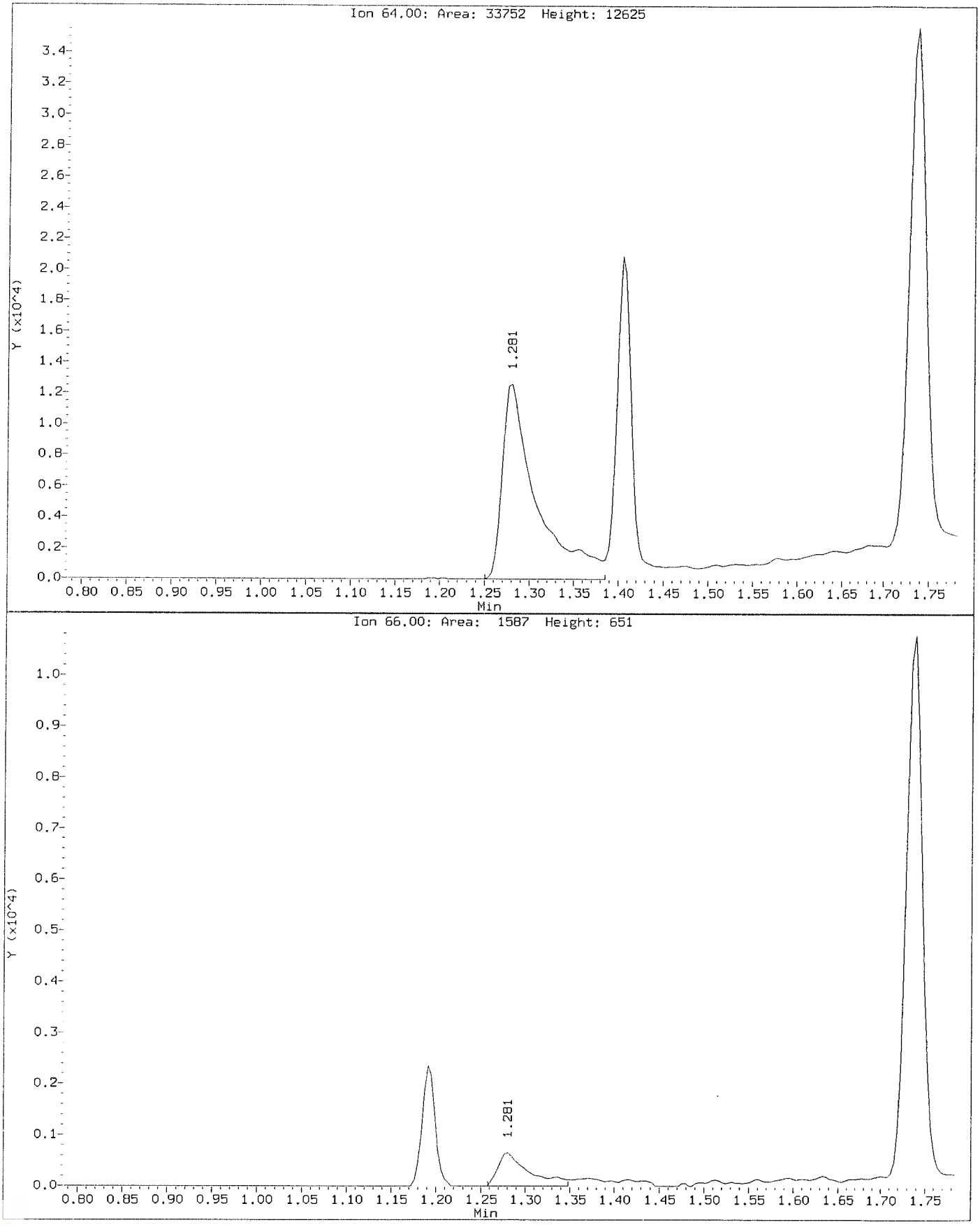


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Sample Info: VSTD020;VSTD020;1;6;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

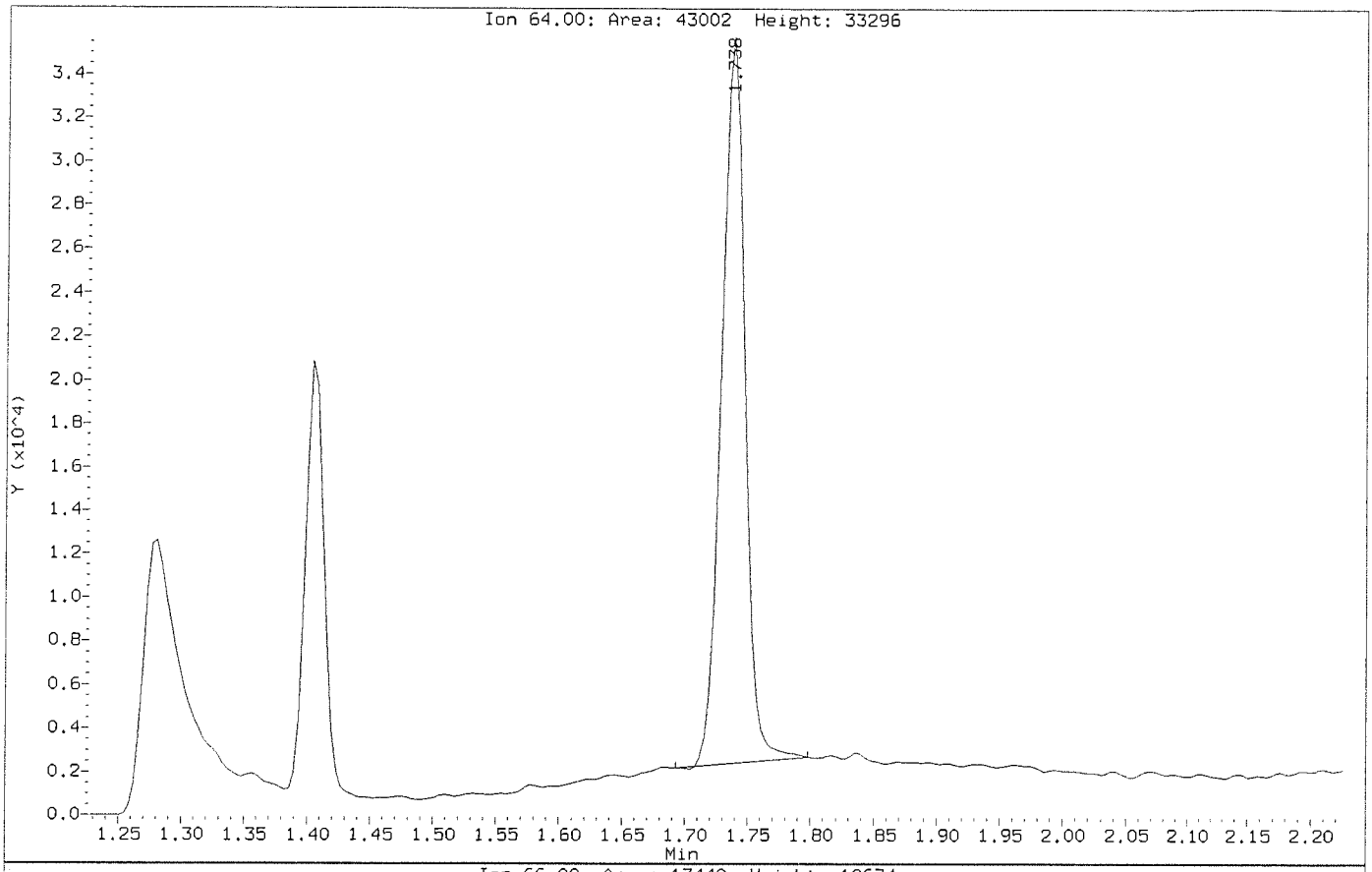
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Instrument: VOA9.i
Client Sample ID: VSTD020

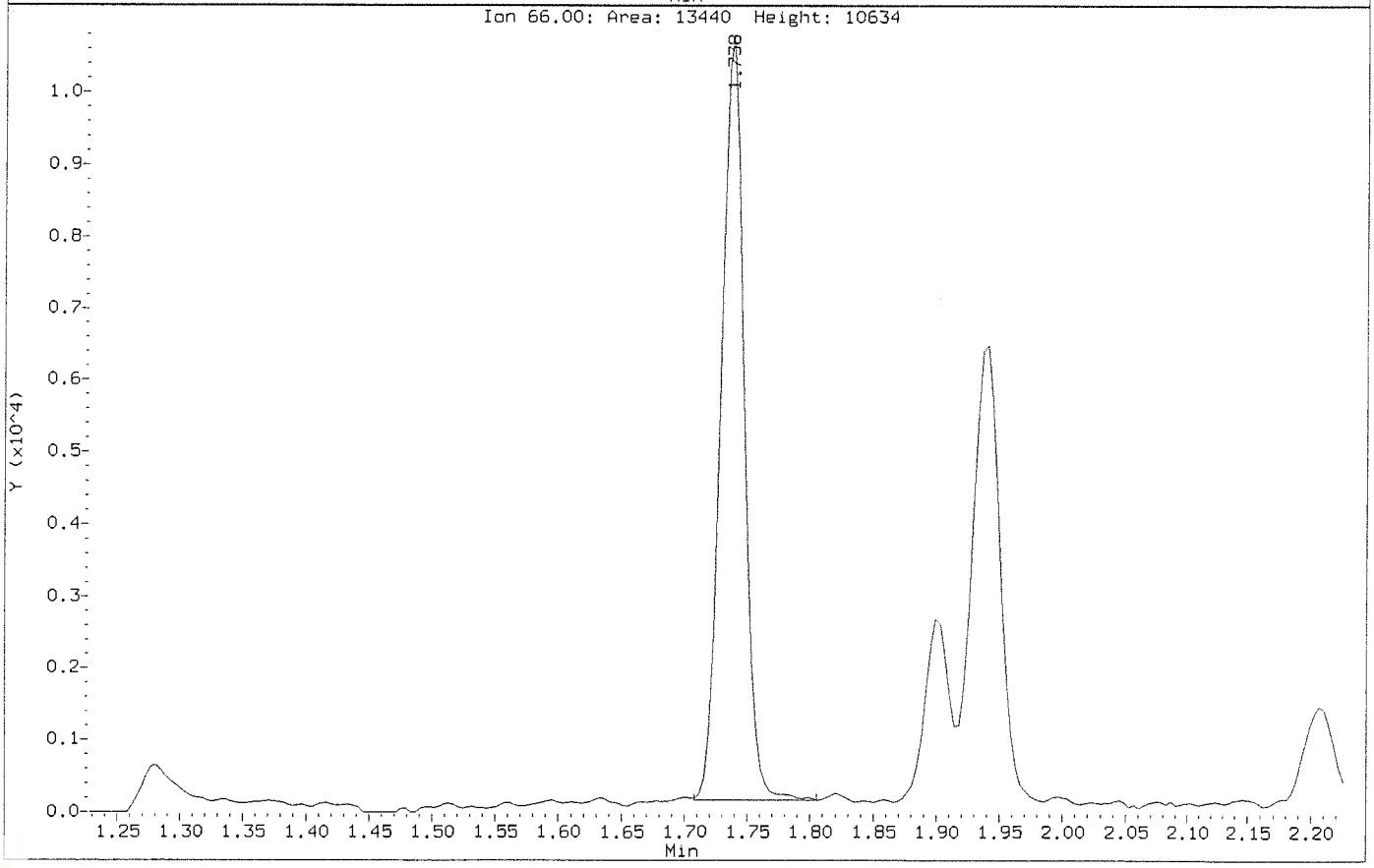
Compound: Chloroethane
CAS Number: 75-00-3



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111507.D
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Instrument: VOA9.i
Client Sample ID: VSTD020

Compound: Chloroethane
CAS Number: 75-00-3





Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111508.D Page 1
Report Date: 20-Dec-2021 15:39

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111508.D
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Cal Date : 15-NOV-2021 16:05 Cal File: U111507.D
Als bottle: 9 Calibration Sample, Level: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

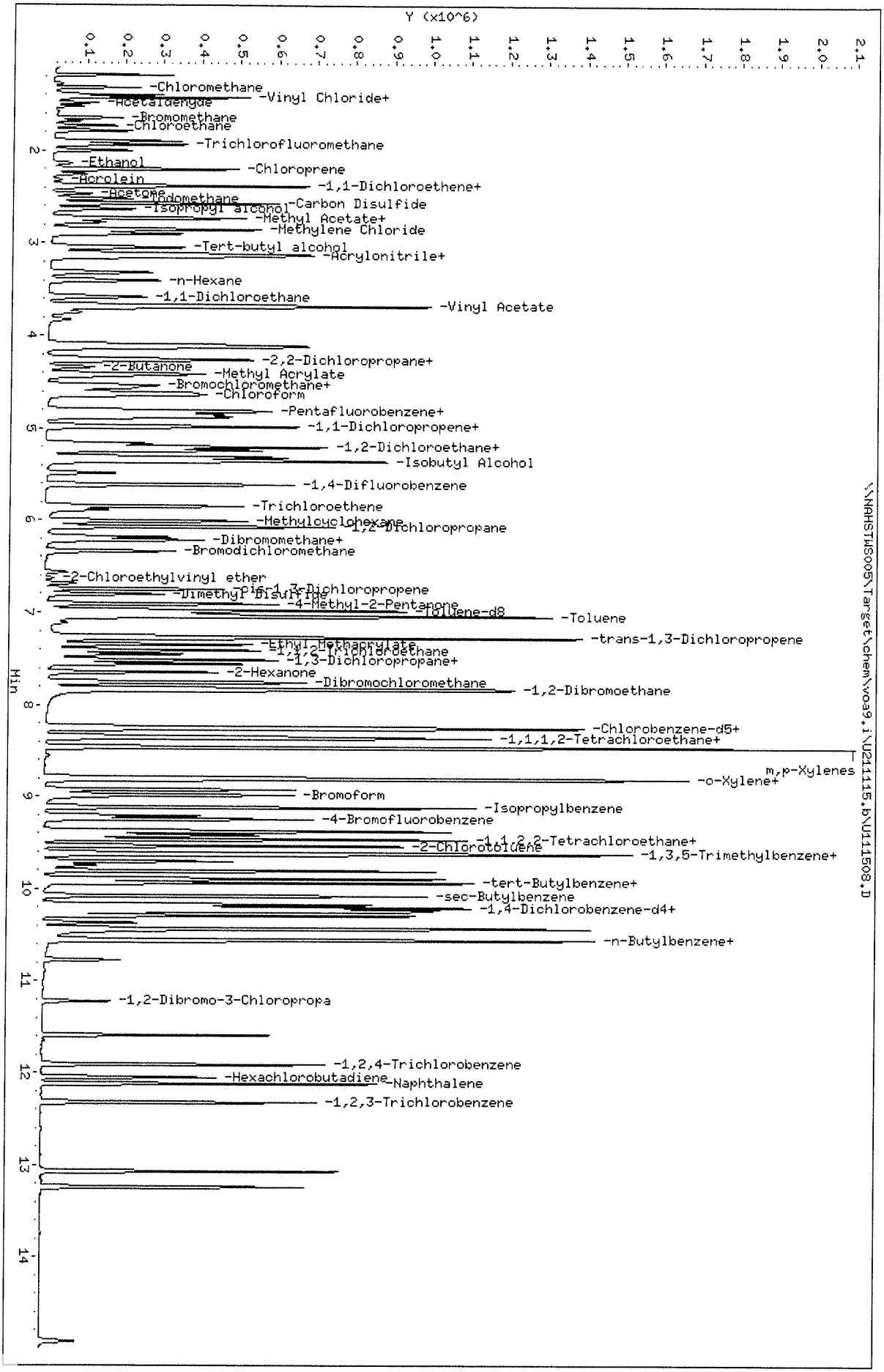
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.879	4.879	(1.000)	276380	50.0000	
*	36 1,4-Difluorobenzene	114	5.613	5.613	(1.000)	475930	50.0000	
*	47 Chlorobenzene-d5	117	8.241	8.241	(1.000)	429500	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.224	10.224	(1.000)	217147	50.0000	
$	30 Dibromofluoromethane	113	4.815	4.815	(0.987)	146958	50.0000	50.66
$	35 1,2-Dichloroethane-d4	65	5.164	5.164	(1.058)	174378	50.0000	51.47
$	48 Toluene-d8	98	6.978	6.978	(0.847)	546357	50.0000	48.87
$	69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	212217	50.0000	50.89
	60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	145929	50.0000	49.02
	31 1,1,1-Trichloroethane	97	4.807	4.807	(0.985)	216178	50.0000	54.33
	68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	232653	50.0000	50.90
	53 1,1,2-Trichloroethane	83	7.409	7.409	(0.899)	129181	50.0000	51.04
	22 1,1-Dichloroethane	63	3.582	3.582	(0.734)	248821	50.0000	50.67
	11 1,1-Dichloroethene	96	2.378	2.378	(0.488)	128120	50.0000	51.99
	32 1,1-Dichloropropene	75	4.984	4.984	(0.888)	205255	50.0000	52.51
	93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	197495	50.0000	50.78
	71 1,2,3-Trichloropropane	75	9.415	9.415	(0.921)	236775	50.0000	52.76
	90 1,2,4-Trichlorobenzene	180	11.911	11.911	(1.165)	206782	50.0000	51.73
	79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	575954	50.0000	52.90
	89 1,2-Dibromo-3-Chloropropane	155	11.221	11.221	(1.098)	34570	50.0000	45.93
	57 1,2-Dibromoethane	107	7.840	7.840	(0.951)	164064	50.0000	53.36
	88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	312765	50.0000	51.07

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111508.D Page 2
Report Date: 20-Dec-2021 15:39

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.238	5.238	(0.933)	215530	50.0000	50.20
42	1,2-Dichloropropane	63	6.071	6.071	(1.081)	153894	50.0000	51.38
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	552914	50.0000	51.78
83	1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	312442	50.0000	49.95
54	1,3-Dichloropropane	76	7.555	7.555	(0.917)	276461	50.0000	51.26
84	1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	324361	50.0000	50.40
26	2,2-Dichloropropane	77	4.253	4.253	(0.872)	146044	50.0000	52.48
24	2-Butanone	43	4.339	4.339	(0.889)	145658	100.000	100.78
76	2-Chlorotoluene	91	9.538	9.538	(0.933)	478010	50.0000	51.12
52	2-Hexanone	43	7.645	7.645	(0.928)	229120	100.000	112.37(H)
77	4-Chlorotoluene	91	9.632	9.632	(0.942)	554589	50.0000	51.17
82	p-Isopropyltoluene	119	10.202	10.202	(0.998)	565348	50.0000	53.42
45	4-Methyl-2-Pentanone	43	6.910	6.910	(0.839)	327903	100.000	106.00
10	Acetone	43	2.464	2.464	(0.505)	102765	100.000	106.98
37	Benzene	78	5.201	5.201	(0.927)	614439	50.0000	51.05
74	Bromobenzene	156	9.373	9.373	(0.917)	173629	50.0000	51.56
29	Bromochloromethane	128	4.537	4.537	(0.930)	81234	50.0000	52.10
39	Bromodichloromethane	83	6.337	6.337	(1.129)	187745	50.0000	48.50
66	Bromoform	173	8.972	8.972	(1.089)	96626	50.0000	47.90
6	Bromomethane	94	1.644	1.644	(0.337)	83889	50.0000	49.25
19	Carbon Disulfide	76	2.566	2.566	(0.526)	726090	100.000	106.16
34	Carbon Tetrachloride	117	4.976	4.976	(0.886)	182502	50.0000	48.29
59	Chlorobenzene	112	8.264	8.264	(1.003)	417893	50.0000	49.90
7	Chloroethane	64	1.730	1.730	(0.355)	110524	50.0000	48.32(M)
28	Chloroform	83	4.639	4.639	(0.951)	276051	50.0000	51.85
3	Chloromethane	50	1.321	1.321	(0.271)	145589	50.0000	52.90
27	cis-1,2-Dichloroethene	96	4.264	4.264	(0.874)	173599	50.0000	51.41
46	cis-1,3-Dichloropropene	75	6.749	6.749	(1.202)	238784	50.0000	47.68
55	Dibromochloromethane	129	7.746	7.746	(0.940)	155960	50.0000	48.26
44	Dibromomethane	93	6.179	6.179	(1.101)	103075	50.0000	50.46
2	Dichlorodifluoromethane	85	1.186	1.186	(0.243)	172970	50.0000	52.46
61	Ethylbenzene	106	8.361	8.361	(1.015)	218185	50.0000	52.06
91	Hexachlorobutadiene	225	12.054	12.054	(1.179)	78634	50.0000	53.23
67	Isopropylbenzene	105	9.115	9.115	(1.106)	666038	50.0000	52.78
62	m,p-Xylenes	106	8.462	8.462	(1.027)	543578	100.000	104.98
17	Methylene Chloride	84	2.847	2.847	(0.584)	151108	50.0000	46.39
87	n-Butylbenzene	91	10.547	10.547	(1.032)	501371	50.0000	52.84
73	n-Propylbenzene	91	9.467	9.467	(0.926)	766824	50.0000	51.99
92	Naphthalene	128	12.121	12.121	(1.186)	619173	50.0000	51.75
63	o-Xylene	106	8.800	8.800	(1.068)	268452	50.0000	52.34
81	sec-Butylbenzene	105	10.078	10.078	(0.986)	640176	50.0000	52.83
64	Styrene	104	8.815	8.815	(1.070)	476282	50.0000	54.08
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	467210	50.0000	51.91
56	Tetrachloroethene	164	7.510	7.510	(0.911)	121252	50.0000	50.05
50	Toluene	91	7.034	7.034	(0.854)	651446	50.0000	50.69
20	trans-1,2-Dichloroethene	96	3.117	3.117	(0.639)	141166	50.0000	50.78
51	trans-1,3-Dichloropropene	75	7.252	7.252	(1.292)	203307	50.0000	47.39
38	Trichloroethene	130	5.846	5.846	(1.041)	161654	50.0000	51.99
8	Trichlorofluoromethane	101	1.932	1.932	(0.396)	235822	50.0000	52.90
5	Vinyl Chloride	62	1.400	1.400	(0.287)	173173	50.0000	51.80

QC Flag Legend

M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

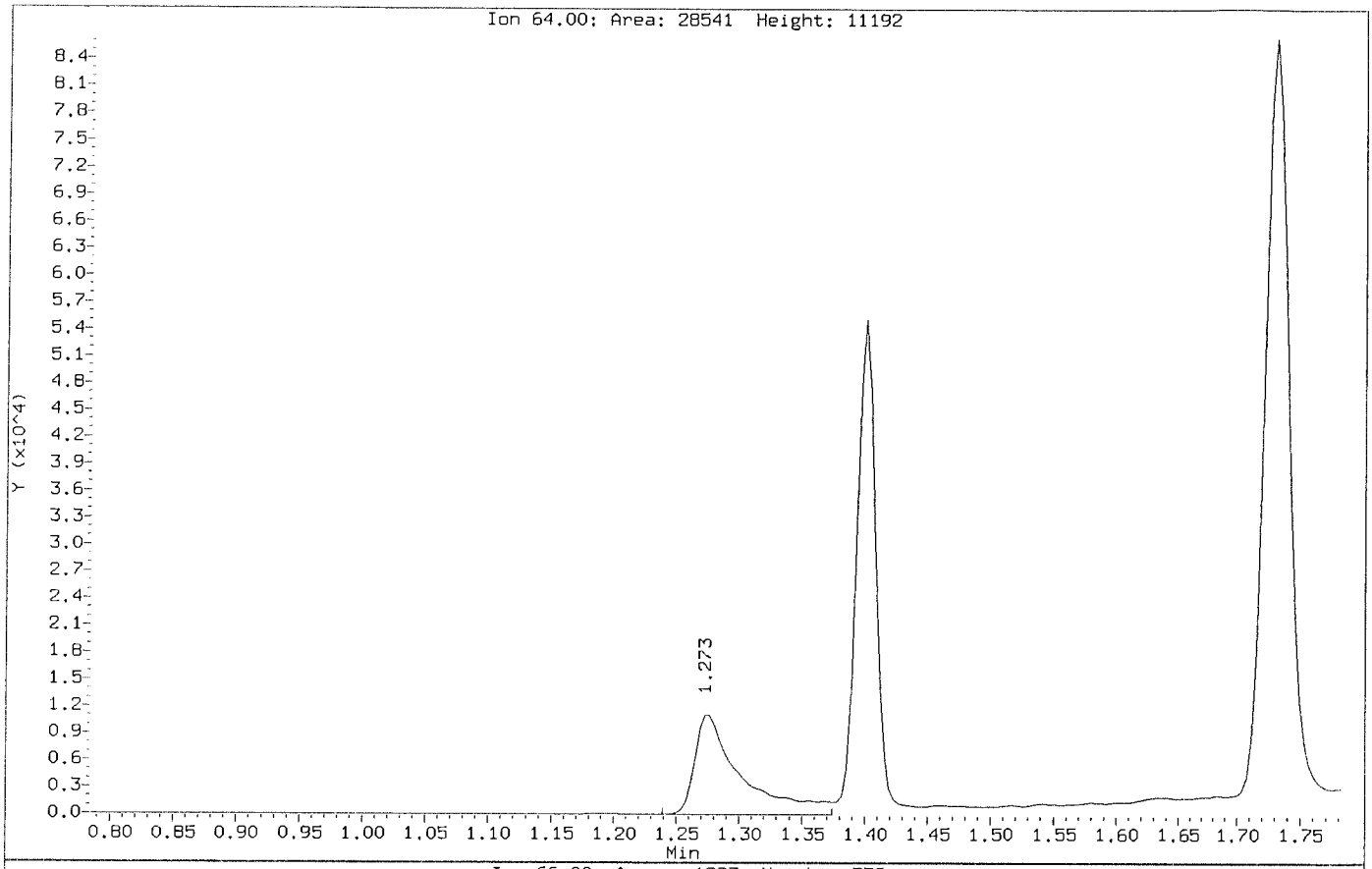


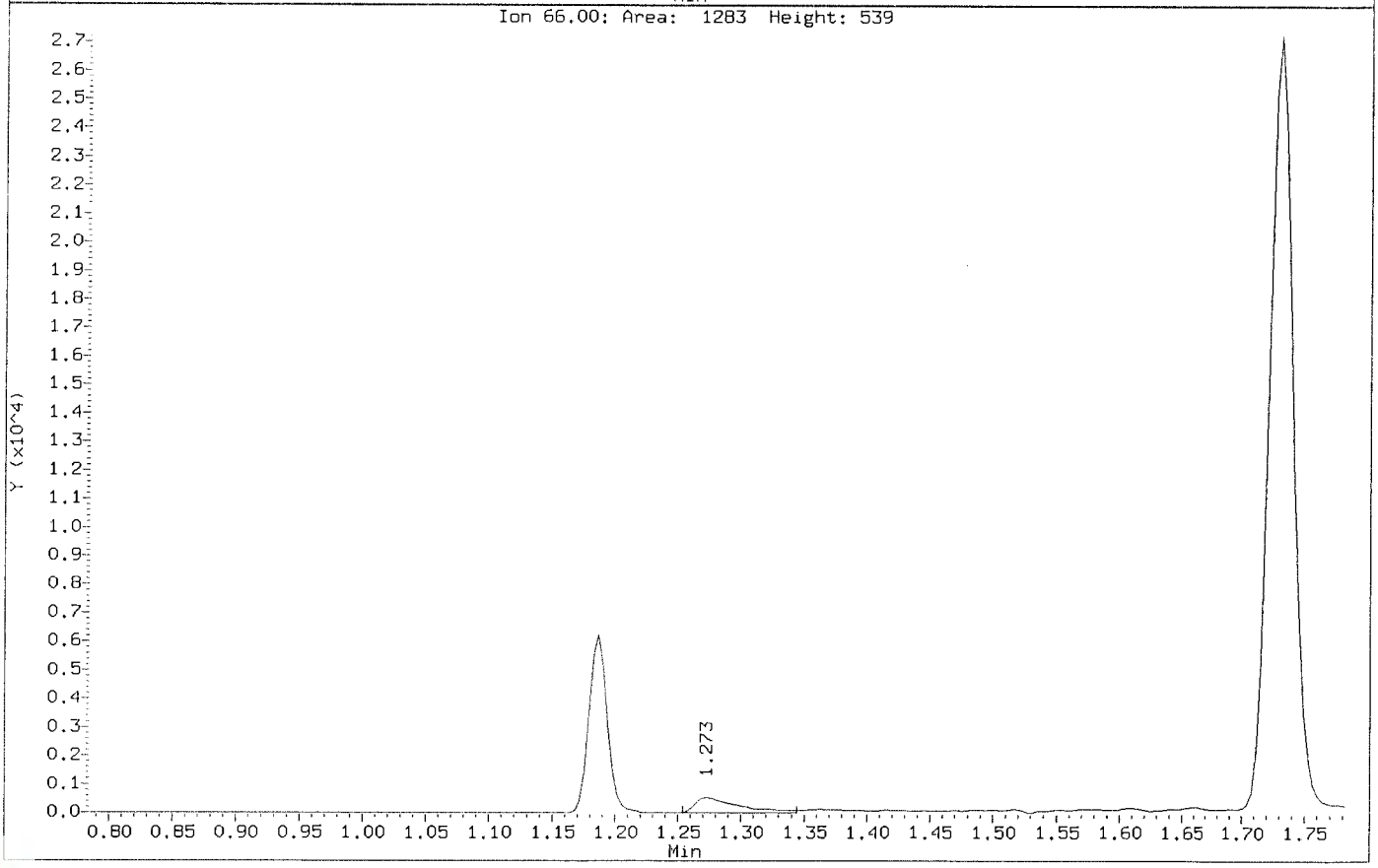
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Date : 15-NOV-2021 16:27
Client ID: VSTD050
Sample Info: VSTD050;VSTD050;1;7;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111508.D
Injection Date: 15-NOV-2021 16:27
Instrument: VOA9.i
Client Sample ID: VSTD050

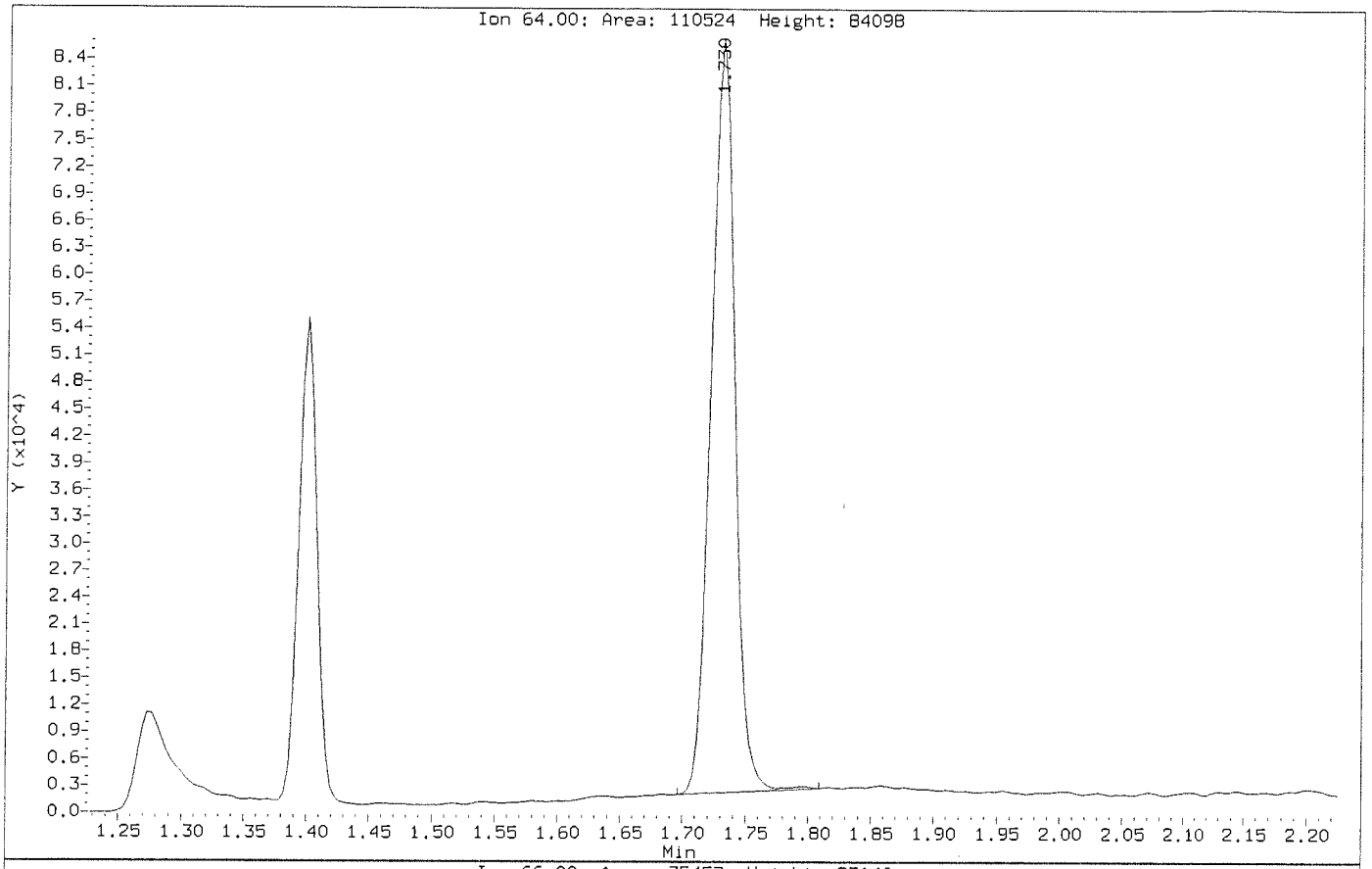
Compound: Chloroethane
CAS Number: 75-00-3

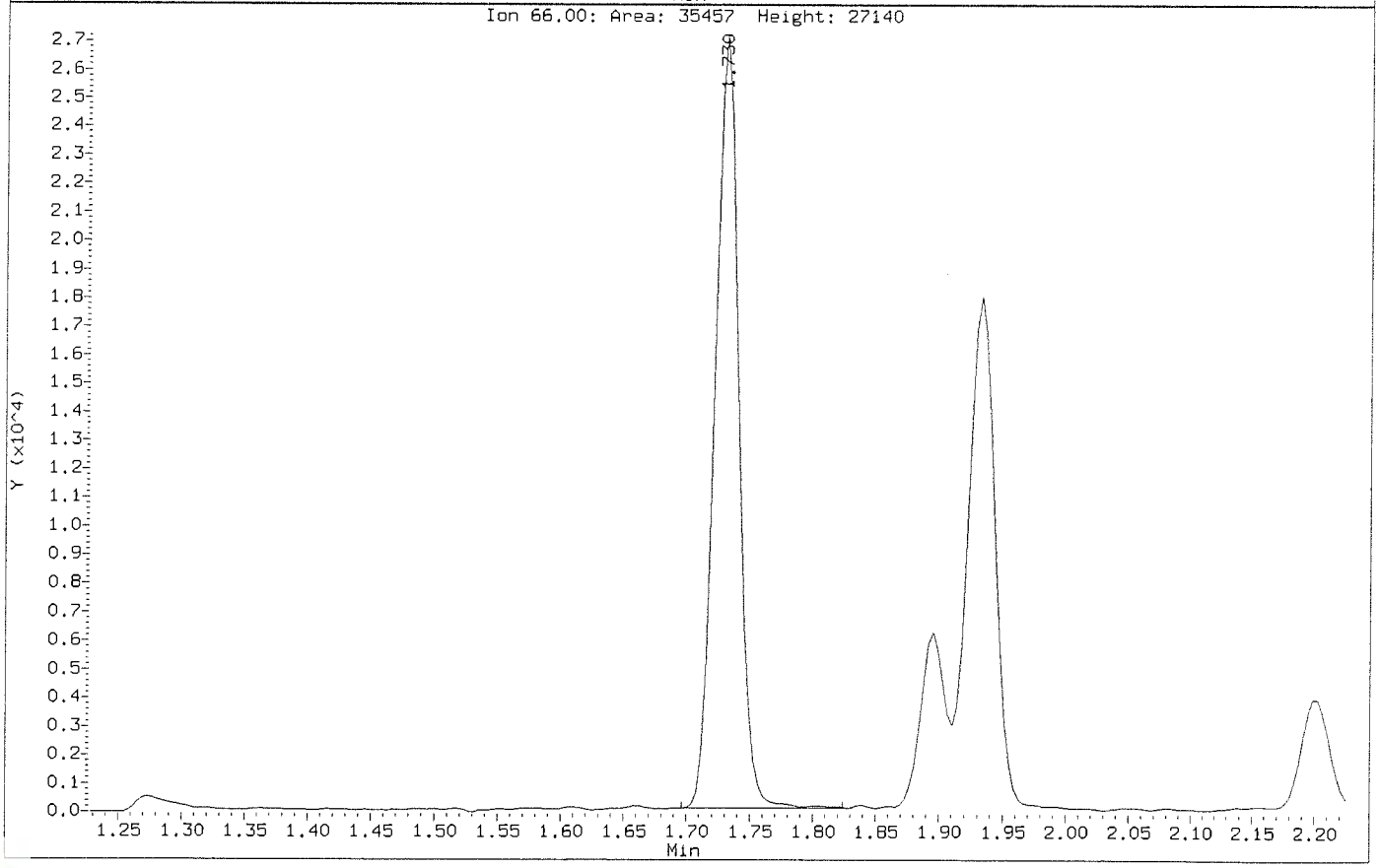




Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111508.D
Injection Date: 15-NOV-2021 16:27
Instrument: VOA9.i
Client Sample ID: VSTD050

Compound: Chloroethane
CAS Number: 75-00-3





ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111509.D
Lab Smp Id: VSTD100 Client Smp ID: VSTD100
Inj Date : 15-NOV-2021 16:49
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD100;VSTD100;1;8;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211115.b\8260C.m
Meth Date : 20-Dec-2021 15:39 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 10 Calibration Sample, Level: 8
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

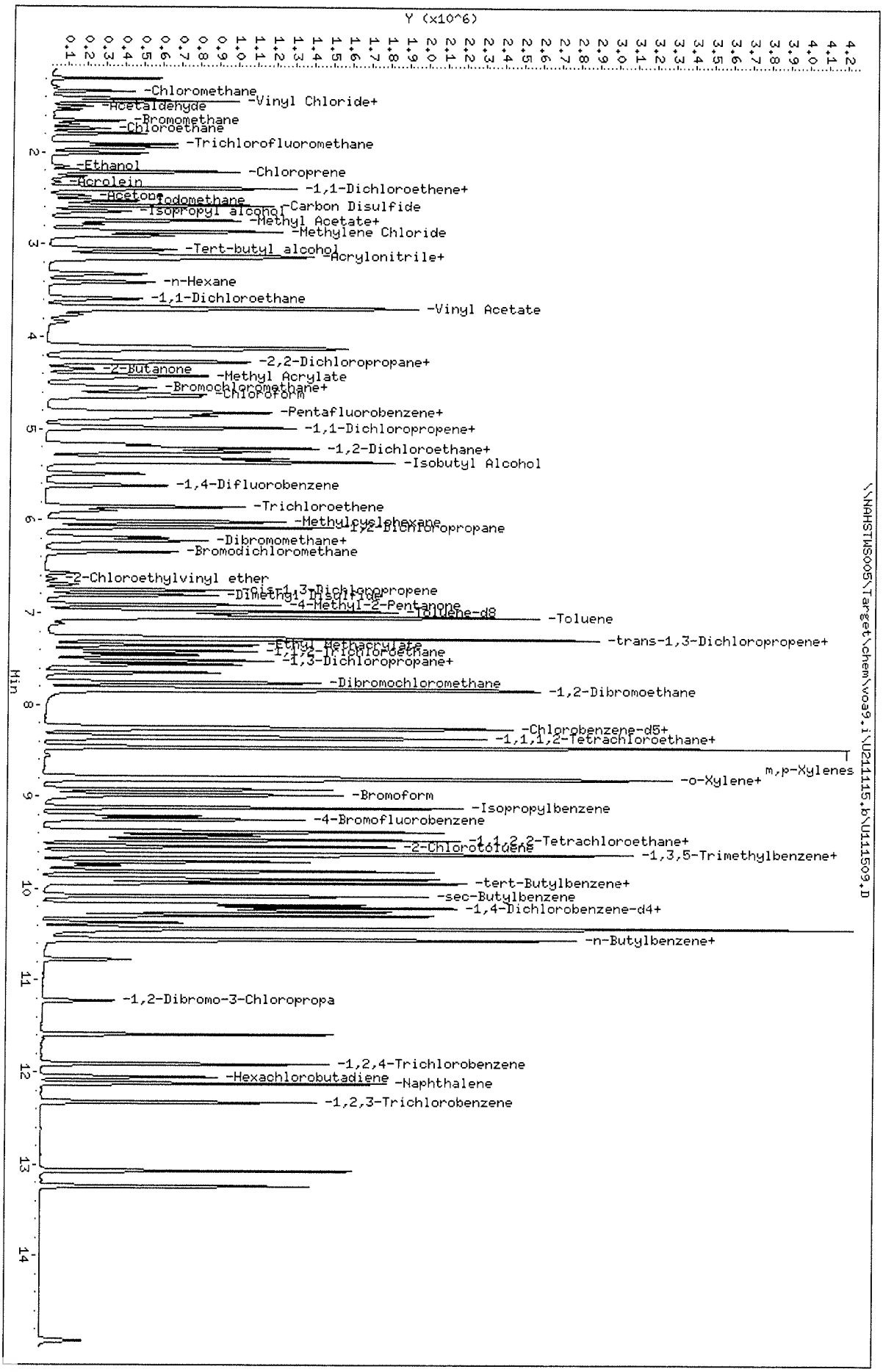
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.883	4.883	(1.000)	276955	50.0000	
*	36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	474551	50.0000	
*	47 Chlorobenzene-d5	117	8.241	8.241	(1.000)	433803	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.224	10.224	(1.000)	217322	50.0000	
$	30 Dibromofluoromethane	113	4.819	4.819	(0.987)	294099	100.000	102.04
$	35 1,2-Dichloroethane-d4	65	5.167	5.167	(1.058)	347770	100.000	103.92
$	48 Toluene-d8	98	6.978	6.978	(0.847)	1088412	100.000	96.40
$	69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	425707	100.000	102.40
	60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	305424	100.000	100.70
	31 1,1,1-Trichloroethane	97	4.811	4.811	(0.985)	448245	100.000	112.43
	68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	465345	100.000	101.73
	53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	259942	100.000	101.69
	22 1,1-Dichloroethane	63	3.589	3.589	(0.735)	487188	100.000	99.01
	11 1,1-Dichloroethene	96	2.386	2.386	(0.489)	252111	100.000	102.10
	32 1,1-Dichloropropene	75	4.991	4.991	(0.889)	404548	100.000	103.81
	93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	401804	100.000	103.24
	71 1,2,3-Trichloropropane	75	9.418	9.418	(0.921)	493615	100.000	109.90
	90 1,2,4-Trichlorobenzene	180	11.911	11.911	(1.165)	420010	100.000	105.00
	79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	1141292	100.000	104.75
	89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	77043	100.000	99.30
	57 1,2-Dibromoethane	107	7.840	7.840	(0.951)	332327	100.000	107.02
	88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	620557	100.000	101.25

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111509.D Page 2
Report Date: 20-Dec-2021 15:39

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.242	5.242	(0.934)	431283	100.000	100.74
42	1,2-Dichloropropane	63	6.071	6.071	(1.081)	308280	100.000	103.23
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	1105545	100.000	103.46
83	1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	623472	100.000	99.60
54	1,3-Dichloropropane	76	7.555	7.555	(0.917)	554036	100.000	101.71
84	1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	649602	100.000	100.86
26	2,2-Dichloropropane	77	4.260	4.260	(0.873)	310140	100.000	111.21
24	2-Butanone	43	4.346	4.346	(0.890)	294665	200.000	203.46(A)
76	2-Chlorotoluene	91	9.538	9.538	(0.933)	950588	100.000	101.57
52	2-Hexanone	43	7.274	7.274	(0.883)	422256	200.000	205.05(A)
77	4-Chlorotoluene	91	9.628	9.628	(0.942)	1112395	100.000	102.57
82	p-Isopropyltoluene	119	10.202	10.202	(0.998)	1145933	100.000	108.20
45	4-Methyl-2-Pentanone	43	6.911	6.911	(0.839)	662320	200.000	211.99(A)
10	Acetone	43	2.472	2.472	(0.506)	199248	200.000	213.20(A)
37	Benzene	78	5.205	5.205	(0.927)	1218325	100.000	101.53
74	Bromobenzene	156	9.373	9.373	(0.917)	352762	100.000	104.67
29	Bromochloromethane	128	4.541	4.541	(0.930)	158137	100.000	101.22
39	Bromodichloromethane	83	6.341	6.341	(1.130)	392803	100.000	100.64
66	Bromoform	173	8.976	8.976	(1.089)	216725	100.000	101.79
6	Bromomethane	94	1.651	1.651	(0.338)	170081	100.000	100.17
19	Carbon Disulfide	76	2.577	2.577	(0.528)	1439204	200.000	210.00(A)
34	Carbon Tetrachloride	117	4.980	4.980	(0.887)	382517	100.000	99.86
59	Chlorobenzene	112	8.264	8.264	(1.003)	839635	100.000	99.28
7	Chloroethane	64	1.737	1.737	(0.356)	222198	100.000	96.95
28	Chloroform	83	4.646	4.646	(0.952)	549897	100.000	103.07
3	Chloromethane	50	1.333	1.333	(0.273)	274951	100.000	100.21
27	cis-1,2-Dichloroethene	96	4.272	4.272	(0.875)	341672	100.000	100.97
46	cis-1,3-Dichloropropene	75	6.749	6.749	(1.202)	512945	100.000	100.71
55	Dibromochloromethane	129	7.750	7.750	(0.940)	334001	100.000	100.65
44	Dibromomethane	93	6.180	6.180	(1.101)	208170	100.000	102.21
2	Dichlorodifluoromethane	85	1.194	1.194	(0.245)	337382	100.000	102.80
61	Ethylbenzene	106	8.361	8.361	(1.015)	434998	100.000	102.77
91	Hexachlorobutadiene	225	12.054	12.054	(1.179)	165847	100.000	112.18
67	Isopropylbenzene	105	9.119	9.119	(1.106)	1327982	100.000	104.20
62	m,p-Xylenes	106	8.463	8.463	(1.027)	1092288	200.000	208.86(A)
17	Methylene Chloride	84	2.858	2.858	(0.585)	297977	100.000	91.29
87	n-Butylbenzene	91	10.547	10.547	(1.032)	1006428	100.000	105.98
73	n-Propylbenzene	91	9.467	9.467	(0.926)	1535160	100.000	104.00
92	Naphthalene	128	12.121	12.121	(1.186)	1265419	100.000	105.68
63	o-Xylene	106	8.800	8.800	(1.068)	531572	100.000	102.62
81	sec-Butylbenzene	105	10.078	10.078	(0.986)	1285548	100.000	106.00
64	Styrene	104	8.815	8.815	(1.070)	954419	100.000	107.30
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	938646	100.000	104.21
56	Tetrachloroethene	164	7.514	7.514	(0.912)	241581	100.000	98.74
50	Toluene	91	7.038	7.038	(0.854)	1292303	100.000	99.57
20	trans-1,2-Dichloroethene	96	3.124	3.124	(0.640)	274819	100.000	98.66
51	trans-1,3-Dichloropropene	75	7.252	7.252	(1.292)	440168	100.000	100.43
38	Trichloroethene	130	5.850	5.850	(1.042)	320726	100.000	103.45
8	Trichlorofluoromethane	101	1.940	1.940	(0.397)	459124	100.000	102.79
5	Vinyl Chloride	62	1.411	1.411	(0.289)	341984	100.000	102.09

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111509.D
Date : 15-NOV-2021 16:49
Client ID: VSTD100
Sample Info: VSTD100;VSTD100;1;8;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111510.D Page 1
Report Date: 20-Dec-2021 15:39

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111510.D
Lab Smp Id: VSTD150 Client Smp ID: VSTD150
Inj Date : 15-NOV-2021 17:11
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD150;VSTD150;1;9;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211115.b\8260C.m
Meth Date : 20-Dec-2021 15:39 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 16:49 Cal File: U111509.D
Als bottle: 11 Calibration Sample, Level: 9
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

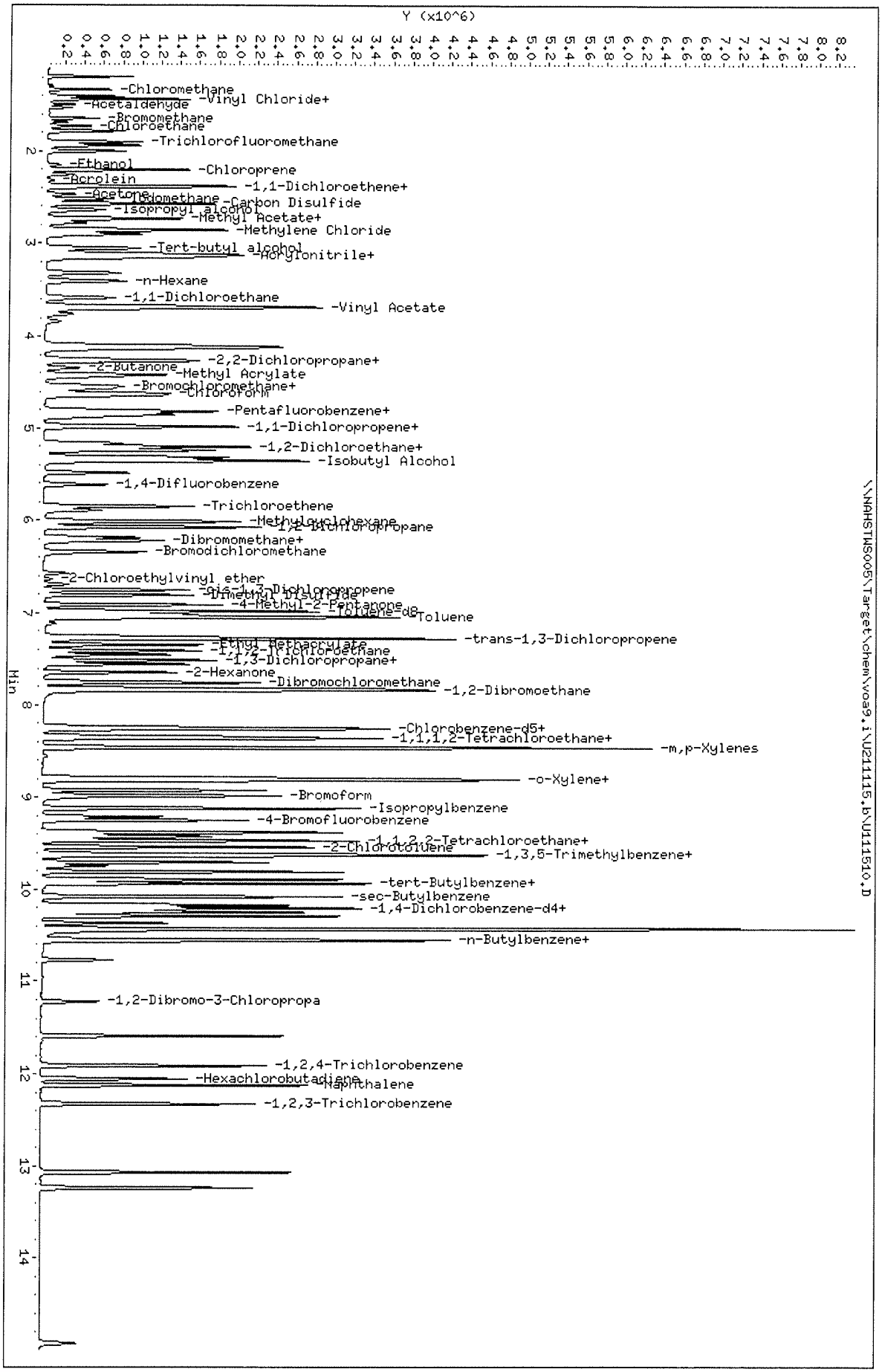
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.879	4.879	(1.000)	287432	50.0000	
*	36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	488809	50.0000	
*	47 Chlorobenzene-d5	117	8.242	8.242	(1.000)	448388	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	223026	50.0000	
$	30 Dibromofluoromethane	113	4.815	4.815	(0.987)	451793	150.000	151.46
$	35 1,2-Dichloroethane-d4	65	5.164	5.164	(1.058)	519537	150.000	150.25
$	48 Toluene-d8	98	6.978	6.978	(0.847)	1655087	150.000	141.82
$	69 4-Bromofluorobenzene	95	9.250	9.250	(1.122)	646932	150.000	151.19
	60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	468015	150.000	148.90
	31 1,1,1-Trichloroethane	97	4.811	4.811	(0.986)	684856	150.000	165.51
	68 1,1,2,2-Tetrachloroethane	83	9.385	9.385	(0.918)	690970	150.000	147.19
	53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	380690	150.000	144.08
	22 1,1-Dichloroethane	63	3.586	3.586	(0.735)	719035	150.000	140.80
	11 1,1-Dichloroethene	96	2.382	2.382	(0.488)	376843	150.000	147.05
	32 1,1-Dichloropropene	75	4.988	4.988	(0.888)	611762	150.000	152.40
	93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	625529	150.000	156.61
	71 1,2,3-Trichloropropane	75	9.419	9.419	(0.921)	764142	150.000	165.79
	90 1,2,4-Trichlorobenzene	180	11.911	11.911	(1.165)	647828	150.000	157.81
	79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	1716802	150.000	153.54
	89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	120988	150.000	150.67
	57 1,2-Dibromoethane	107	7.840	7.840	(0.951)	493996	150.000	153.91
	88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	931353	150.000	148.08

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111510.D Page 2
Report Date: 20-Dec-2021 15:39

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33 1,2-Dichloroethane	62	5.243	5.243	(0.934)	635572	150.000	144.13
42 1,2-Dichloropropane	63	6.071	6.071	(1.081)	458917	150.000	149.20
75 1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	1672188	150.000	152.49
83 1,3-Dichlorobenzene	146	10.172	10.172	(0.995)	954409	150.000	148.58
54 1,3-Dichloropropane	76	7.556	7.556	(0.917)	818561	150.000	145.39
84 1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	973989	150.000	147.36
26 2,2-Dichloropropane	77	4.257	4.257	(0.872)	486198	150.000	167.99
24 2-Butanone	43	4.343	4.343	(0.890)	433312	300.000	288.30(A)
76 2-Chlorotoluene	91	9.539	9.539	(0.933)	1428226	150.000	148.71
52 2-Hexanone	43	7.645	7.645	(0.928)	695436	300.000	326.72(AH)
77 4-Chlorotoluene	91	9.632	9.632	(0.942)	1660020	150.000	149.15
82 p-Isopropyltoluene	119	10.202	10.202	(0.998)	1733366	150.000	159.48
45 4-Methyl-2-Pentanone	43	6.911	6.911	(0.839)	985556	300.000	305.19(A)
10 Acetone	43	2.469	2.469	(0.506)	287306	300.000	298.80(A)
37 Benzene	78	5.205	5.205	(0.927)	1815130	150.000	146.85
74 Bromobenzene	156	9.374	9.374	(0.917)	533195	150.000	154.16
29 Bromochloromethane	128	4.542	4.542	(0.931)	233535	150.000	144.04
39 Bromodichloromethane	83	6.337	6.337	(1.129)	600907	150.000	148.96
66 Bromoform	173	8.976	8.976	(1.089)	341423	150.000	150.26
6 Bromomethane	94	1.644	1.644	(0.337)	215171	150.000	122.22
19 Carbon Disulfide	76	2.570	2.570	(0.527)	2162433	300.000	304.03(A)
34 Carbon Tetrachloride	117	4.976	4.976	(0.886)	595268	150.000	150.10
59 Chlorobenzene	112	8.264	8.264	(1.003)	1261119	150.000	144.27
7 Chloroethane	64	1.730	1.730	(0.355)	337912	150.000	142.07
28 Chloroform	83	4.643	4.643	(0.952)	820803	150.000	148.25
3 Chloromethane	50	1.329	1.329	(0.272)	431092	150.000	151.70
27 cis-1,2-Dichloroethene	96	4.268	4.268	(0.875)	510106	150.000	145.25
46 cis-1,3-Dichloropropene	75	6.750	6.750	(1.202)	784849	150.000	148.76
55 Dibromochloromethane	129	7.750	7.750	(0.940)	509745	150.000	147.90
44 Dibromomethane	93	6.180	6.180	(1.101)	311006	150.000	148.25
2 Dichlorodifluoromethane	85	1.190	1.190	(0.244)	508351	150.000	149.57
61 Ethylbenzene	106	8.361	8.361	(1.015)	661822	150.000	151.27
91 Hexachlorobutadiene	225	12.054	12.054	(1.179)	263784	150.000	173.86
67 Isopropylbenzene	105	9.119	9.119	(1.106)	2002397	150.000	152.00
62 m,p-Xylenes	106	8.463	8.463	(1.027)	1637388	300.000	302.91(A)
17 Methylene Chloride	84	2.851	2.851	(0.584)	437879	150.000	129.27
87 n-Butylbenzene	91	10.547	10.547	(1.032)	1511185	150.000	155.07
73 n-Propylbenzene	91	9.467	9.467	(0.926)	2317098	150.000	152.96
92 Naphthalene	128	12.121	12.121	(1.186)	1938991	150.000	157.79
63 o-Xylene	106	8.800	8.800	(1.068)	801718	150.000	149.74
81 sec-Butylbenzene	105	10.078	10.078	(0.986)	1960196	150.000	157.50
64 Styrene	104	8.815	8.815	(1.070)	1424573	150.000	154.95
78 tert-Butylbenzene	119	9.891	9.891	(0.967)	1423086	150.000	153.96
56 Tetrachloroethene	164	7.514	7.514	(0.912)	368036	150.000	145.53
50 Toluene	91	7.038	7.038	(0.854)	1931747	150.000	144.00
20 trans-1,2-Dichloroethene	96	3.121	3.121	(0.640)	410390	150.000	141.96
51 trans-1,3-Dichloropropene	75	7.252	7.252	(1.292)	679057	150.000	149.36
38 Trichloroethene	130	5.850	5.850	(1.042)	484476	150.000	151.71
8 Trichlorofluoromethane	101	1.936	1.936	(0.397)	686186	150.000	148.03
5 Vinyl Chloride	62	1.404	1.404	(0.288)	510132	150.000	146.74

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.
H - Operator selected an alternate compound hit.



Data File: \\NAHSTWS005\Target\chem\voa9,i\U211115,b\U111510,D
Date : 15-NOV-2021 17:11
Client ID: WSTD150
Sample Info: WSTD150;WSTD150;1;9;;
Purge Volume: 5.0
Column phase: DB624

\\NAHSTWS005\Target\chem\voa9,i\U211115,b\U111510,D

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111511.D Page 1
Report Date: 20-Dec-2021 15:39

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111511.D
Lab Smp Id: VSTD200 Client Smp ID: VSTD200
Inj Date : 15-NOV-2021 17:34
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD200;VSTD200;1;10;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211115.b\8260C.m
Meth Date : 20-Dec-2021 15:39 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 17:11 Cal File: U111510.D
Als bottle: 12 Calibration Sample, Level: 10
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

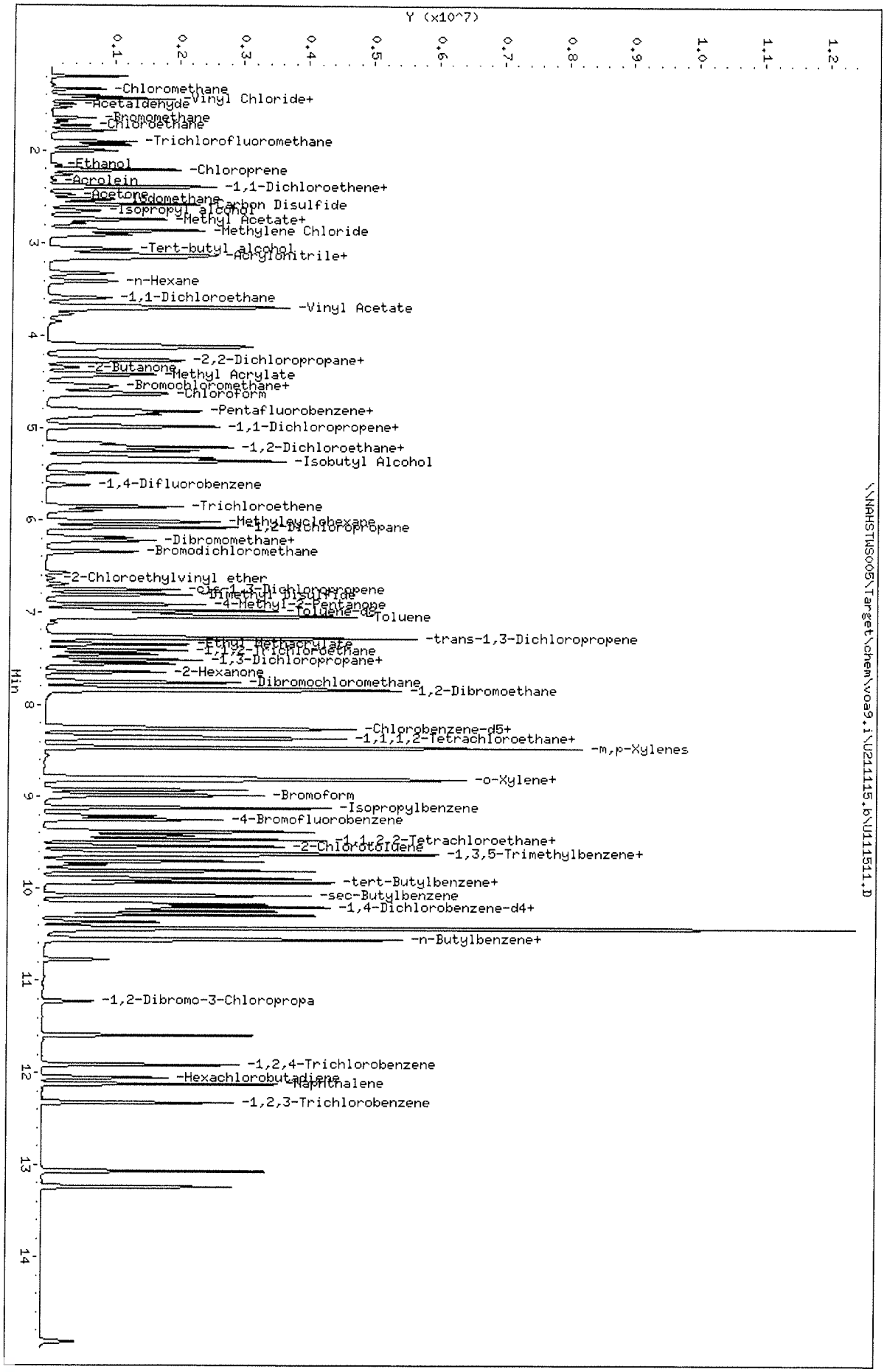
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.883	4.883	(1.000)	285252	50.0000	
* 36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	490029	50.0000	
* 47 Chlorobenzene-d5	117	8.242	8.242	(1.000)	448063	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	225618	50.0000	
$ 30 Dibromofluoromethane	113	4.819	4.819	(0.987)	584069	200.000	197.56
$ 35 1,2-Dichloroethane-d4	65	5.168	5.168	(1.058)	675186	200.000	197.22
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	2114876	200.000	181.35
$ 69 4-Bromofluorobenzene	95	9.250	9.250	(1.122)	842976	200.000	197.56
60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	631462	200.000	200.75(A)
31 1,1,1-Trichloroethane	97	4.812	4.812	(0.985)	923358	200.000	224.86(A)
68 1,1,2,2-Tetrachloroethane	83	9.385	9.385	(0.918)	911732	200.000	191.99
53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	511919	200.000	193.89
22 1,1-Dichloroethane	63	3.586	3.586	(0.734)	953825	200.000	188.21
11 1,1-Dichloroethene	96	2.386	2.386	(0.489)	498067	200.000	195.84
32 1,1-Dichloropropene	75	4.988	4.988	(0.888)	805619	200.000	200.20(A)
93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	836695	200.000	207.08(A)
71 1,2,3-Trichloropropane	75	9.419	9.419	(0.921)	1019741	200.000	218.70(A)
90 1,2,4-Trichlorobenzene	180	11.912	11.912	(1.165)	869474	200.000	209.37(A)
79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	2267562	200.000	200.47(A)
89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	163858	200.000	200.89(A)
57 1,2-Dibromoethane	107	7.844	7.844	(0.952)	653050	200.000	203.61(A)
88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	1244446	200.000	195.59

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111511.D Page 2
Report Date: 20-Dec-2021 15:39

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.243	5.243	(0.934)	840563	200.000	190.14
42	1,2-Dichloropropane	63	6.071	6.071	(1.081)	611859	200.000	198.43
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	2209947	200.000	199.22
83	1,3-Dichlorobenzene	146	10.172	10.172	(0.995)	1276700	200.000	196.47
54	1,3-Dichloropropane	76	7.556	7.556	(0.917)	1084428	200.000	192.75
84	1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	1312117	200.000	196.23
26	2,2-Dichloropropane	77	4.257	4.257	(0.872)	661532	200.000	230.33(A)
24	2-Butanone	43	4.347	4.347	(0.890)	567478	400.000	380.45(A)
76	2-Chlorotoluene	91	9.539	9.539	(0.933)	1904334	200.000	196.01
52	2-Hexanone	43	7.649	7.649	(0.928)	909144	400.000	427.43(AH)
77	4-Chlorotoluene	91	9.632	9.632	(0.942)	2211302	200.000	196.40
82	p-Isopropyltoluene	119	10.202	10.202	(0.998)	2280793	200.000	207.44(A)
45	4-Methyl-2-Pentanone	43	6.915	6.915	(0.839)	1295771	400.000	401.55(A)
10	Acetone	43	2.472	2.472	(0.506)	371722	400.000	391.57(A)
37	Benzene	78	5.205	5.205	(0.927)	2409160	200.000	194.43
74	Bromobenzene	156	9.374	9.374	(0.917)	714850	200.000	204.31(A)
29	Bromochloromethane	128	4.542	4.542	(0.930)	308852	200.000	191.95
39	Bromodichloromethane	83	6.337	6.337	(1.129)	813877	200.000	200.89(A)
66	Bromoform	173	8.976	8.976	(1.089)	468271	200.000	199.55
6	Bromomethane	94	1.644	1.644	(0.337)	270719	200.000	155.08
19	Carbon Disulfide	76	2.574	2.574	(0.527)	2848696	400.000	403.57(A)
34	Carbon Tetrachloride	117	4.980	4.980	(0.887)	799370	200.000	200.55(A)
59	Chlorobenzene	112	8.268	8.268	(1.003)	1683826	200.000	192.76
7	Chloroethane	64	1.726	1.726	(0.354)	426580	200.000	180.72
28	Chloroform	83	4.647	4.647	(0.952)	1093898	200.000	199.08
3	Chloromethane	50	1.329	1.329	(0.272)	557544	200.000	197.88
27	cis-1,2-Dichloroethene	96	4.272	4.272	(0.875)	684672	200.000	196.45
46	cis-1,3-Dichloropropene	75	6.750	6.750	(1.202)	1067583	200.000	201.23(A)
55	Dibromochloromethane	129	7.750	7.750	(0.940)	696655	200.000	201.73(A)
44	Dibromomethane	93	6.184	6.184	(1.101)	415970	200.000	197.79
2	Dichlorodifluoromethane	85	1.194	1.194	(0.245)	667949	200.000	198.26
61	Ethylbenzene	106	8.362	8.362	(1.015)	875310	200.000	200.22(A)
91	Hexachlorobutadiene	225	12.054	12.054	(1.179)	346631	200.000	225.84(A)
67	Isopropylbenzene	105	9.119	9.119	(1.106)	2674363	200.000	203.16(A)
62	m,p-Xylenes	106	8.463	8.463	(1.027)	2180098	400.000	403.60(A)
17	Methylene Chloride	84	2.855	2.855	(0.585)	578716	200.000	172.15
87	n-Butylbenzene	91	10.547	10.547	(1.032)	1974686	200.000	200.30(A)
73	n-Propylbenzene	91	9.467	9.467	(0.926)	3047395	200.000	198.86
92	Naphthalene	128	12.121	12.121	(1.186)	2562320	200.000	206.12(A)
63	o-Xylene	106	8.804	8.804	(1.068)	1072334	200.000	200.43(A)
81	sec-Butylbenzene	105	10.078	10.078	(0.986)	2570698	200.000	204.18(A)
64	Styrene	104	8.815	8.815	(1.070)	1898305	200.000	206.63(A)
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	1889047	200.000	202.02(A)
56	Tetrachloroethene	164	7.514	7.514	(0.912)	491043	200.000	194.32
50	Toluene	91	7.038	7.038	(0.854)	2555981	200.000	190.68
20	trans-1,2-Dichloroethene	96	3.125	3.125	(0.640)	548207	200.000	191.08
51	trans-1,3-Dichloropropene	75	7.252	7.252	(1.292)	919660	200.000	201.04(A)
38	Trichloroethene	130	5.850	5.850	(1.042)	651192	200.000	203.41(A)
8	Trichlorofluoromethane	101	1.936	1.936	(0.397)	910358	200.000	197.89
5	Vinyl Chloride	62	1.408	1.408	(0.288)	672430	200.000	194.91

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.
H - Operator selected an alternate compound hit.



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111511.D
Date : 15-NOV-2021 17:34
Client ID: VSTD200
Sample Info: VSTD200;VSTD200;1;10;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111513.D Page 1
Report Date: 20-Dec-2021 15:39

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111513.D
Lab Smp Id: ICV Client Smp ID: ICV
Inj Date : 15-NOV-2021 18:18
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD050;VSTD050;2;;;ICV
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211115.b\8260C.m
Meth Date : 20-Dec-2021 15:39 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 17:34 Cal File: U111511.D
Als bottle: 14 QC Sample: METHSPIKE
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

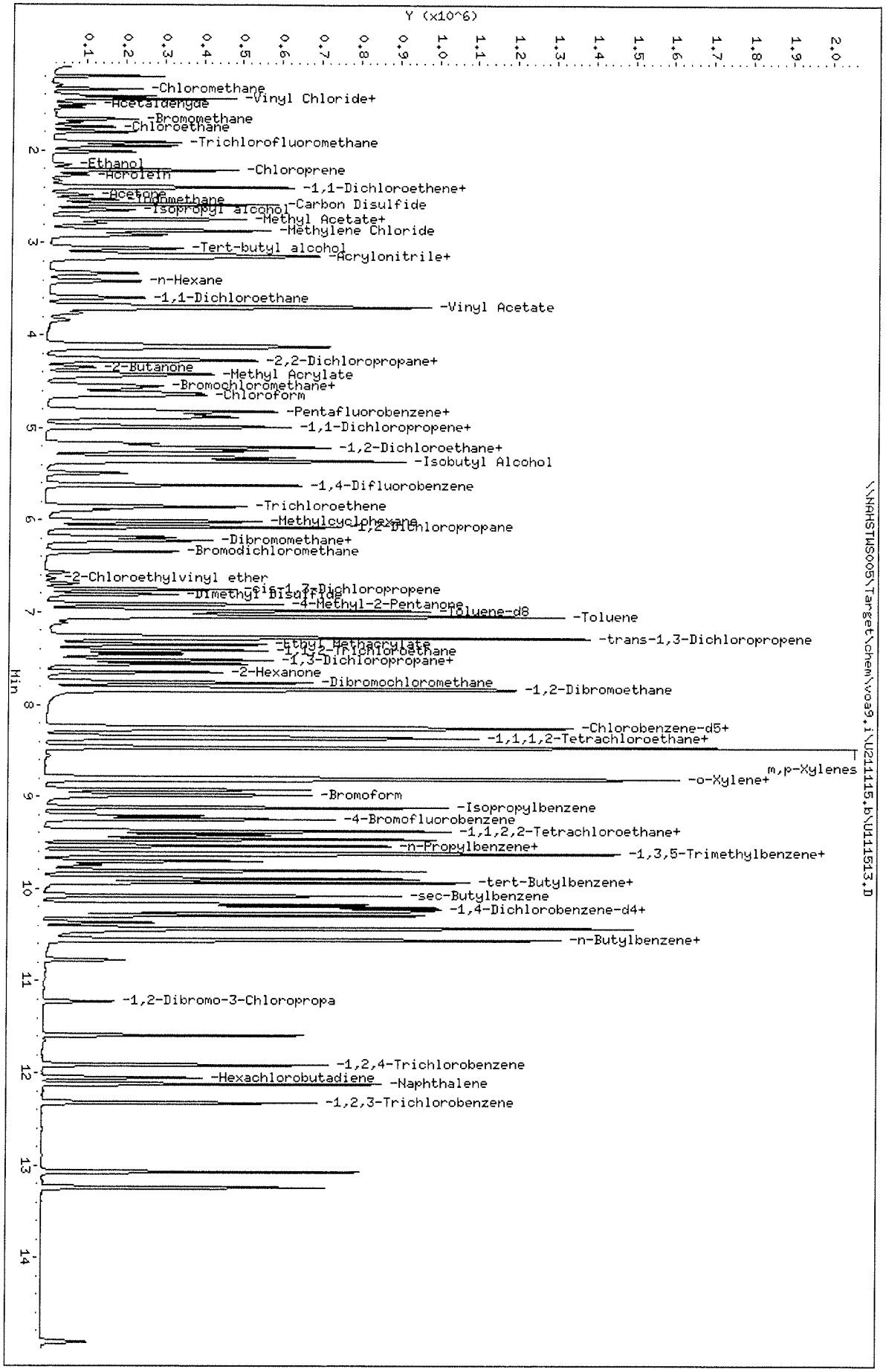
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.887	4.883	(1.000)	284064	50.0000	
* 36 1,4-Difluorobenzene	114	5.618	5.614	(1.000)	484722	50.0000	
* 47 Chlorobenzene-d5	117	8.242	8.242	(1.000)	441442	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	220674	50.0000	
$ 30 Dibromofluoromethane	113	4.823	4.819	(0.987)	157305	52.8049	52.80
$ 35 1,2-Dichloroethane-d4	65	5.168	5.168	(1.058)	183207	52.6492	52.64
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	578307	50.3349	50.33
$ 69 4-Bromofluorobenzene	95	9.246	9.250	(1.122)	224672	52.4648	52.46
60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	149257	48.7916	48.79
31 1,1,1-Trichloroethane	97	4.815	4.812	(0.985)	210930	51.5822	51.58
68 1,1,2,2-Tetrachloroethane	83	9.381	9.385	(0.918)	233777	50.3319	50.33
53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	131825	50.6785	50.67
22 1,1-Dichloroethane	63	3.593	3.586	(0.735)	241068	47.7683	47.76
11 1,1-Dichloroethene	96	2.394	2.386	(0.490)	122139	48.2264	48.22
32 1,1-Dichloropropene	75	4.991	4.988	(0.889)	195154	49.0277	49.02
93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	194769	49.2851	49.28
71 1,2,3-Trichloropropane	75	9.419	9.419	(0.921)	241453	52.9455	52.94
90 1,2,4-Trichlorobenzene	180	11.912	11.912	(1.165)	205098	50.4960	50.49
79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	547052	49.4489	49.44
89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	36047	47.0718	47.07
57 1,2-Dibromoethane	107	7.844	7.844	(0.952)	167352	52.9622	52.96
88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	305551	49.1003	49.10

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111513.D Page 2
Report Date: 20-Dec-2021 15:39

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.243	(0.934)	217435	49.7252	49.72
42	1,2-Dichloropropane	63	6.075	6.071	(1.081)	154517	50.6599	50.65
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	525006	48.3897	48.38
83	1,3-Dichlorobenzene	146	10.168	10.172	(0.995)	305860	48.1239	48.12
54	1,3-Dichloropropane	76	7.556	7.556	(0.917)	276841	49.9461	49.94
84	1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	317845	48.6012	48.60
26	2,2-Dichloropropane	77	4.264	4.257	(0.873)	149988	52.4410	52.44
24	2-Butanone	43	4.347	4.347	(0.890)	146702	98.7644	98.76
76	2-Chlorotoluene	91	9.539	9.539	(0.933)	458017	48.1995	48.19
52	2-Hexanone	43	7.646	7.649	(0.928)	236040	112.639	112.63
77	4-Chlorotoluene	91	9.629	9.632	(0.942)	539200	48.9631	48.96
82	p-Isopropyltoluene	119	10.202	10.202	(0.998)	523508	48.6806	48.68
45	4-Methyl-2-Pentanone	43	6.911	6.915	(0.839)	330171	103.852	103.85
10	Acetone	43	2.476	2.472	(0.507)	101577	102.635	102.63
37	Benzene	78	5.209	5.205	(0.927)	613633	50.0652	50.06
74	Bromobenzene	156	9.374	9.374	(0.917)	174545	51.0044	51.00
29	Bromochloromethane	128	4.545	4.542	(0.930)	84018	52.4360	52.43
39	Bromodichloromethane	83	6.341	6.337	(1.129)	186469	47.3284	47.32
66	Bromoform	173	8.973	8.976	(1.089)	100202	48.3130	48.31
6	Bromomethane	94	1.659	1.644	(0.340)	103205	59.0539	59.05
19	Carbon Disulfide	76	2.581	2.574	(0.528)	706398	100.495	100.49
34	Carbon Tetrachloride	117	4.980	4.980	(0.887)	174535	45.4435	45.44
59	Chlorobenzene	112	8.264	8.268	(1.003)	418271	48.6028	48.60
7	Chloroethane	64	1.745	1.726	(0.357)	105520	44.8919	44.89(M)
28	Chloroform	83	4.647	4.647	(0.951)	274842	50.2297	50.22
3	Chloromethane	50	1.337	1.329	(0.274)	144132	50.9348	50.93
27	cis-1,2-Dichloroethene	96	4.275	4.272	(0.875)	172874	49.8115	49.81
46	cis-1,3-Dichloropropene	75	6.750	6.750	(1.202)	244859	47.9988	47.99
55	Dibromochloromethane	129	7.751	7.750	(0.940)	159082	47.9094	47.90
44	Dibromomethane	93	6.184	6.184	(1.101)	106658	51.2713	51.27
2	Dichlorodifluoromethane	85	1.202	1.194	(0.246)	161569	47.6202	47.62
61	Ethylbenzene	106	8.362	8.362	(1.015)	211842	49.1848	49.18
91	Hexachlorobutadiene	225	12.054	12.054	(1.179)	72925	48.5787	48.57
67	Isopropylbenzene	105	9.115	9.119	(1.106)	624216	48.1318	48.13
62	m,p-Xylenes	106	8.463	8.463	(1.027)	534173	100.376	100.37
17	Methylene Chloride	84	2.862	2.855	(0.586)	151865	45.3661	45.36
87	n-Butylbenzene	91	10.547	10.547	(1.032)	450936	46.7664	46.76
73	n-Propylbenzene	91	9.467	9.467	(0.926)	726518	48.4726	48.47
92	Naphthalene	128	12.121	12.121	(1.186)	610596	50.2191	50.21
63	o-Xylene	106	8.800	8.804	(1.068)	261202	49.5552	49.55
81	sec-Butylbenzene	105	10.078	10.078	(0.986)	579302	47.0438	47.04
64	Styrene	104	8.815	8.815	(1.070)	469983	51.9253	51.92
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	434765	47.5378	47.53
56	Tetrachloroethene	164	7.514	7.514	(0.912)	115893	46.5507	46.55
50	Toluene	91	7.038	7.038	(0.854)	644212	48.7803	48.78
20	trans-1,2-Dichloroethene	96	3.132	3.125	(0.641)	138064	48.3258	48.32
51	trans-1,3-Dichloropropene	75	7.252	7.252	(1.291)	207482	47.4845	47.48
38	Trichloroethene	130	5.854	5.850	(1.042)	161856	51.1125	51.11
8	Trichlorofluoromethane	101	1.948	1.936	(0.399)	216391	47.2358	47.23
5	Vinyl Chloride	62	1.415	1.408	(0.290)	163317	47.5379	47.53

QC Flag Legend

M - Compound response manually integrated.

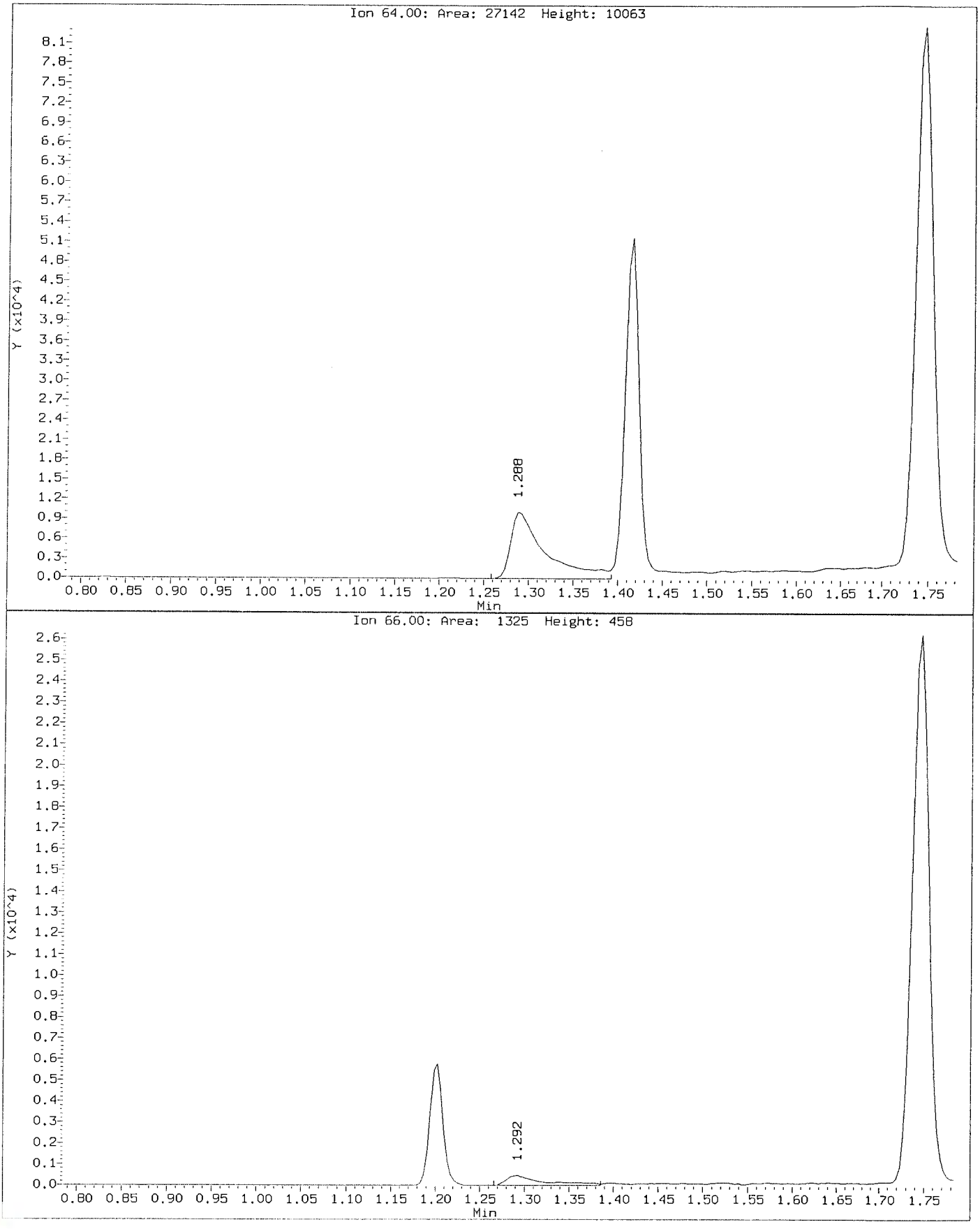


Data File: \\NAHSTWS005\Target\chem\woa9,i\U211115,b\U111513,D
Date : 15-NOV-2021 18:18
Client ID: ICV
Sample Info: VSTD050;VSTD050;2;;;ICV
Purge Volume: 5.0
Column phase: DB624

Instrument: WOA9,i
Operator: PC
Column diameter: 0.18

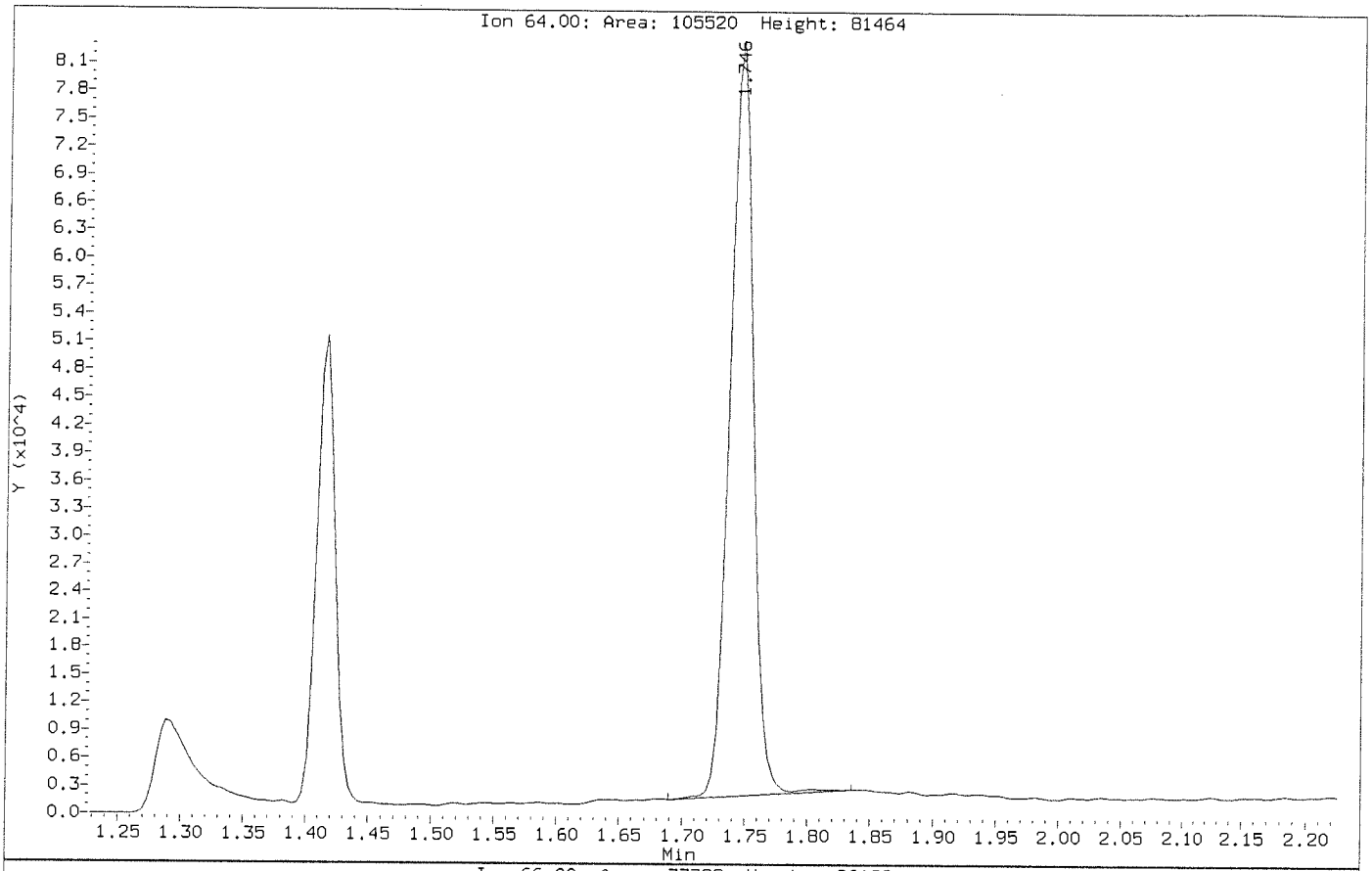
Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111513.D
Injection Date: 15-NOV-2021 18:18
Instrument: VOA9.i
Client Sample ID: ICV

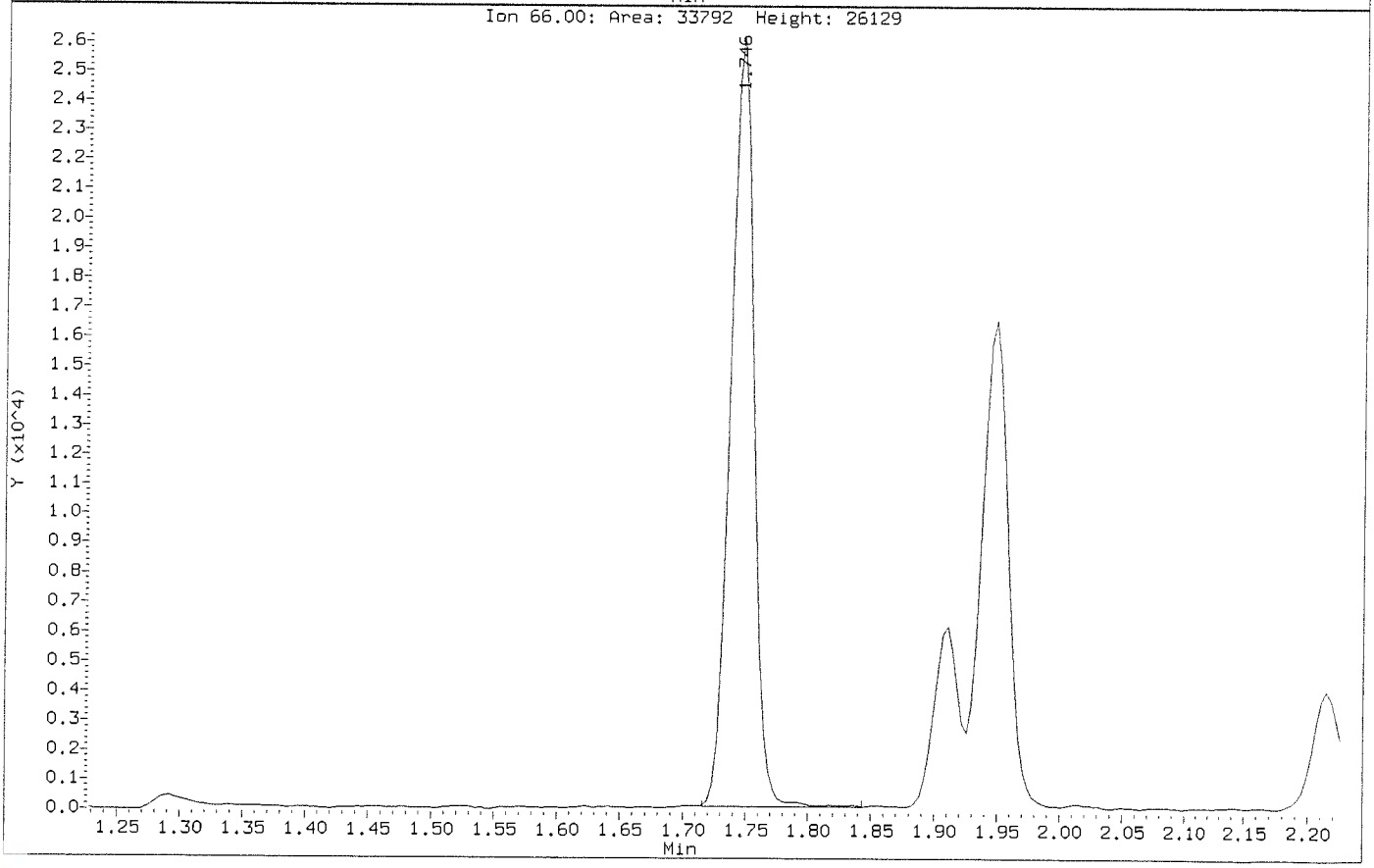
Compound: Chloroethane
CAS Number: 75-00-3



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111513.D
Injection Date: 15-NOV-2021 18:18
Instrument: VOA9.i
Client Sample ID: ICV

Compound: Chloroethane
CAS Number: 75-00-3





MSVOA09 -Logbook

Batch: 47555 **Analyst:** Presenta Cabascango
Date: 12-15-2021 **Reviewer:**
Method: 8260 **Laboratory:** Houston
Comments:

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
1	BFB	BFB	12-15-2021 12:06 pm	1.00	0.00 mL	0.00 mL	U121501.D	Liquid	Y	NA
2	VSTD050	CCV	12-15-2021 12:28 pm	1.00	5.00 mL	0.00 mL	U121502a.D	Liquid	Y	NA
3	VSTD050	CCV	12-15-2021 12:50 pm	1.00	5.00 mL	0.00 mL	U121503.D	Liquid	Y	NA
4	CCB	SAMP	12-15-2021 01:13 pm	1.00	5.00 mL	0.00 mL	U121504.D	Liquid	Y	NA
5	VLCSW-211215	LCS	12-15-2021 01:35 pm	1.00	5.00 mL	0.00 mL	U121505.D	Liquid	Y	NA
6	BLANK	SAMP	12-15-2021 01:57 pm	1.00	5.00 mL	0.00 mL	U121506.D	Liquid	Y	NA
7	VBLKW-211215	MBLK	12-15-2021 02:20 pm	1.00	5.00 mL	0.00 mL	U121507.D	Liquid	Y	NA
8	HS21120229-08	SAMP	12-15-2021 02:42 pm	1.00	5.00 mL	0.00 mL	U121508.D	Liquid	Y	NA
9	HS21120155-01	SAMP	12-15-2021 03:04 pm	100.0(	5.00 mL	0.00 mL	U121509.D	Liquid	Y	NA
10	HS21120155-02	SAMP	12-15-2021 03:27 pm	500.0(	5.00 mL	0.00 mL	U121510.D	Liquid	Y	NA
11	HS21120243-02	SAMP	12-15-2021 03:49 pm	1.00	5.00 mL	0.00 mL	U121511.D	Liquid	Y	NA
12	HS21120255-05	SAMP	12-15-2021 04:11 pm	1.00	5.00 mL	0.00 mL	U121512.D	Liquid	Y	NA
13	HS21120243-02MS	MS	12-15-2021 04:34 pm	1.00	5.00 mL	0.00 mL	U121513.D	Liquid	Y	NA
14	HS21120243-02MSD	MSD	12-15-2021 04:56 pm	1.00	5.00 mL	0.00 mL	U121514.D	Liquid	Y	NA
15	HS21120255-05MS	MS	12-15-2021 05:19 pm	1.00	5.00 mL	0.00 mL	U121515.D	Liquid	Y	NA
16	HS21120255-05MSD	MSD	12-15-2021 05:41 pm	1.00	5.00 mL	0.00 mL	U121516.D	Liquid	Y	NA
17	HS21120182-01	SAMP	12-15-2021 06:03 pm	1000.0	5.00 mL	0.00 mL	U121517.D	Liquid	Y	NA
18	HS21120243-06	SAMP	12-15-2021 06:26 pm	1.00	5.00 mL	0.00 mL	U121518.D	Liquid	Y	NA
19	HS21120255-08	SAMP	12-15-2021 06:48 pm	1.00	5.00 mL	0.00 mL	U121519.D	Liquid	Y	NA
20	HS21120675-04	SAMP	12-15-2021 07:10 pm	1.00	5.00 mL	0.00 mL	U121520.D	Liquid	Y	NA
21	HS21120255-07	SAMP	12-15-2021 07:33 pm	1.00	5.00 mL	0.00 mL	U121521.D	Liquid	Y	NA
22	HS21120243-01	SAMP	12-15-2021 07:55 pm	1.00	5.00 mL	0.00 mL	U121522.D	Liquid	Y	NA
23	HS21120243-03	SAMP	12-15-2021 08:17 pm	1.00	5.00 mL	0.00 mL	U121523.D	Liquid	Y	NA
24	HS21120243-04	SAMP	12-15-2021 08:40 pm	1.00	5.00 mL	0.00 mL	U121524.D	Liquid	Y	NA
25	HS21120243-05	SAMP	12-15-2021 09:02 pm	1.00	5.00 mL	0.00 mL	U121525.D	Liquid	Y	NA
26	HS21120255-01	SAMP	12-15-2021 09:24 pm	1.00	5.00 mL	0.00 mL	U121526.D	Liquid	Y	NA
27	HS21120255-02	SAMP	12-15-2021 09:47 pm	1.00	5.00 mL	0.00 mL	U121527.D	Liquid	Y	NA
28	HS21120255-03	SAMP	12-15-2021 10:09 pm	1.00	5.00 mL	0.00 mL	U121528.D	Liquid	Y	NA
29	HS21120675-01	SAMP	12-15-2021 10:32 pm	1.00	5.00 mL	0.00 mL	U121529.D	Liquid	Y	NA
30	HS21120675-02	SAMP	12-15-2021 10:54 pm	1.00	5.00 mL	0.00 mL	U121530.D	Liquid	Y	NA
31	HS21120675-03	SAMP	12-15-2021 11:16 pm	1.00	5.00 mL	0.00 mL	U121531.D	Liquid	Y	NA
32	VSTD050-END	CCV	12-15-2021 11:39 pm	1.00	5.00 mL	0.00 mL	U121532.D	Liquid	Y	NA
33	BFB	BFB	12-16-2021 12:01 am	1.00	0.00 mL	0.00 mL	V121501.D	Liquid	Y	NA
34	VSTD050	CCV	12-16-2021 12:23 am	1.00	5.00 mL	0.00 mL	V121502.D	Liquid	Y	NA
35	VSTD050	CCV	12-16-2021 12:45 am	1.00	5.00 mL	0.00 mL	V121503a.D	Liquid	Y	NA
36	CCB	SAMP	12-16-2021 01:08 am	1.00	5.00 mL	0.00 mL	V121504.D	Liquid	Y	NA
37	VLCSW-211213	LCS	12-16-2021 01:30 am	1.00	5.00 mL	0.00 mL	V121505.D	Liquid	Y	NA
38	BLANK	SAMP	12-16-2021 01:52 am	1.00	5.00 mL	0.00 mL	V121506.D	Liquid	Y	NA
39	VBLKW-211213	MBLK	12-16-2021 02:14 am	1.00	5.00 mL	0.00 mL	V121507.D	Liquid	Y	NA
40	HS21120806-01	SAMP	12-16-2021 02:37 am	1.00	5.00 mL	0.00 mL	V121508.D	Liquid	Y	NA
41	HS21120806-01MS	MS	12-16-2021 02:59 am	1.00	5.00 mL	0.00 mL	V121509.D	Liquid	Y	NA

MSVOA09 -Logbook

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
42	HS21120806-01MSD	MSD	12-16-2021 03:21 am	1.00	5.00 mL	0.00 mL	V121510.D	Liquid	Y	NA
43	HS21120806-02	SAMP	12-16-2021 03:44 am	1.00	5.00 mL	0.00 mL	V121511.D	Liquid	Y	NA
44	HS21120807-06	SAMP	12-16-2021 04:06 am	1.00	5.00 mL	0.00 mL	V121512.D	Liquid	Y	NA
45	HS21120873-06	SAMP	12-16-2021 04:29 am	1.00	5.00 mL	0.00 mL	V121513.D	Liquid	Y	NA
46	HS21120873-07	SAMP	12-16-2021 04:51 am	1.00	5.00 mL	0.00 mL	V121514.D	Liquid	Y	NA
47	HS21120878-02	SAMP	12-16-2021 05:13 am	1.00	5.00 mL	0.00 mL	V121515.D	Liquid	Y	NA
48	HS21120878-04	SAMP	12-16-2021 05:35 am	1.00	5.00 mL	0.00 mL	V121516.D	Liquid	Y	NA
49	HS21120807-01	SAMP	12-16-2021 05:58 am	1.00	5.00 mL	0.00 mL	V121517.D	Liquid	Y	NA
50	HS21120807-02	SAMP	12-16-2021 06:20 am	1.00	5.00 mL	0.00 mL	V121518.D	Liquid	Y	NA
51	HS21120807-03	SAMP	12-16-2021 06:42 am	1.00	5.00 mL	0.00 mL	V121519.D	Liquid	Y	NA
52	HS21120807-04	SAMP	12-16-2021 07:05 am	1.00	5.00 mL	0.00 mL	V121520.D	Liquid	Y	NA
53	HS21120807-05	SAMP	12-16-2021 07:27 am	1.00	5.00 mL	0.00 mL	V121521.D	Liquid	Y	NA
54	HS21120873-01	SAMP	12-16-2021 07:50 am	1.00	5.00 mL	0.00 mL	V121522.D	Liquid	Y	NA
55	HS21120873-02	SAMP	12-16-2021 08:12 am	1.00	5.00 mL	0.00 mL	V121523.D	Liquid	Y	NA
56	HS21120873-03	SAMP	12-16-2021 08:34 am	1.00	5.00 mL	0.00 mL	V121524.D	Liquid	Y	NA
57	HS21120873-04	SAMP	12-16-2021 08:57 am	1.00	5.00 mL	0.00 mL	V121525.D	Liquid	Y	NA
58	HS21120873-05	SAMP	12-16-2021 09:19 am	1.00	5.00 mL	0.00 mL	V121526.D	Liquid	Y	NA
59	HS21120878-01	SAMP	12-16-2021 09:42 am	1.00	5.00 mL	0.00 mL	V121527.D	Liquid	Y	NA
60	HS21120878-03	SAMP	12-16-2021 10:04 am	1.00	5.00 mL	0.00 mL	V121528.D	Liquid	Y	NA
61	HS21120806-03	SAMP	12-16-2021 10:26 am	1.00	5.00 mL	0.00 mL	V121529.D	Liquid	Y	NA

FORM 2
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120243

	CLIENT SAMPLE NO.	SMC1 (DCE) #	SMC2 #	SMC3 (TOL) #	OTHER #	TOT OUT
01	VLSCW-211215	116	108	99	102	0
02	VBLKW-211215	106	100	104	102	0
03	HS21120243-02	108	102	103	100	0
04	HS21120243-02MS	105	101	106	107	0
05	HS21120243-02MSD	104	103	105	106	0
06	HS21120255-05MS	105	103	105	105	0
07	HS21120255-05MSD	105	101	105	104	0
08	HS21120243-06	108	101	104	101	0
09	HS21120243-01	109	100	104	100	0
10	HS21120243-03	111	101	104	102	0
11	HS21120243-04	109	100	103	100	0
12	HS21120243-05	108	100	103	100	0
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		QC LIMITS
SMC1 (DCE)	= 1,2-Dichloroethane-d4	(0-130)
SMC2	= Dibromofluoromethane	(0-130)
SMC3 (TOL)	= Toluene-d8	(0-130)
OTHER	= 4-Bromofluorobenzene	(0-130)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

VBLKW-211215

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120243

Lab File ID: U121507 Lab Sample ID: VBLKW-211215

Date Analyzed: 12/15/21 Time Analyzed: 1420

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

Instrument ID: VOA9

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VLSCW-211215	VLCSW-211215	U121505	1335
02	HS21120243-02	HS21120243-02	U121511	1549
03	HS21120243-02MS	HS21120243-02MS	U121513	1634
04	HS21120243-02MSD	HS21120243-02MSD	U121514	1656
05	HS21120255-05MS	HS21120255-05MS	U121515	1719
06	HS21120255-05MSD	HS21120255-05MSD	U121516	1741
07	HS21120243-06	HS21120243-06	U121518	1826
08	HS21120243-01	HS21120243-01	U121522	1955
09	HS21120243-03	HS21120243-03	U121523	2017
10	HS21120243-04	HS21120243-04	U121524	2040
11	HS21120243-05	HS21120243-05	U121525	2102
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COMMENTS:

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120243

Lab File ID: U121501 BFB Injection Date: 12/15/21

Instrument ID: VOA9 BFB Injection Time: 1206

GC Column: DB624 ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	17.3
75	30.0 - 60.0% of mass 95	49.2
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.2
173	Less than 2.0% of mass 174	1.3 (2.0)1
174	Greater than 50.0% of mass 95	66.4
175	5.0 - 9.0% of mass 174	5.3 (8.0)1
176	95.0 - 101.0% of mass 174	63.1 (95.1)1
177	5.0 - 9.0% of mass 176	4.3 (6.9)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CCV	CCV	U121503	12/15/21	1250
02	VLSCW-211215	VLCSW-211215	U121505	12/15/21	1335
03	VBLKW-211215	VBLKW-211215	U121507	12/15/21	1420
04	HS21120243-02	HS21120243-02	U121511	12/15/21	1549
05	HS21120243-02MS	HS21120243-02MS	U121513	12/15/21	1634
06	HS21120243-02MSD	HS21120243-02MSD	U121514	12/15/21	1656
07	HS21120255-05MS	HS21120255-05MS	U121515	12/15/21	1719
08	HS21120255-05MSD	HS21120255-05MSD	U121516	12/15/21	1741
09	HS21120243-06	HS21120243-06	U121518	12/15/21	1826
10	HS21120243-01	HS21120243-01	U121522	12/15/21	1955
11	HS21120243-03	HS21120243-03	U121523	12/15/21	2017
12	HS21120243-04	HS21120243-04	U121524	12/15/21	2040
13	HS21120243-05	HS21120243-05	U121525	12/15/21	2102
14	CCV-END	CCV-END	U121532	12/15/21	2339
15					
16					
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22					

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120243

Instrument ID: VOA9 Calibration Date: 12/15/21 Time: 1250

Lab File ID: U121503 Init. Calib. Date(s): 11/15/21 11/15/21

Init. Calib. Times: 1352 1734

GC Column: DB624 ID: 0.18 (mm)

COMPOUND	RRF or AMOUNT	RRF50.000 or AMOUNT	CCAL RRF50.000	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE	
cis-1,3-Dichloropropene	53.255269	50.000000	0.5625591	0.2	-6.51	20.00	LINR	
trans-1,3-Dichloropropene	53.159221	50.000000	0.4815788	0.1	-6.32	20.00	LINR	
1,3-Dichlorobenzene	1.4400000	1.4048867	1.4048867	0.6	2.44	20.00	AVRG	
2,2-Dichloropropane	0.5030000	0.6363454	0.6363454	0.1	-26.51	20.00	AVRG	<-
1,1-Dichloropropene	0.4100000	0.4475718	0.4475718	0.1	-9.16	20.00	AVRG	
Dibromomethane	0.2140000	0.2377617	0.2377617	0.1	-11.10	20.00	AVRG	
1,2-Dibromoethane	0.3580000	0.4106592	0.4106592	0.1	-14.71	20.00	AVRG	
trans-1,2-Dichloroethene	0.5030000	0.5545582	0.5545582	0.1	-10.25	20.00	AVRG	
1,1,1,2-Tetrachloroethane	50.542342	50.000000	0.3504530	0.1	-1.08	20.00	LINR	
1,1,1-Trichloroethane	0.7200000	0.8270849	0.8270849	0.1	-14.87	20.00	AVRG	
1,1,2,2-Tetrachloroethane	1.0520000	1.2010889	1.2010889	0.3	-14.17	20.00	AVRG	
1,1,2-Trichloroethane	0.2950000	0.3370822	0.3370822	0.1	-14.26	20.00	AVRG	
1,1-Dichloroethane	0.8880000	1.0642827	1.0642827	0.2	-19.85	20.00	AVRG	
1,1-Dichloroethene	0.4460000	0.4890120	0.4890120	0.1	-9.64	20.00	AVRG	
Trichloroethene	0.3260000	0.3339454	0.3339454	0.2	-2.44	20.00	AVRG	
1,2,3-Trichlorobenzene	0.8950000	0.8011271	0.8011271	0.1	10.49	20.00	AVRG	
Trichlorofluoromethane	0.8060000	0.9269425	0.9269425	0.1	-15.00	20.00	AVRG	
1,2,4-Trichlorobenzene	0.9200000	0.8316148	0.8316148	0.2	9.61	20.00	AVRG	
1,2,4-Trimethylbenzene	2.5070000	2.6140972	2.6140972	0.1	-4.27	20.00	AVRG	
Tetrachloroethene	0.2820000	0.2571353	0.2571353	0.2	8.82	20.00	AVRG	
1,2-Dichlorobenzene	1.4100000	1.4225295	1.4225295	0.4	-0.89	20.00	AVRG	
1,2-Dichloroethane	0.4510000	0.5088350	0.5088350	0.1	-12.82	20.00	AVRG	
1,2-Dichloropropane	0.3150000	0.3705906	0.3705906	0.1	-17.65	20.00	AVRG	
1,3,5-Trimethylbenzene	2.4580000	2.4752403	2.4752403	0.1	-0.70	20.00	AVRG	
1,3-Dichloropropane	0.6280000	0.7250638	0.7250638	0.1	-15.46	20.00	AVRG	
1,4-Dichlorobenzene	1.4820000	1.4705751	1.4705751	0.4	0.77	20.00	AVRG	
Toluene	1.4960000	1.6282456	1.6282456	0.4	-8.84	20.00	AVRG	
2-Butanone	0.2610000	0.2857606	0.2857606	0.1	-9.49	20.00	AVRG	
2-Chlorotoluene	2.1530000	2.2803539	2.2803539	0.1	-5.92	20.00	AVRG	
2-Hexanone	0.2370000	0.2833160	0.2833160	0.1	-19.54	20.00	AVRG	
4-Chlorotoluene	2.4950000	2.6792131	2.6792131	0.1	-7.38	20.00	AVRG	
tert-Butylbenzene	2.0720000	1.9595988	1.9595988	0.1	5.42	20.00	AVRG	
4-Methyl-2-Pentanone	0.3600000	0.4084130	0.4084130	0.1	-13.45	20.00	AVRG	
Acetone	118.56951	100.00000	0.2048657	0.1	-18.57	20.00	LINR	
Benzene	1.2640000	1.4227475	1.4227475	0.5	-12.56	20.00	AVRG	
Bromobenzene	0.7750000	0.7997381	0.7997381	0.1	-3.19	20.00	AVRG	
Bromochloromethane	0.2820000	0.3230380	0.3230380	0.1	-14.55	20.00	AVRG	
Bromodichloromethane	53.857946	50.000000	0.4389547	0.2	-7.72	20.00	LINR	
Bromoform	45.918742	50.000000	0.2151402	0.1	8.16	20.00	2RDR	
Bromomethane	54.464592	50.000000	0.3353243	0.1	-8.93	20.00	LINR	
Carbon Disulfide	1.2370000	1.4103960	1.4103960	0.1	-14.02	20.00	AVRG	
Carbon Tetrachloride	47.809008	50.000000	0.3794581	0.1	4.38	20.00	LINR	

FORM VII VOA

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS2112024

Instrument ID: VOA9 Calibration Date: 12/15/21 Time: 1250

Lab File ID: U121503 Init. Calib. Date(s): 11/15/21 11/15/21

Init. Calib. Times: 1352 1734

GC Column: DB624 ID: 0.18 (mm)

COMPOUND	RRF or AMOUNT	RRF50.000 or AMOUNT	CCAL RRF50.000	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE	
Chlorobenzene	0.9750000	1.0171465	1.0171465	0.5	-4.32	20.00	AVRG	
Chloroethane	0.4140000	0.4675571	0.4675571	0.1	-12.94	20.00	AVRG	
Chloroform	0.9630000	1.1408722	1.1408722	0.2	-18.47	20.00	AVRG	
Chloromethane	62.048797	50.000000	0.6168472	0.1	-24.10	20.00	LINR	<-
cis-1,2-Dichloroethene	0.6110000	0.6951146	0.6951146	0.1	-13.77	20.00	AVRG	
Dibromochloromethane	50.569238	50.000000	0.3810222	0.1	-1.14	20.00	LINR	
Dichlorodifluoromethane	59.649516	50.000000	0.7103382	0.1	-19.30	20.00	LINR	
Ethylbenzene	0.4880000	0.5064828	0.5064828	0.1	-3.79	20.00	AVRG	
Hexachlorobutadiene	0.3400000	0.3157189	0.3157189	0.1	7.14	20.00	AVRG	
Isopropylbenzene	1.4690000	1.4529945	1.4529945	0.1	1.09	20.00	AVRG	
m,p-Xylenes	0.6030000	0.6333016	0.6333016	0.1	-5.02	20.00	AVRG	
Methylene Chloride	0.5890000	0.6334820	0.6334820	0.1	-7.55	20.00	AVRG	
n-Butylbenzene	2.1850000	2.1782032	2.1782032	0.5	0.31	20.00	AVRG	
n-Propylbenzene	3.3960000	3.5330456	3.5330456	0.1	-4.04	20.00	AVRG	
Naphthalene	2.7550000	2.5921233	2.5921233	0.2	5.91	20.00	AVRG	
o-Xylene	0.5970000	0.6260072	0.6260072	0.3	-4.86	20.00	AVRG	
sec-Butylbenzene	2.7900000	2.7117206	2.7117206	0.1	2.80	20.00	AVRG	
Styrene	1.0250000	1.1370448	1.1370448	0.3	-10.93	20.00	AVRG	
Vinyl Chloride	0.6040000	0.7028556	0.7028556	0.1	-16.37	20.00	AVRG	
1,2,3-Trichloropropane	1.0330000	1.1955967	1.1955967	0.1	-15.74	20.00	AVRG	
p-Isopropyltoluene	2.4370000	2.3602021	2.3602021	0.1	3.15	20.00	AVRG	
1,2-Dibromo-3-Chloropropane	43.451508	50.000000	0.1501010	0.05	13.10	20.00	LINR	
1,2-Dichloroethane-d4	56.476267	50.000000	0.6905324	0.1	-12.95	20.00	LINR	
Dibromofluoromethane	55.062942	50.000000	0.5770674	0.1	-10.12	20.00	LINR	
Toluene-d8	1.3010000	1.3402295	1.3402295	0.1	-3.02	20.00	AVRG	
4-Bromofluorobenzene	52.609120	50.000000	0.5103157	0.1	-5.22	20.00	LINR	

FORM VII VOA

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120243

Instrument ID: VOA9 Calibration Date: 12/15/21 Time: 2339

Lab File ID: U121532 Init. Calib. Date(s): 11/15/21 11/15/21

Init. Calib. Times: 1352 1734

GC Column: DB624 ID: 0.18 (mm)

COMPOUND	RRF or AMOUNT	RRF50.000 or AMOUNT	CCAL RRF50.000	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE	
cis-1,3-Dichloropropene	49.969381	50.000000	0.5266741	0.2	0.06	50.00	LINR	
trans-1,3-Dichloropropene	48.401618	50.000000	0.4366954	0.1	3.20	50.00	LINR	
1,3-Dichlorobenzene	1.4400000	1.4610639	1.4610639	0.6	-1.46	50.00	AVRG	
2,2-Dichloropropane	0.5030000	0.4286495	0.4286495	0.1	14.78	50.00	AVRG	
1,1-Dichloropropene	0.4100000	0.4641268	0.4641268	0.1	-13.20	50.00	AVRG	
Dibromomethane	0.2140000	0.2430137	0.2430137	0.1	-13.56	50.00	AVRG	
1,2-Dibromoethane	0.3580000	0.4082577	0.4082577	0.1	-14.04	50.00	AVRG	
trans-1,2-Dichloroethene	0.5030000	0.5974205	0.5974205	0.1	-18.77	50.00	AVRG	
1,1,1,2-Tetrachloroethane	50.688298	50.000000	0.3514818	0.1	-1.38	50.00	LINR	
1,1,1-Trichloroethane	0.7200000	0.9162251	0.9162251	0.1	-27.25	50.00	AVRG	
1,1,2,2-Tetrachloroethane	1.0520000	1.1671250	1.1671250	0.3	-10.94	50.00	AVRG	
1,1,2-Trichloroethane	0.2950000	0.3391166	0.3391166	0.1	-14.95	50.00	AVRG	
1,1-Dichloroethane	0.8880000	1.1686822	1.1686822	0.2	-31.61	50.00	AVRG	
1,1-Dichloroethene	0.4460000	0.5424959	0.5424959	0.1	-21.64	50.00	AVRG	
Trichloroethene	0.3260000	0.3752438	0.3752438	0.2	-15.10	50.00	AVRG	
1,2,3-Trichlorobenzene	0.8950000	0.8544490	0.8544490	0.1	4.53	50.00	AVRG	
Trichlorofluoromethane	0.8060000	1.0409081	1.0409081	0.1	-29.14	50.00	AVRG	
1,2,4-Trichlorobenzene	0.9200000	0.8609996	0.8609996	0.2	6.41	50.00	AVRG	
1,2,4-Trimethylbenzene	2.5070000	2.7364509	2.7364509	0.1	-9.15	50.00	AVRG	
Tetrachloroethene	0.2820000	0.2655447	0.2655447	0.2	5.84	50.00	AVRG	
1,2-Dichlorobenzene	1.4100000	1.4761036	1.4761036	0.4	-4.69	50.00	AVRG	
1,2-Dichloroethane	0.4510000	0.5247241	0.5247241	0.1	-16.35	50.00	AVRG	
1,2-Dichloropropane	0.3150000	0.3809544	0.3809544	0.1	-20.94	50.00	AVRG	
1,3,5-Trimethylbenzene	2.4580000	2.6567545	2.6567545	0.1	-8.09	50.00	AVRG	
1,3-Dichloropropane	0.6280000	0.7311714	0.7311714	0.1	-16.43	50.00	AVRG	
1,4-Dichlorobenzene	1.4820000	1.5315633	1.5315633	0.4	-3.34	50.00	AVRG	
Toluene	1.4960000	1.6560083	1.6560083	0.4	-10.70	50.00	AVRG	
2-Butanone	0.2610000	0.3118652	0.3118652	0.1	-19.49	50.00	AVRG	
2-Chlorotoluene	2.1530000	2.3990863	2.3990863	0.1	-11.43	50.00	AVRG	
2-Hexanone	0.2370000	0.2935878	0.2935878	0.1	-23.88	50.00	AVRG	
4-Chlorotoluene	2.4950000	2.8138058	2.8138058	0.1	-12.78	50.00	AVRG	
tert-Butylbenzene	2.0720000	2.1666403	2.1666403	0.1	-4.57	50.00	AVRG	
4-Methyl-2-Pentanone	0.3600000	0.4040816	0.4040816	0.1	-12.24	50.00	AVRG	
Acetone	164.38205	100.00000	0.2798262	0.1	-64.38	50.00	LINR	<-
Benzene	1.2640000	1.4678164	1.4678164	0.5	-16.12	50.00	AVRG	
Bromobenzene	0.7750000	0.8328750	0.8328750	0.1	-7.47	50.00	AVRG	
Bromochloromethane	0.2820000	0.3457007	0.3457007	0.1	-22.59	50.00	AVRG	
Bromodichloromethane	53.183385	50.000000	0.4333490	0.2	-6.37	50.00	LINR	
Bromoform	43.918706	50.000000	0.2052653	0.1	12.16	50.00	2RDR	
Bromomethane	66.730631	50.000000	0.4101384	0.1	-33.46	50.00	LINR	
Carbon Disulfide	1.2370000	1.4859591	1.4859591	0.1	-20.13	50.00	AVRG	
Carbon Tetrachloride	50.146789	50.000000	0.3986165	0.1	-0.29	50.00	LINR	

FORM VII VOA

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS2112024

Instrument ID: VOA9 Calibration Date: 12/15/21 Time: 2339

Lab File ID: U121532 Init. Calib. Date(s): 11/15/21 11/15/21

Init. Calib. Times: 1352 1734

GC Column: DB624 ID: 0.18 (mm)

COMPOUND	RRF or AMOUNT	RRF50.000 or AMOUNT	CCAL RRF50.000	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
Chlorobenzene	0.9750000	1.0306974	1.0306974	0.5	-5.71	50.00	AVRG
Chloroethane	0.4140000	0.5246377	0.5246377	0.1	-26.72	50.00	AVRG
Chloroform	0.9630000	1.2502143	1.2502143	0.2	-29.82	50.00	AVRG
Chloromethane	72.151198	50.000000	0.7163388	0.1	-44.30	50.00	LINR
cis-1,2-Dichloroethene	0.6110000	0.7505674	0.7505674	0.1	-22.84	50.00	AVRG
Dibromochloromethane	48.835112	50.000000	0.3675568	0.1	2.33	50.00	LINR
Dichlorodifluoromethane	66.838226	50.000000	0.7949352	0.1	-33.68	50.00	LINR
Ethylbenzene	0.4880000	0.5164251	0.5164251	0.1	-5.82	50.00	AVRG
Hexachlorobutadiene	0.3400000	0.3054175	0.3054175	0.1	10.17	50.00	AVRG
Isopropylbenzene	1.4690000	1.5312409	1.5312409	0.1	-4.24	50.00	AVRG
m,p-Xylenes	0.6030000	0.6439971	0.6439971	0.1	-6.80	50.00	AVRG
Methylene Chloride	0.5890000	0.6946434	0.6946434	0.1	-17.94	50.00	AVRG
n-Butylbenzene	2.1850000	2.2576900	2.2576900	0.5	-3.33	50.00	AVRG
n-Propylbenzene	3.3960000	3.7948183	3.7948183	0.1	-11.74	50.00	AVRG
Naphthalene	2.7550000	2.7346758	2.7346758	0.2	0.74	50.00	AVRG
o-Xylene	0.5970000	0.6402285	0.6402285	0.3	-7.24	50.00	AVRG
sec-Butylbenzene	2.7900000	2.9478565	2.9478565	0.1	-5.66	50.00	AVRG
Styrene	1.0250000	1.1631667	1.1631667	0.3	-13.48	50.00	AVRG
Vinyl Chloride	0.6040000	0.8064957	0.8064957	0.1	-33.52	50.00	AVRG
1,2,3-Trichloropropane	1.0330000	1.1928864	1.1928864	0.1	-15.48	50.00	AVRG
p-Isopropyltoluene	2.4370000	2.5139806	2.5139806	0.1	-3.16	50.00	AVRG
1,2-Dibromo-3-Chloropropane	43.388126	50.000000	0.1498690	0.05	13.22	50.00	LINR
1,2-Dichloroethane-d4	61.609199	50.000000	0.7516688	0.1	-23.22	50.00	LINR
Dibromofluoromethane	57.576268	50.000000	0.6030032	0.1	-15.15	50.00	LINR
Toluene-d8	1.3010000	1.3313835	1.3313835	0.1	-2.34	50.00	AVRG
4-Bromofluorobenzene	52.017041	50.000000	0.5047157	0.1	-4.03	50.00	LINR

FORM VII VOA

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120243

Lab File ID (Standard): U121503 Date Analyzed: 12/15/21

Instrument ID: VOA9 Time Analyzed: 1250

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

		IS1(CBZ) AREA	#	RT	#	IS2(DFB) AREA	#	RT	#	IS3(DCB) AREA	#	RT	#
	12 HOUR STD	385093		8.24		431352		5.62		188633		10.22	
	UPPER LIMIT	770186		8.74		862704		6.12		377266		10.72	
	LOWER LIMIT	192547		7.74		215676		5.12		94317		9.72	
	CLIENT SAMPLE NO.												
01	VLSCW-211215	392954		8.24		439776		5.62		188975		10.22	
02	VBLKW-211215	407848		8.24		463348		5.62		191512		10.22	
03	HS21120243-02	418458		8.24		467534		5.61		192001		10.23	
04	HS21120243-02MS	400941		8.24		453721		5.61		200113		10.23	
05	HS21120243-02MSD	404768		8.24		456362		5.62		196574		10.23	
06	HS21120255-05MS	405455		8.24		457941		5.61		196579		10.22	
07	HS21120255-05MSD	410024		8.24		458200		5.61		197067		10.22	
08	HS21120243-06	399353		8.24		454244		5.62		185752		10.23	
09	HS21120243-01	388274		8.24		438094		5.62		181244		10.23	
10	HS21120243-03	400061		8.24		447469		5.62		189284		10.23	
11	HS21120243-04	389211		8.24		435132		5.61		179493		10.23	
12	HS21120243-05	390010		8.24		440460		5.62		179940		10.22	
13													
14													
15													
16													
17													
18													
19													
20													

IS1 (CBZ) = Chlorobenzene-d5
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM VIII VOA

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120243

Lab File ID (Standard): U121503 Date Analyzed: 12/15/21

Instrument ID: VOA9 Time Analyzed: 1250

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

		IS4 AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	243767	4.89				
	UPPER LIMIT	487534	5.39				
	LOWER LIMIT	121884	4.39				
	CLIENT SAMPLE NO.						
01	VLSCW-211215	243343	4.89				
02	VBLKW-211215	270515	4.89				
03	HS21120243-02	268891	4.88				
04	HS21120243-02MS	265832	4.88				
05	HS21120243-02MSD	265978	4.88				
06	HS21120255-05MS	265521	4.88				
07	HS21120255-05MSD	270607	4.88				
08	HS21120243-06	262491	4.89				
09	HS21120243-01	250588	4.88				
10	HS21120243-03	258042	4.89				
11	HS21120243-04	251702	4.88				
12	HS21120243-05	254744	4.88				
13							
14							
15							
16							
17							
18							
19							
20							

IS4 = Pentafluorobenzene

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM VIII VOA

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121501.D

Date : 15-DEC-2021 12:06

Client ID: BFB

Instrument: VOA9.i

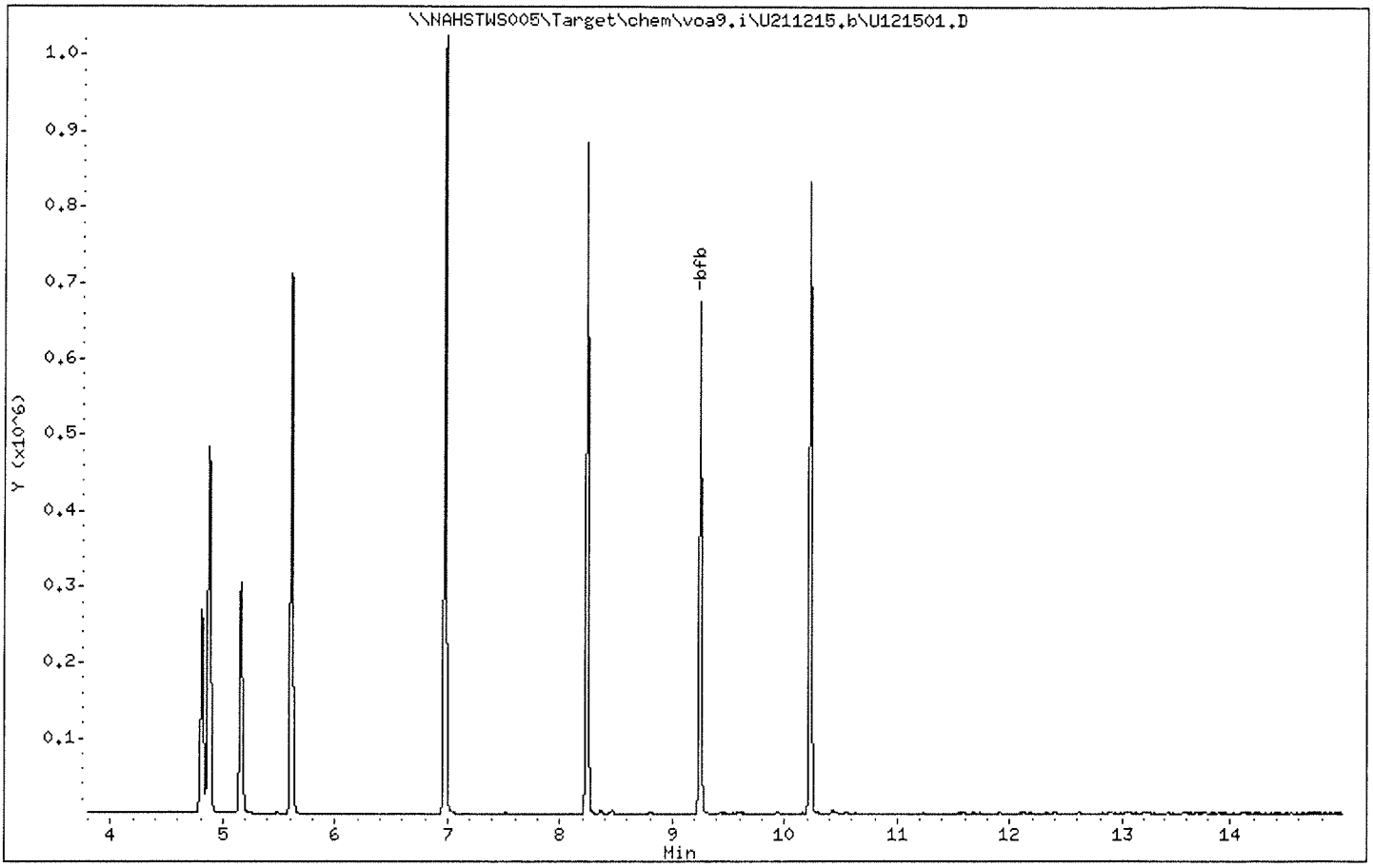
Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121501.D

Date : 15-DEC-2021 12:06

Client ID: BFB

Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

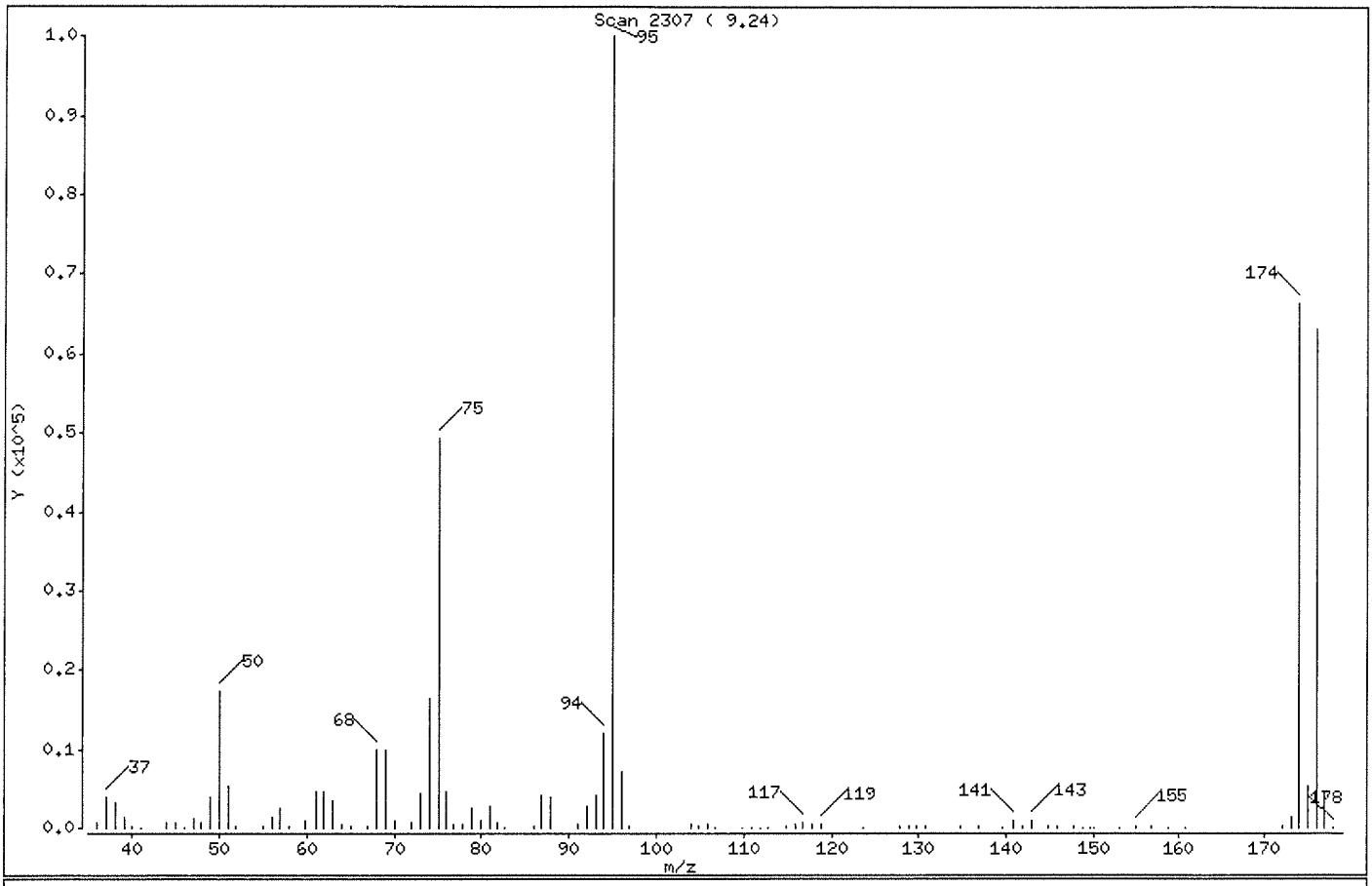
Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25

1 bfb



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
95	Base Peak, 100% relative abundance	100.00
50	15.00 - 40.00% of mass 95	17.30
75	30.00 - 60.00% of mass 95	49.22
96	5.00 - 9.00% of mass 95	7.22
173	Less than 2.00% of mass 174	1.29 (1.95)
174	Greater than 50.00% of mass 95	66.37
175	5.00 - 9.00% of mass 174	5.31 (8.00)
176	95.00 - 101.00% of mass 174	63.10 (95.07)
177	5.00 - 9.00% of mass 176	4.35 (6.89)

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121501.D

Date : 15-DEC-2021 12:06

Client ID: BFB Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0 Operator: PC

Column phase: DB624 Column diameter: 0.25

Data File: U121501.D
Spectrum: Scan 2307 (9.24)
Location of Maximum: 95.00
Number of points: 93

m/z	Y	m/z	Y	m/z	Y	m/z	Y
35.90	673	65.00	187	95.00	100096	140.90	1003
37.00	3857	66.90	333	96.00	7226	141.90	165
38.00	3266	68.00	10018	96.90	176	142.90	859
39.00	1318	69.00	9880	103.90	391	144.80	124
40.00	144	70.00	820	104.80	142	145.80	153
40.90	75	71.90	597	105.90	414	147.80	210
43.90	595	73.00	4422	106.70	87	148.80	52
44.90	718	74.00	16400	109.90	56	149.70	69
45.90	90	75.00	49264	110.90	97	150.10	52
47.00	1095	76.00	4588	111.90	70	152.90	58
47.90	601	76.80	525	112.80	71	154.90	213
49.00	3955	77.90	515	114.80	147	156.80	151
50.00	17320	78.90	2623	115.90	351	158.90	107
51.00	5378	79.90	916	116.80	601	160.80	101
51.90	337	80.90	2836	117.80	348	171.90	243
55.00	264	81.80	630	118.80	513	173.00	1296
56.00	1344	82.70	89	123.70	89	173.90	66432
56.90	2584	85.90	160	127.80	337	174.90	5313
58.00	141	86.90	4251	128.80	145	175.90	63160
59.90	991	87.90	3984	129.80	307	176.90	4352
61.00	4583	90.90	348	130.80	127	177.90	106
62.00	4562	92.00	2701	134.70	151		
63.00	3497	93.00	4112	136.80	125		
63.90	347	94.00	12100	139.50	54		

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Data file : \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121503.D
Lab Smp Id: CCV Client Smp ID: CCV
Inj Date : 15-DEC-2021 12:50
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD050;VSTD050;2;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211215.b\8260C.m
Meth Date : 20-Dec-2021 14:53 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 3 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

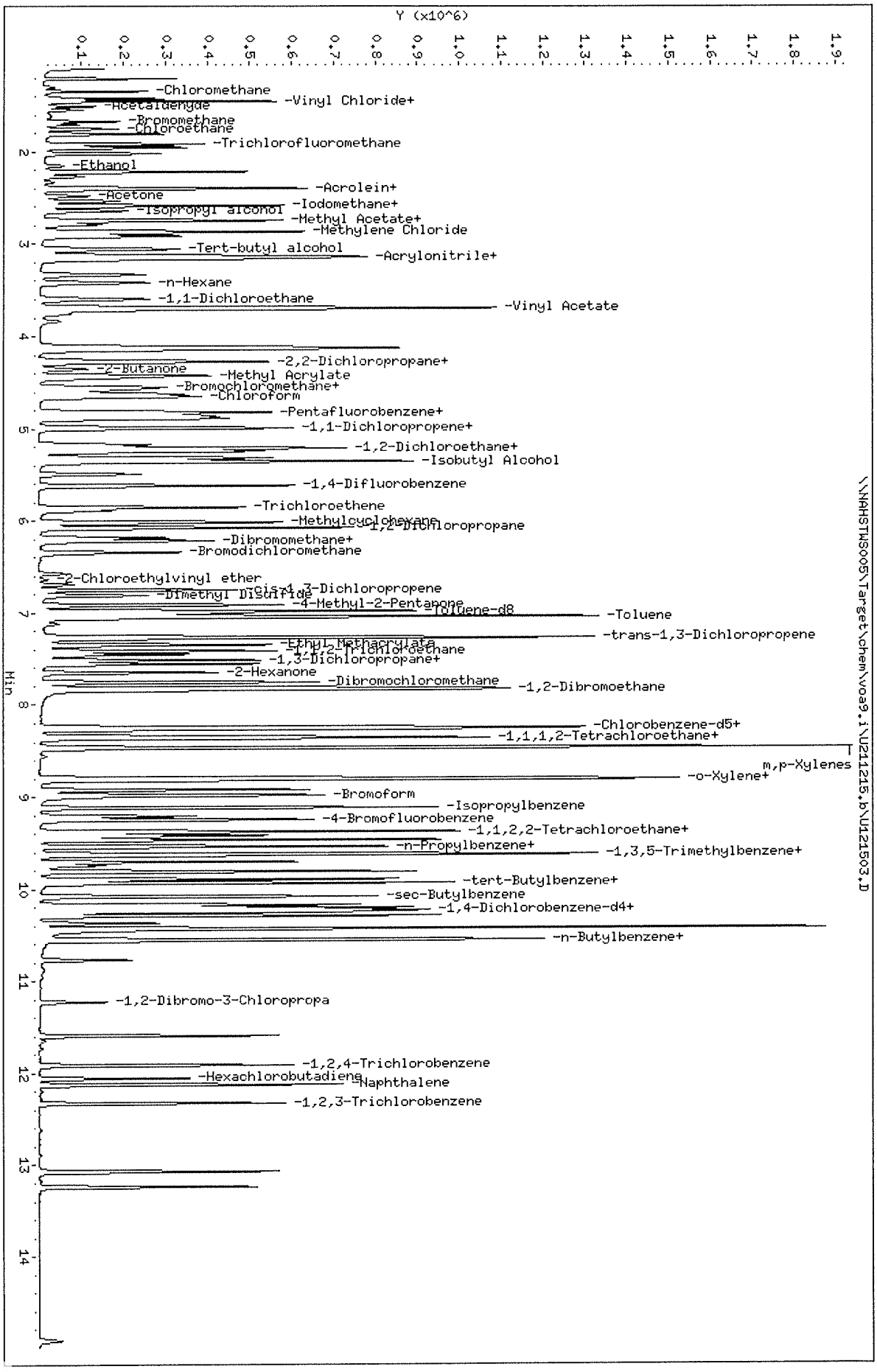
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.886	4.886	(1.000)	243767	50.0000	
* 36 1,4-Difluorobenzene	114	5.617	5.617	(1.000)	431352	50.0000	
* 47 Chlorobenzene-d5	117	8.241	8.241	(1.000)	385093	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.224	10.224	(1.000)	188633	50.0000	
$ 30 Dibromofluoromethane	113	4.823	4.823	(0.987)	140670	50.0000	55.06
$ 35 1,2-Dichloroethane-d4	65	5.171	5.171	(1.058)	168329	50.0000	56.47
$ 48 Toluene-d8	98	6.982	6.982	(0.847)	516113	50.0000	51.49
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	196519	50.0000	52.60
60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	134957	50.0000	50.54
31 1,1,1-Trichloroethane	97	4.819	4.819	(0.986)	201616	50.0000	57.45
68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	226565	50.0000	57.06
53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	129808	50.0000	57.20
22 1,1-Dichloroethane	63	3.597	3.597	(0.736)	259437	50.0000	59.90
11 1,1-Dichloroethene	96	2.397	2.397	(0.491)	119205	50.0000	54.84
32 1,1-Dichloropropene	75	4.995	4.995	(0.889)	193061	50.0000	54.50
93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	151119	50.0000	44.73
71 1,2,3-Trichloropropane	75	9.418	9.418	(0.921)	225529	50.0000	57.85
90 1,2,4-Trichlorobenzene	180	11.911	11.911	(1.165)	156870	50.0000	45.18
79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	493105	50.0000	52.14
89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	28314	50.0000	43.45
57 1,2-Dibromoethane	107	7.844	7.844	(0.952)	158142	50.0000	57.37
88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	268336	50.0000	50.44

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121503.D Page 2
Report Date: 20-Dec-2021 14:53

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.246	(0.934)	219487	50.0000	56.40
42	1,2-Dichloropropane	63	6.075	6.075	(1.081)	159855	50.0000	58.89
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	466912	50.0000	50.34
83	1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	265008	50.0000	48.77
54	1,3-Dichloropropane	76	7.555	7.555	(0.917)	279217	50.0000	57.74
84	1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	277399	50.0000	49.62
26	2,2-Dichloropropane	77	4.264	4.264	(0.873)	155120	50.0000	63.20
24	2-Butanone	43	4.347	4.347	(0.890)	139318	100.000	109.29
76	2-Chlorotoluene	91	9.538	9.538	(0.933)	430150	50.0000	52.95
52	2-Hexanone	43	7.645	7.645	(0.928)	218206	100.000	119.36
77	4-Chlorotoluene	91	9.628	9.628	(0.942)	505388	50.0000	53.68
82	p-Isopropyltoluene	119	10.202	10.202	(0.998)	445212	50.0000	48.43
45	4-Methyl-2-Pentanone	43	6.914	6.914	(0.839)	314554	100.000	113.41
10	Acetone	43	2.480	2.480	(0.508)	99879	100.000	118.56(M)
37	Benzene	78	5.209	5.209	(0.927)	613705	50.0000	56.26
74	Bromobenzene	156	9.374	9.374	(0.917)	150857	50.0000	51.57
29	Bromochloromethane	128	4.549	4.549	(0.931)	78746	50.0000	57.27
39	Bromodichloromethane	83	6.341	6.341	(1.129)	189344	50.0000	53.85
66	Bromoform	173	8.976	8.976	(1.089)	82849	50.0000	45.91
6	Bromomethane	94	1.666	1.666	(0.341)	81741	50.0000	54.46
19	Carbon Disulfide	76	2.585	2.585	(0.529)	687616	100.000	113.99
34	Carbon Tetrachloride	117	4.984	4.984	(0.887)	163680	50.0000	47.80
59	Chlorobenzene	112	8.264	8.264	(1.003)	391696	50.0000	52.17
7	Chloroethane	64	1.749	1.749	(0.358)	113975	50.0000	56.50
28	Chloroform	83	4.650	4.650	(0.952)	278107	50.0000	59.22
3	Chloromethane	50	1.340	1.340	(0.274)	150367	50.0000	62.04
27	cis-1,2-Dichloroethene	96	4.279	4.279	(0.876)	169446	50.0000	56.89
46	cis-1,3-Dichloropropene	75	6.749	6.749	(1.202)	242661	50.0000	53.25
55	Dibromochloromethane	129	7.750	7.750	(0.940)	146729	50.0000	50.56
44	Dibromomethane	93	6.183	6.183	(1.101)	102559	50.0000	55.40
2	Dichlorodifluoromethane	85	1.205	1.205	(0.247)	173157	50.0000	59.64(M)
61	Ethylbenzene	106	8.361	8.361	(1.015)	195043	50.0000	51.91
91	Hexachlorobutadiene	225	12.054	12.054	(1.179)	59555	50.0000	46.41
67	Isopropylbenzene	105	9.115	9.115	(1.106)	559538	50.0000	49.45
62	m,p-Xylenes	106	8.463	8.463	(1.027)	487760	100.000	105.06
17	Methylene Chloride	84	2.866	2.866	(0.587)	154422	50.0000	53.75
87	n-Butylbenzene	91	10.547	10.547	(1.032)	410881	50.0000	49.85
73	n-Propylbenzene	91	9.467	9.467	(0.926)	666449	50.0000	52.01
92	Naphthalene	128	12.121	12.121	(1.186)	488960	50.0000	47.04
63	o-Xylene	106	8.800	8.800	(1.068)	241071	50.0000	52.42
81	sec-Butylbenzene	105	10.075	10.075	(0.985)	511520	50.0000	48.59
64	Styrene	104	8.815	8.815	(1.070)	437868	50.0000	55.45
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	369645	50.0000	47.28
56	Tetrachloroethene	164	7.514	7.514	(0.912)	99021	50.0000	45.59
50	Toluene	91	7.038	7.038	(0.854)	627026	50.0000	54.42
20	trans-1,2-Dichloroethene	96	3.136	3.136	(0.642)	135183	50.0000	55.13
51	trans-1,3-Dichloropropene	75	7.255	7.255	(1.292)	207730	50.0000	53.15
38	Trichloroethene	130	5.853	5.853	(1.042)	144048	50.0000	51.11
8	Trichlorofluoromethane	101	1.951	1.951	(0.399)	225958	50.0000	57.47
5	Vinyl Chloride	62	1.419	1.419	(0.290)	171333	50.0000	58.11

QC Flag Legend

M - Compound response manually integrated.

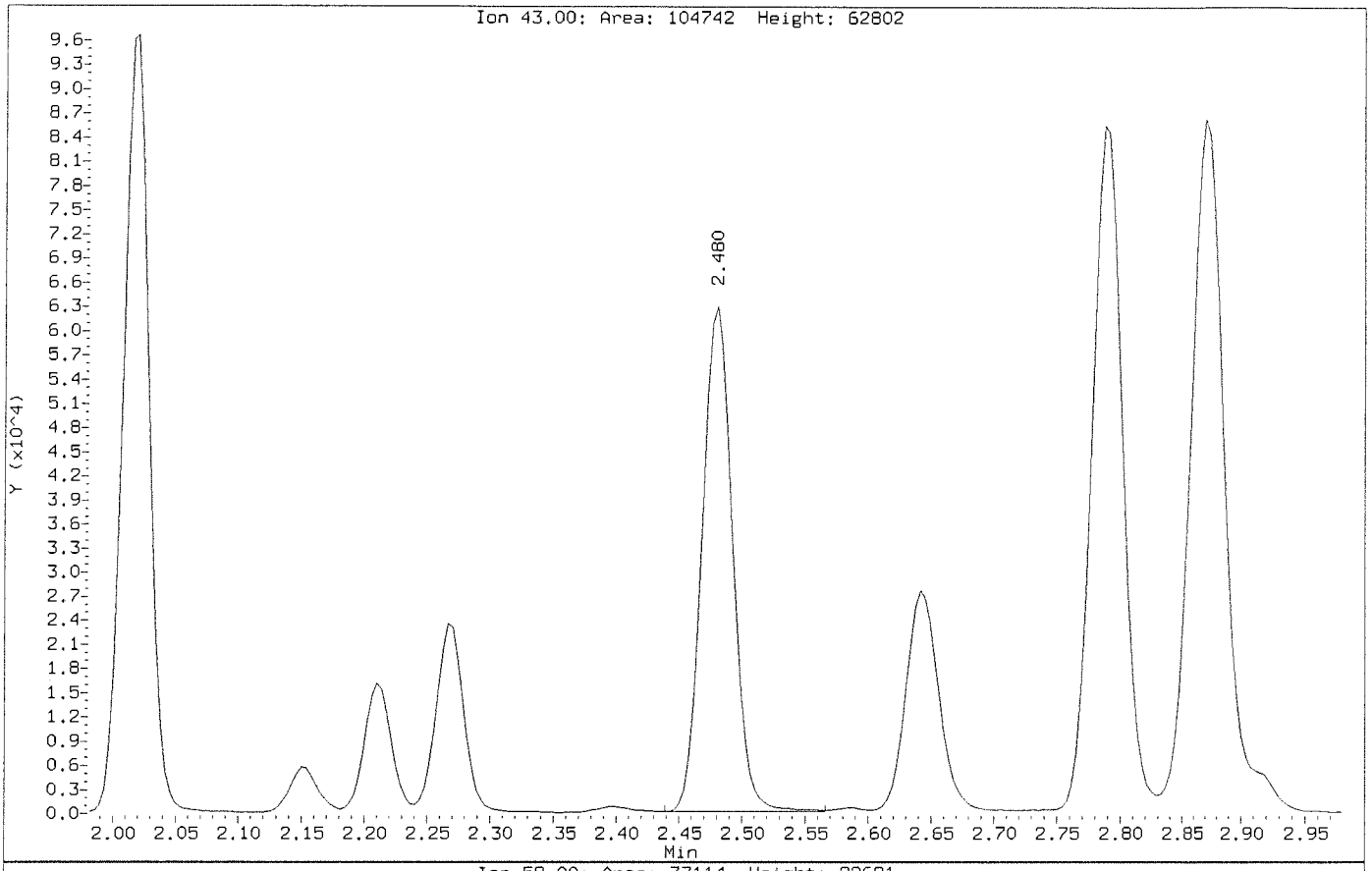


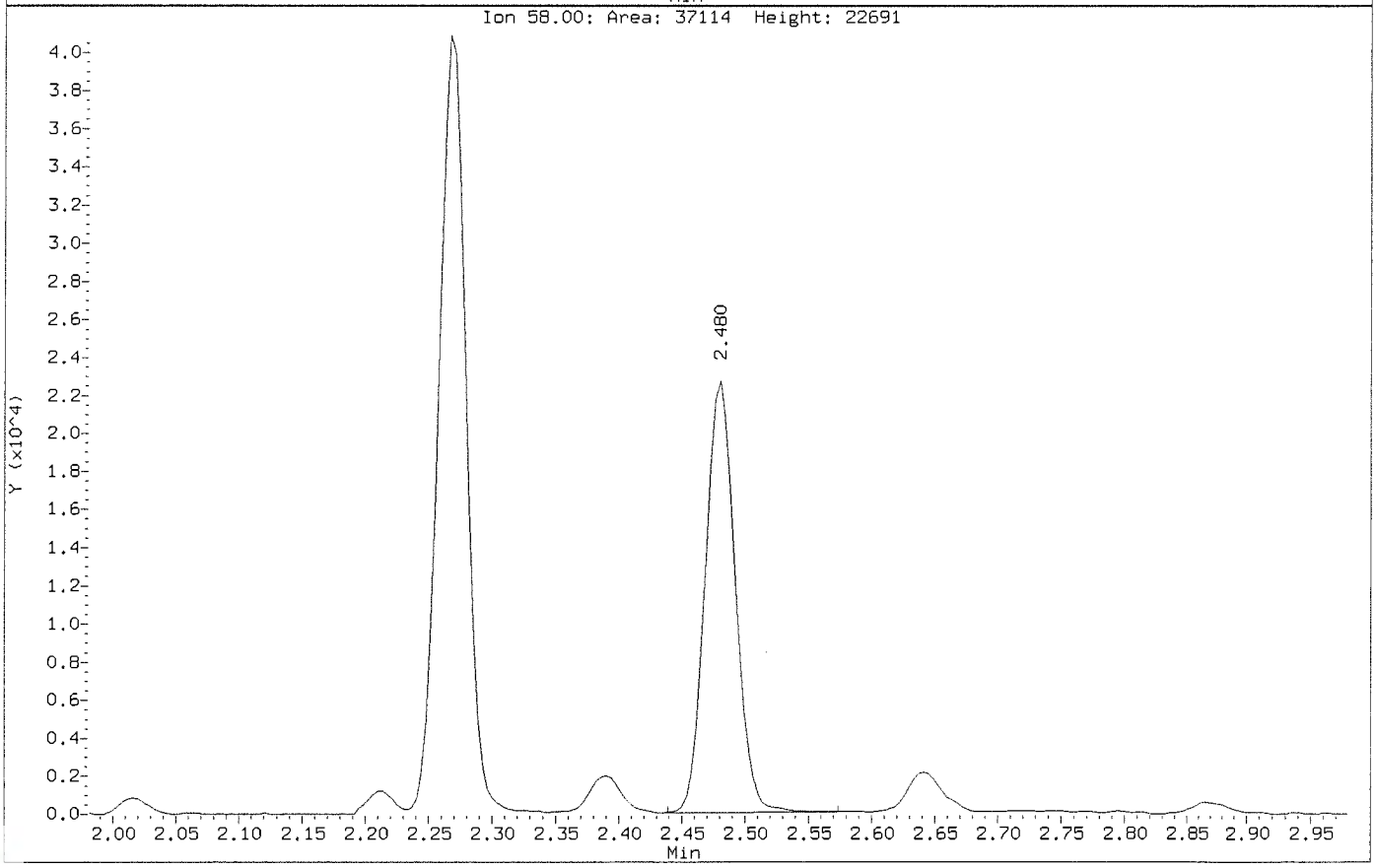
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Date : 15-DEC-2021 12:50
Client ID: CCV
Sample Info: VSTD050;VSTD050;2;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\before\U121503.D
Injection Date: 15-DEC-2021 12:50
Instrument: VOA9.i
Client Sample ID: CCV

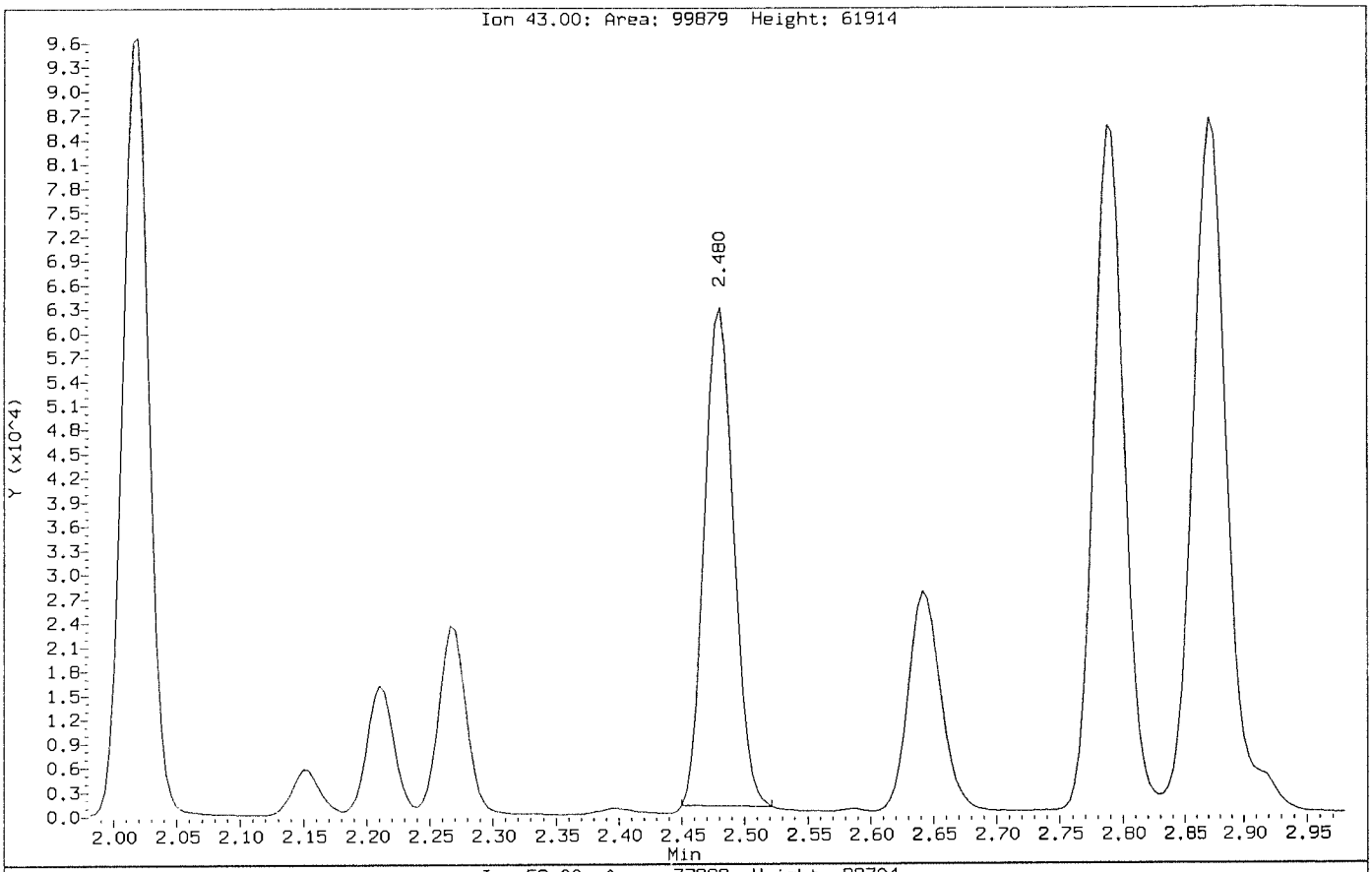
Compound: Acetone
CAS Number: 67-64-1

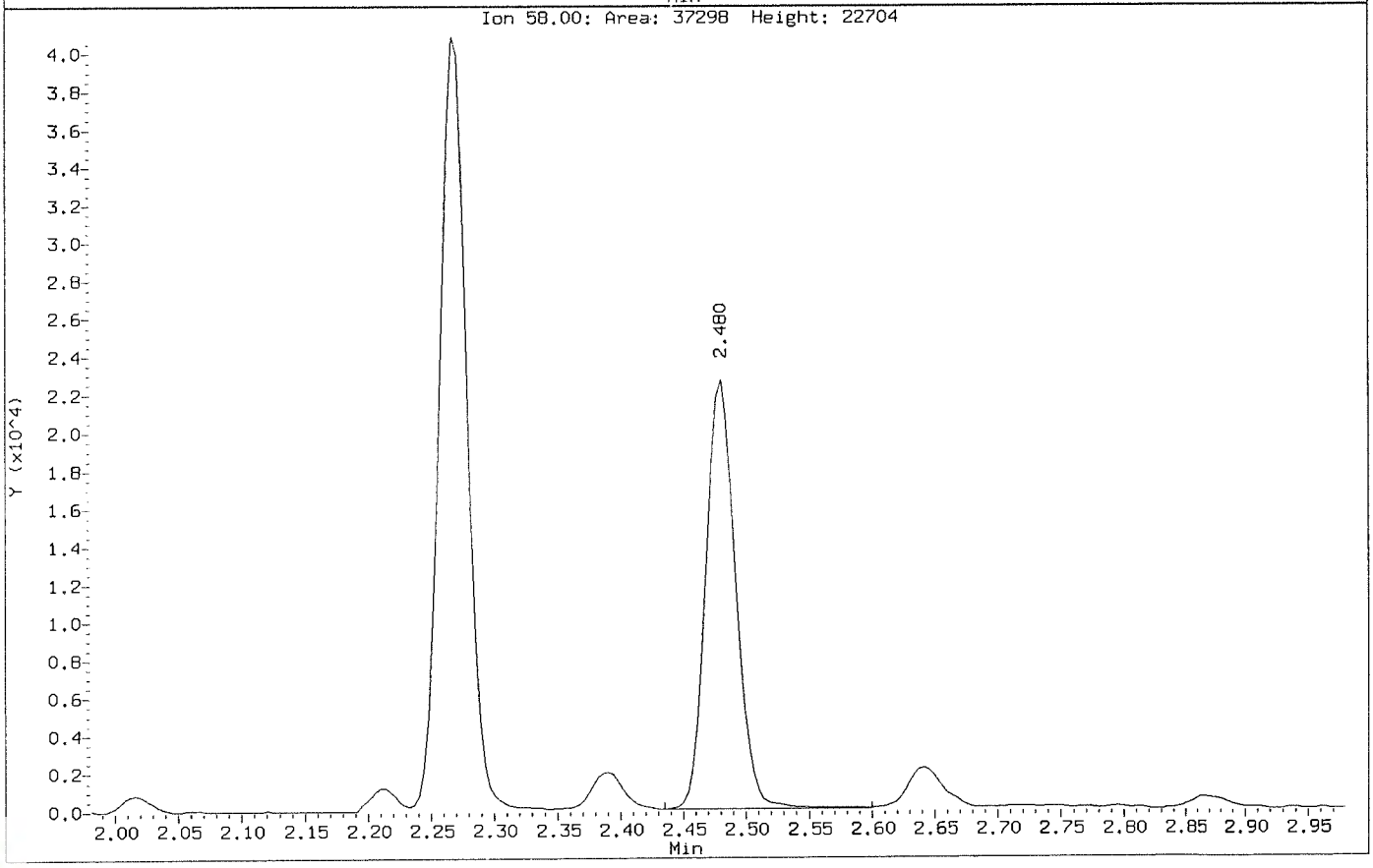




Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121503.D
Injection Date: 15-DEC-2021 12:50
Instrument: VOA9.i
Client Sample ID: CCV

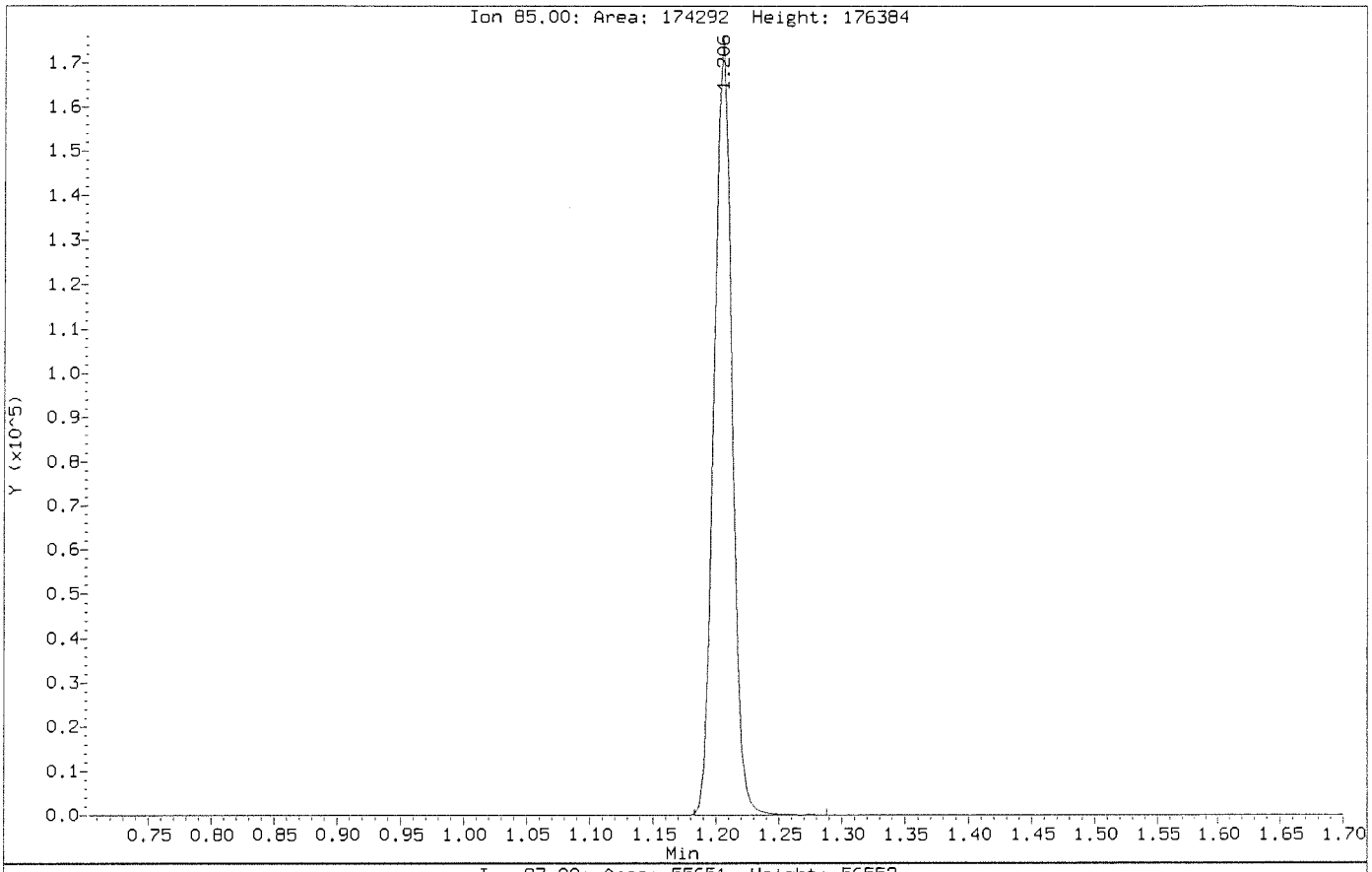
Compound: Acetone
CAS Number: 67-64-1

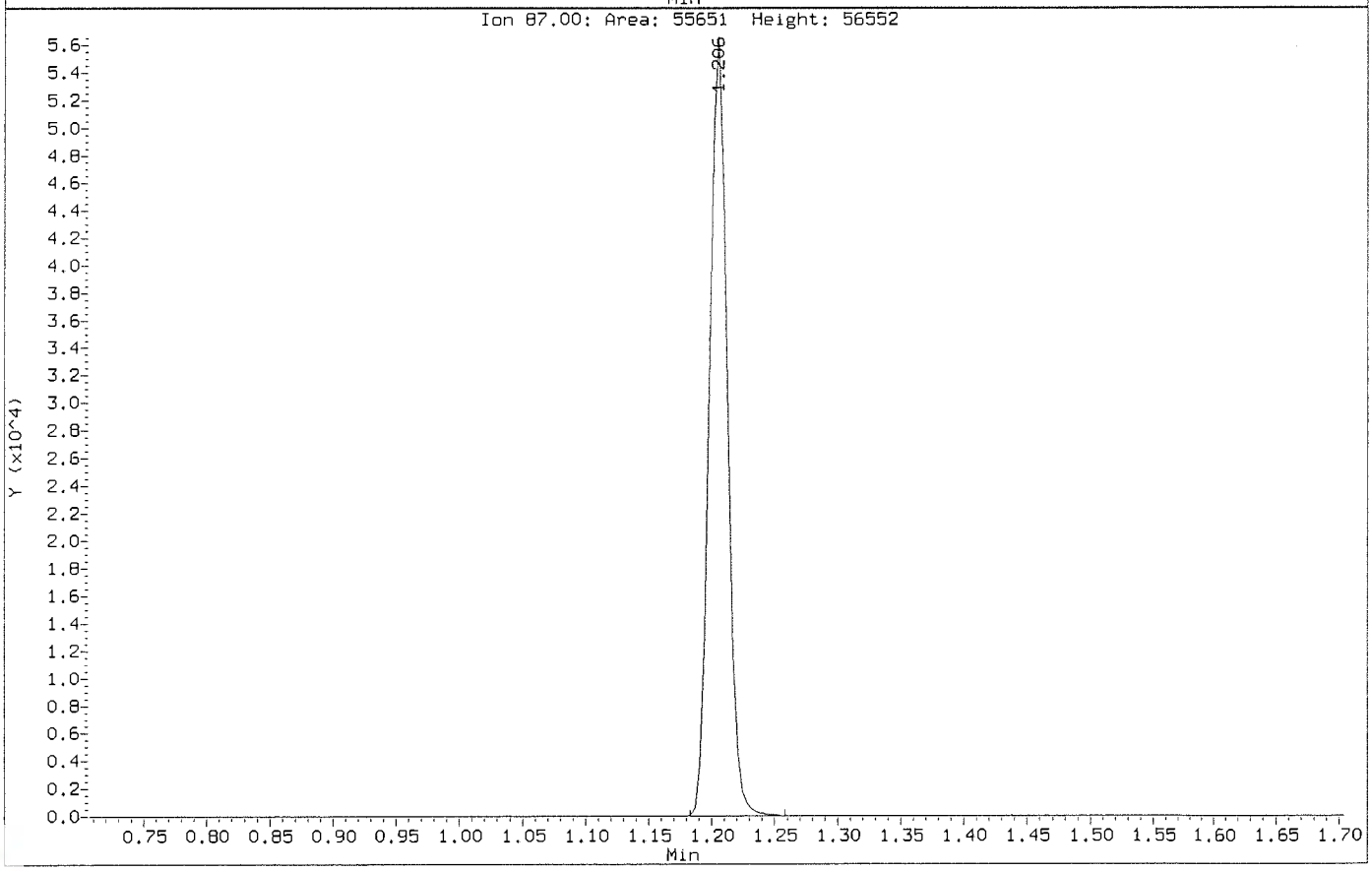




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Injection Date: 15-DEC-2021 12:50
Instrument: VOA9.i
Client Sample ID: CCV

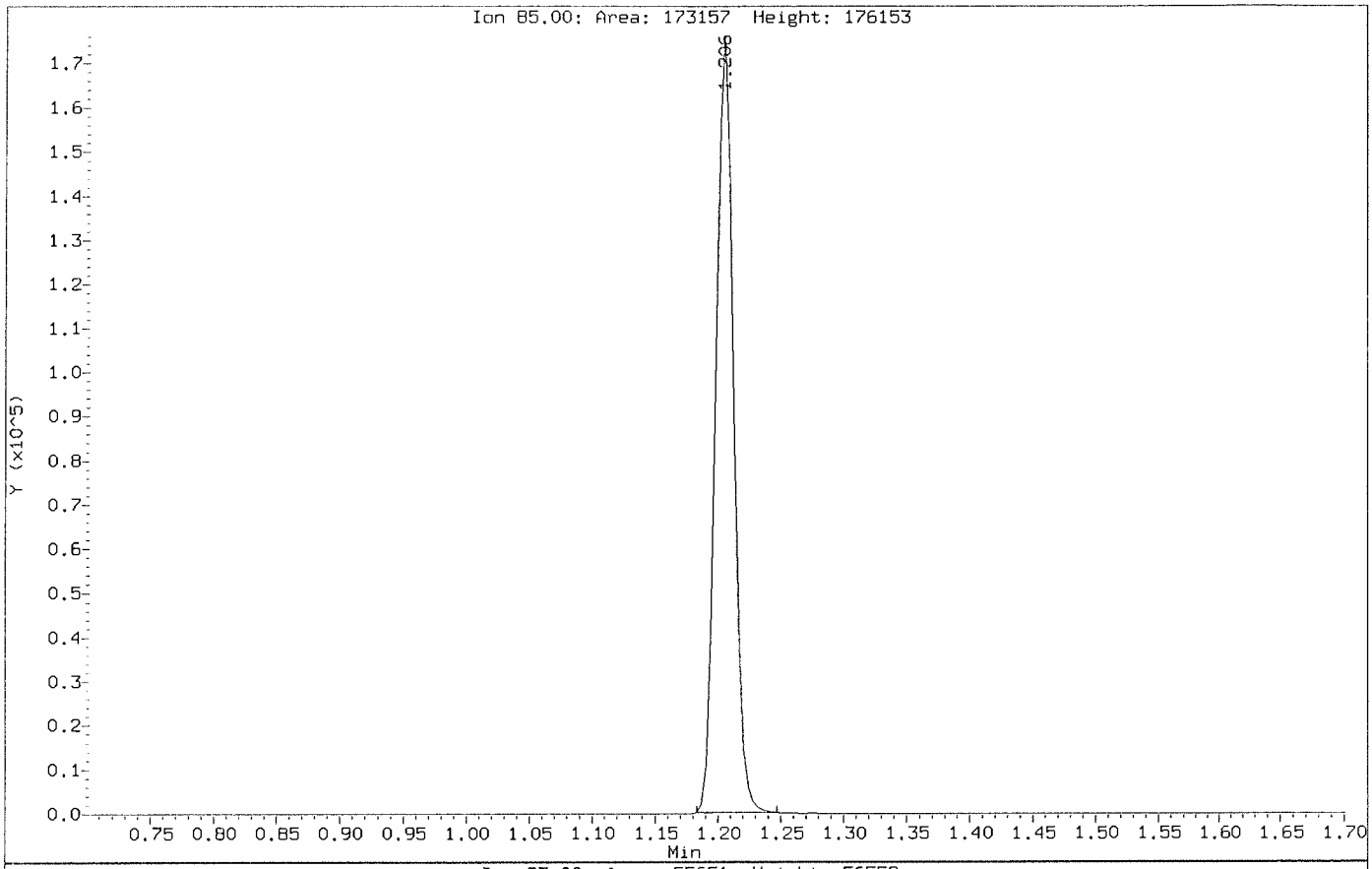
Compound: Dichlorodifluoromethane
CAS Number: 75-71-8

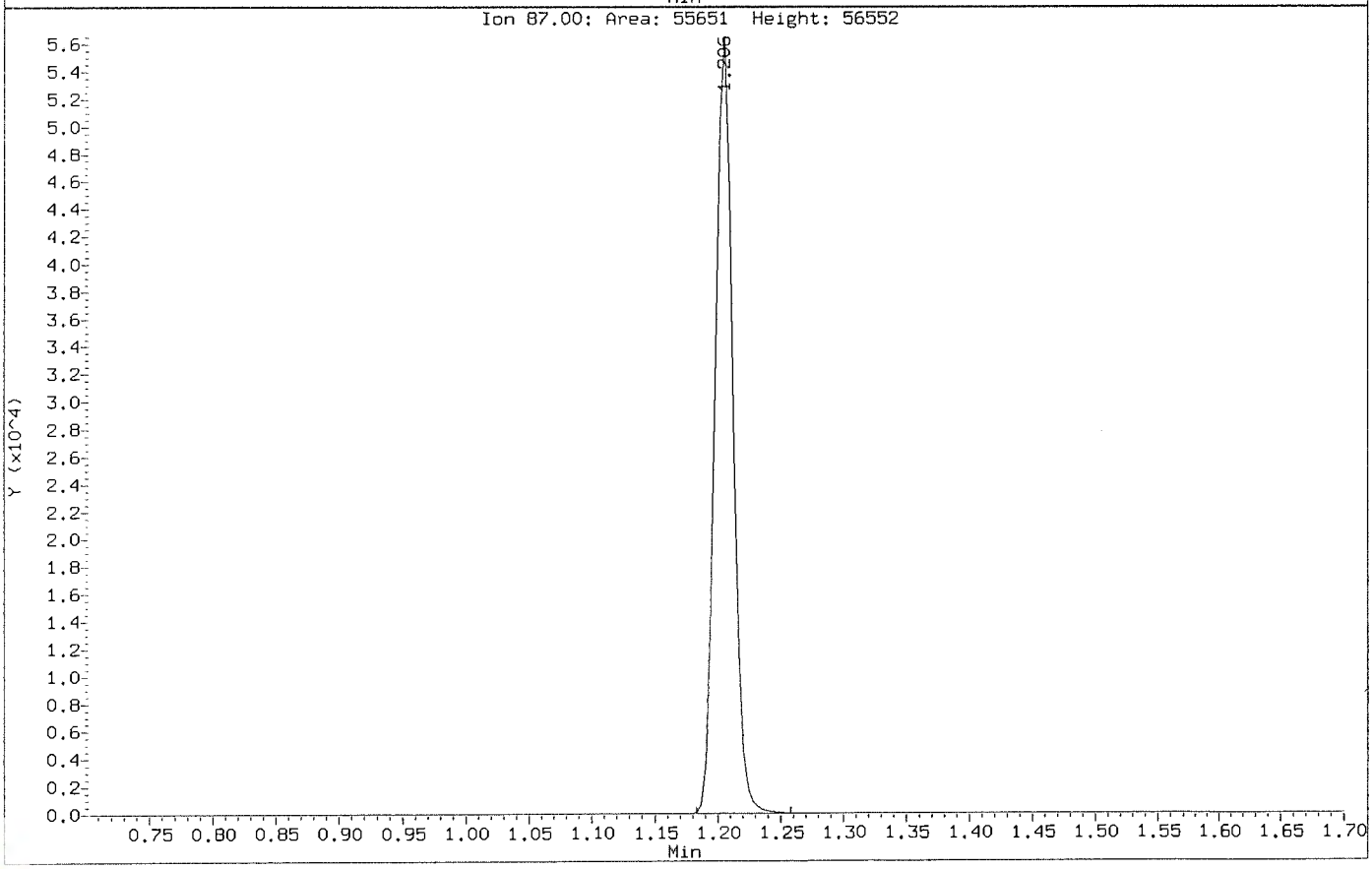




Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121503.D
Injection Date: 15-DEC-2021 12:50
Instrument: VOA9.i
Client Sample ID: CCV

Compound: Dichlorodifluoromethane
CAS Number: 75-71-8





Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121505.D Page 1
Report Date: 20-Dec-2021 14:53

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121505.D
Lab Smp Id: VLCSW-211215 Client Smp ID: VLSCW-211215
Inj Date : 15-DEC-2021 13:35
Operator : PC Inst ID: VOA9.i
Smp Info : VLCSW-211215;VLSCW-211215;3;;LCS
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211215.b\8260C.m
Meth Date : 20-Dec-2021 14:53 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 5 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

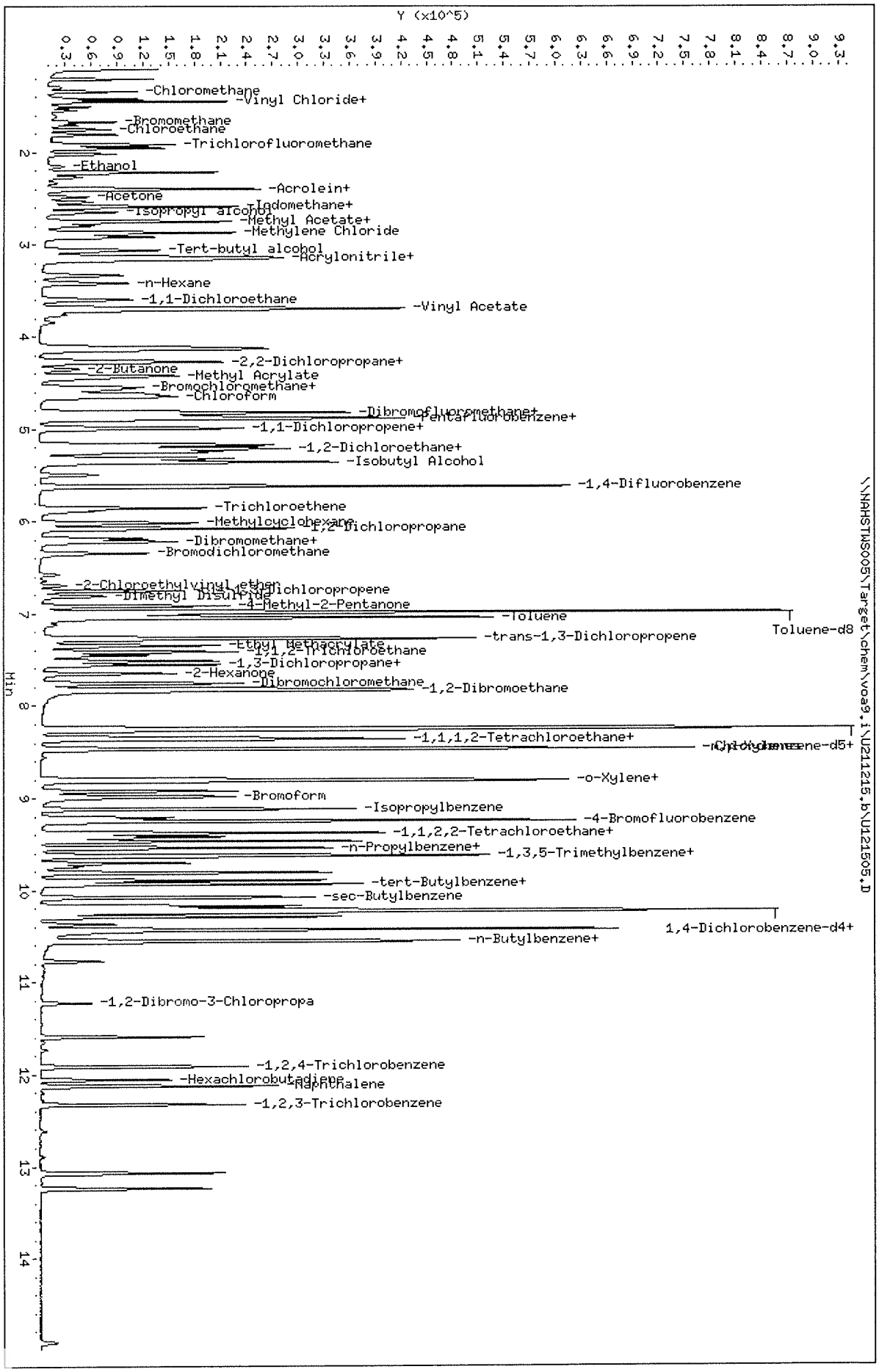
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.886	4.886	(1.000)	243343	50.0000	
* 36 1,4-Difluorobenzene	114	5.617	5.617	(1.000)	439776	50.0000	
* 47 Chlorobenzene-d5	117	8.241	8.241	(1.000)	392954	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.224	10.224	(1.000)	188975	50.0000	
$ 30 Dibromofluoromethane	113	4.822	4.823	(0.987)	137472	53.8868	53.88
$ 35 1,2-Dichloroethane-d4	65	5.171	5.171	(1.058)	172399	57.9815	57.98
$ 48 Toluene-d8	98	6.982	6.982	(0.847)	508341	49.7048	49.70
$ 69 4-Bromofluorobenzene	95	9.250	9.246	(1.122)	195012	51.1243	51.12
60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	51187	19.3049	19.30
31 1,1,1-Trichloroethane	97	4.819	4.819	(0.986)	75777	21.6320	21.63
68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	90818	22.8329	22.83
53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	52713	22.7654	22.76
22 1,1-Dichloroethane	63	3.593	3.597	(0.735)	103269	23.8873	23.88
11 1,1-Dichloroethene	96	2.397	2.397	(0.491)	45563	21.0010	21.00
32 1,1-Dichloropropene	75	4.995	4.995	(0.889)	75678	20.9554	20.95
93 1,2,3-Trichlorobenzene	180	12.323	12.324	(1.205)	60911	17.9986	17.99
71 1,2,3-Trichloropropane	75	9.418	9.418	(0.921)	84458	21.6264	21.62
90 1,2,4-Trichlorobenzene	180	11.915	11.911	(1.165)	63904	18.3726	18.37
79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	193559	20.4309	20.43
89 1,2-Dibromo-3-Chloropropane	155	11.221	11.222	(1.098)	9783	16.5811	16.58
57 1,2-Dibromoethane	107	7.844	7.844	(0.952)	62436	22.1974	22.19
88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	108037	20.2731	20.27

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121505.D Page 2
Report Date: 20-Dec-2021 14:53

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
33 1,2-Dichloroethane	62	5.246	5.246	(0.934)	89256	22.4981	22.49
42 1,2-Dichloropropane	63	6.074	6.075	(1.081)	62973	22.7564	22.75
75 1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	181952	19.5836	19.58
83 1,3-Dichlorobenzene	146	10.172	10.168	(0.995)	107813	19.8087	19.80
54 1,3-Dichloropropane	76	7.555	7.555	(0.917)	110627	22.4215	22.42
84 1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	112205	20.0350	20.03
26 2,2-Dichloropropane	77	4.264	4.264	(0.873)	55820	22.7825	22.78
24 2-Butanone	43	4.350	4.347	(0.890)	54260	42.6424	42.64
76 2-Chlorotoluene	91	9.538	9.538	(0.933)	173659	21.3405	21.34
52 2-Hexanone	43	7.649	7.645	(0.928)	85569	45.8725	45.87
77 4-Chlorotoluene	91	9.632	9.628	(0.942)	202749	21.4993	21.49
82 p-Isopropyltoluene	119	10.202	10.202	(0.998)	173149	18.8018	18.80
45 4-Methyl-2-Pentanone	43	6.914	6.914	(0.839)	120507	42.5815	42.58
10 Acetone	43	2.479	2.480	(0.507)	46497	51.7532	51.75
37 Benzene	78	5.208	5.209	(0.927)	244057	21.9472	21.94
74 Bromobenzene	156	9.373	9.374	(0.917)	60626	20.6874	20.68
29 Bromochloromethane	128	4.549	4.549	(0.931)	30902	22.5134	22.51
39 Bromodichloromethane	83	6.341	6.341	(1.129)	70034	20.2001	20.20
66 Bromoform	173	8.976	8.976	(1.089)	28155	16.4589	16.45
6 Bromomethane	94	1.666	1.666	(0.341)	35677	23.5245	23.52
19 Carbon Disulfide	76	2.584	2.585	(0.529)	261769	43.4721	43.47
34 Carbon Tetrachloride	117	4.983	4.984	(0.887)	61078	18.4533	18.45
59 Chlorobenzene	112	8.267	8.264	(1.003)	157274	20.5302	20.53
7 Chloroethane	64	1.748	1.749	(0.358)	45658	22.6750	22.67(M)
28 Chloroform	83	4.650	4.650	(0.952)	111884	23.8695	23.86
3 Chloromethane	50	1.340	1.340	(0.274)	62555	25.5164	25.51
27 cis-1,2-Dichloroethene	96	4.279	4.279	(0.876)	66120	22.2398	22.23
46 cis-1,3-Dichloropropene	75	6.753	6.749	(1.202)	86033	19.6565	19.65
55 Dibromochloromethane	129	7.750	7.750	(0.940)	52391	18.6700	18.66
44 Dibromomethane	93	6.183	6.183	(1.101)	42022	22.2648	22.26
2 Dichlorodifluoromethane	85	1.205	1.205	(0.247)	66389	22.4711	22.47
61 Ethylbenzene	106	8.361	8.361	(1.015)	76238	19.8848	19.88
91 Hexachlorobutadiene	225	12.054	12.054	(1.179)	24861	19.3390	19.33
67 Isopropylbenzene	105	9.118	9.115	(1.106)	217813	18.8674	18.86
62 m,p-Xylenes	106	8.462	8.463	(1.027)	193284	40.8015	40.80
17 Methylene Chloride	84	2.865	2.866	(0.587)	63178	22.0312	22.03
87 n-Butylbenzene	91	10.547	10.547	(1.032)	163189	19.7632	19.76
73 n-Propylbenzene	91	9.467	9.467	(0.926)	262603	20.4596	20.45
92 Naphthalene	128	12.121	12.121	(1.186)	187956	18.0517	18.05
63 o-Xylene	106	8.803	8.800	(1.068)	95964	20.4528	20.45
81 sec-Butylbenzene	105	10.078	10.075	(0.986)	196736	18.6564	18.65
64 Styrene	104	8.815	8.815	(1.070)	171790	21.3220	21.32
78 tert-Butylbenzene	119	9.891	9.891	(0.967)	143421	18.3123	18.31
56 Tetrachloroethene	164	7.514	7.514	(0.912)	38806	17.5106	17.51
50 Toluene	91	7.038	7.038	(0.854)	250119	21.2762	21.27
20 trans-1,2-Dichloroethene	96	3.135	3.136	(0.642)	53857	22.0058	22.00
51 trans-1,3-Dichloropropene	75	7.255	7.255	(1.292)	70480	19.1001	19.10
38 Trichloroethene	130	5.853	5.853	(1.042)	57255	19.9284	19.92
8 Trichlorofluoromethane	101	1.951	1.951	(0.399)	87408	22.2731	22.27
5 Vinyl Chloride	62	1.418	1.419	(0.290)	66088	22.4558	22.45

QC Flag Legend

M - Compound response manually integrated.



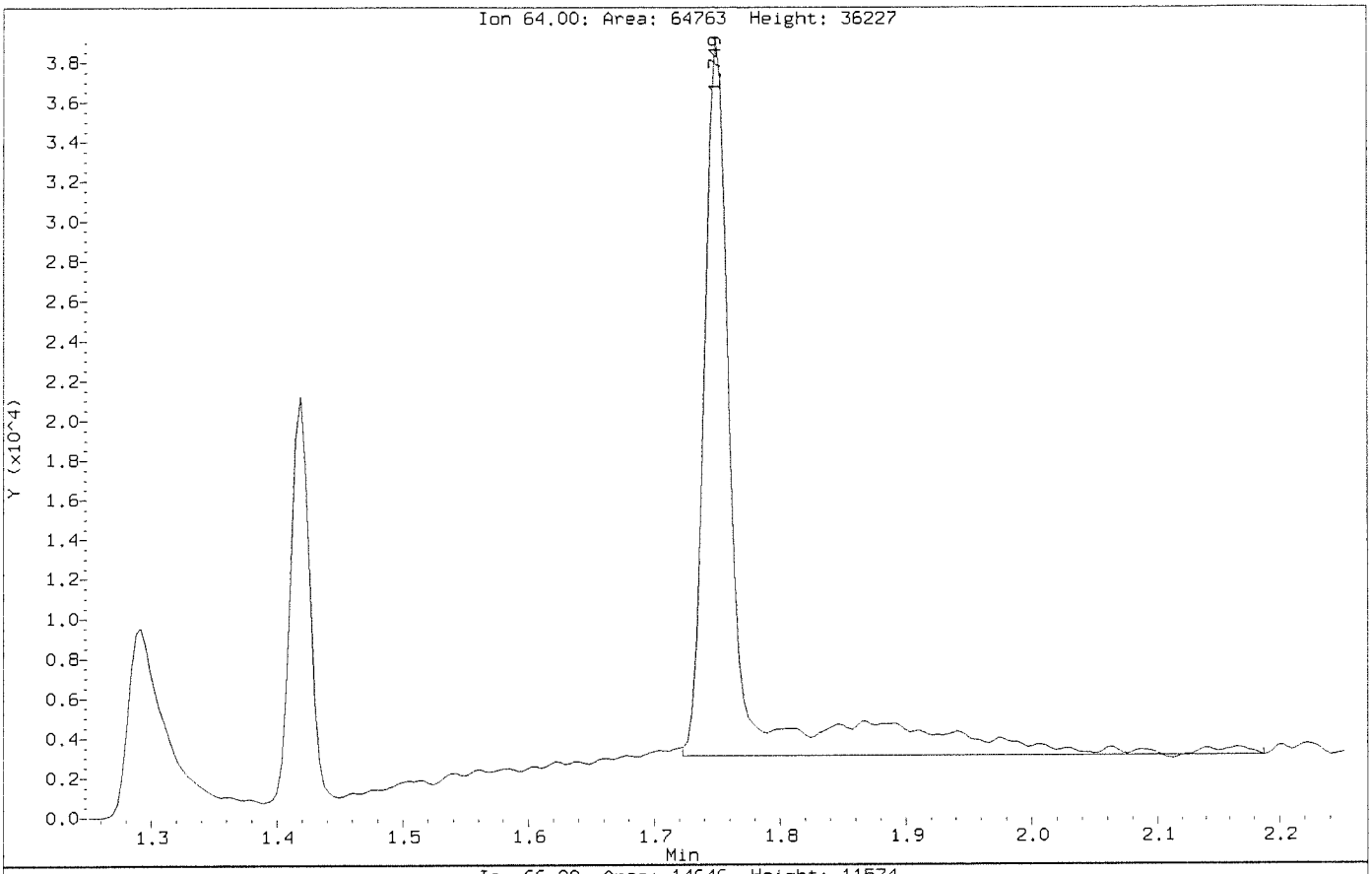
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Sample Info: VLCSW-211215;VLSCW-211215;3;;LCS
Purge Volume: 5.0
Column phase: DB624

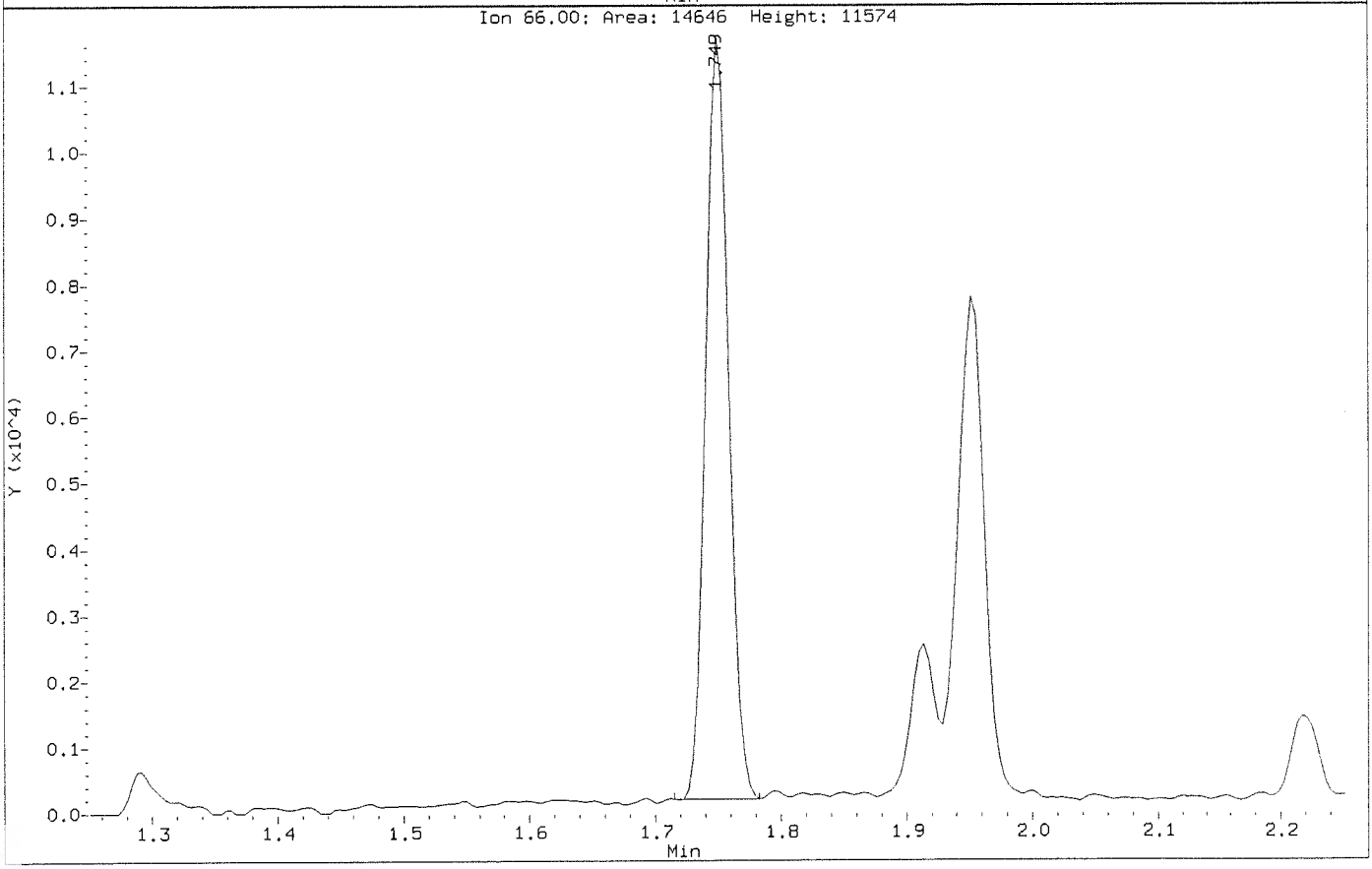
Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

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Injection Date: 15-DEC-2021 13:35
Instrument: VOA9.i
Client Sample ID: VLSCW-211215

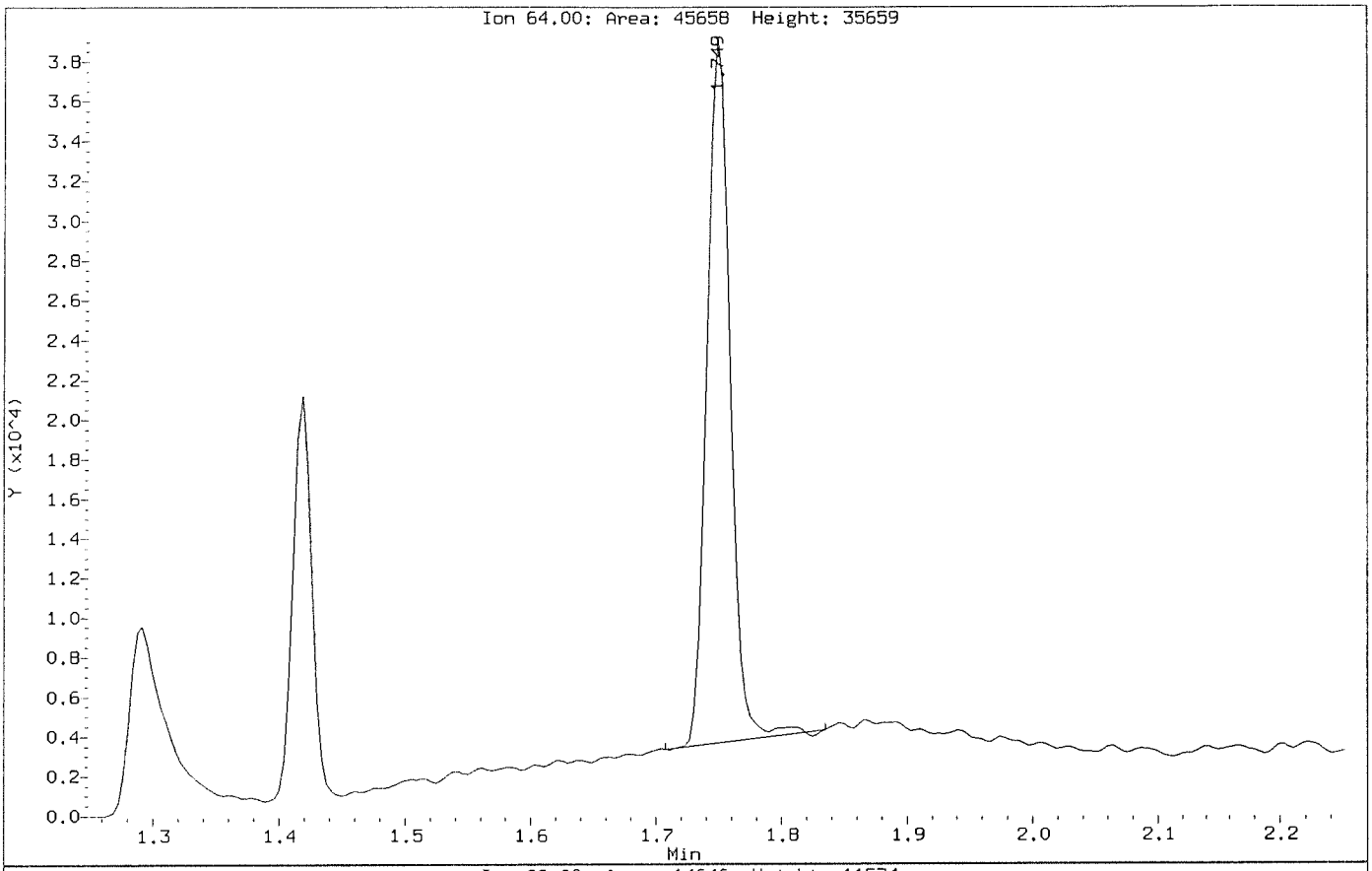
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CAS Number: 75-00-3

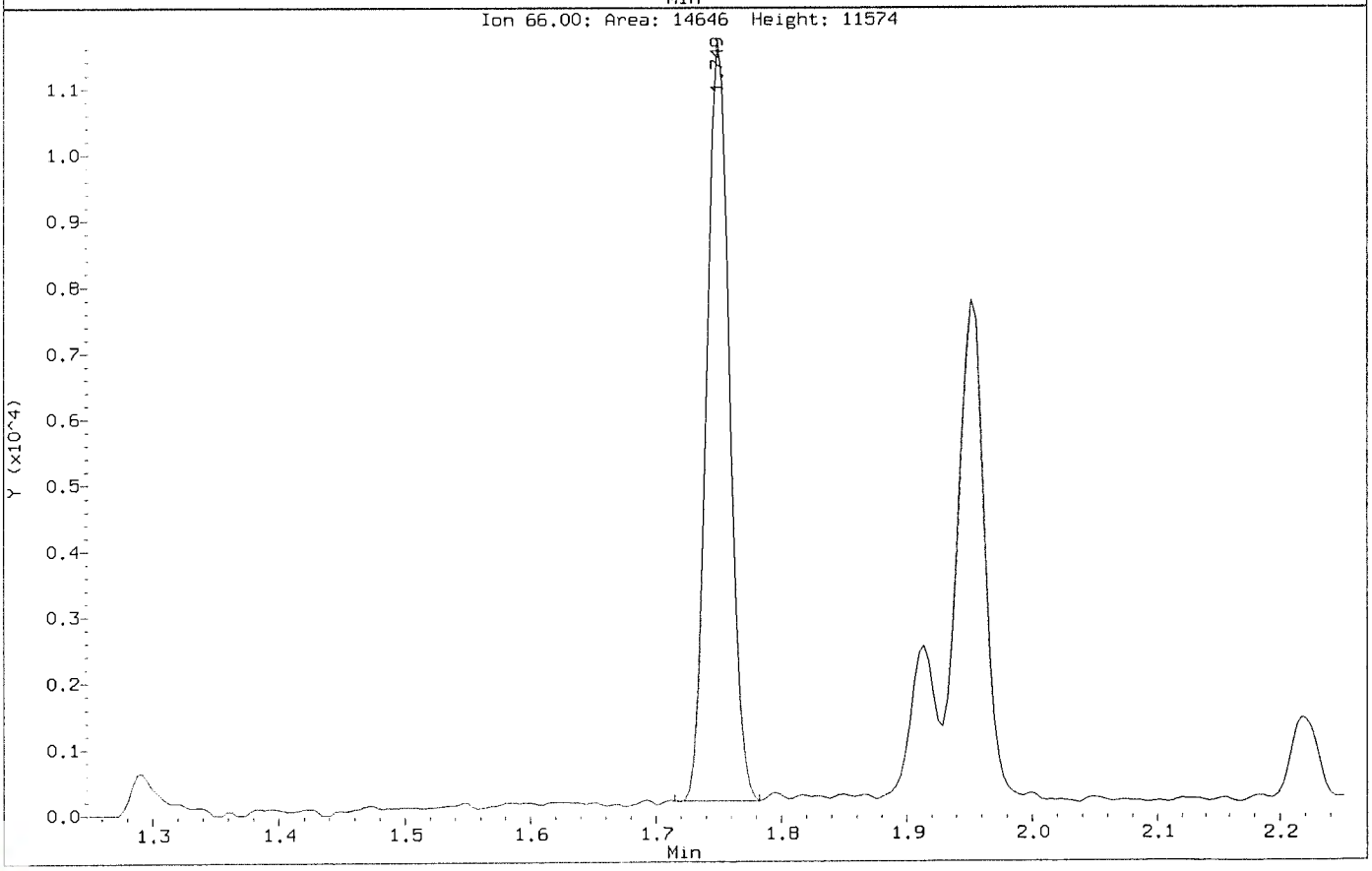




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Injection Date: 15-DEC-2021 13:35
Instrument: VOA9.i
Client Sample ID: VLSCW-211215

Compound: Chloroethane
CAS Number: 75-00-3





Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121507.D Page 1
Report Date: 20-Dec-2021 14:53

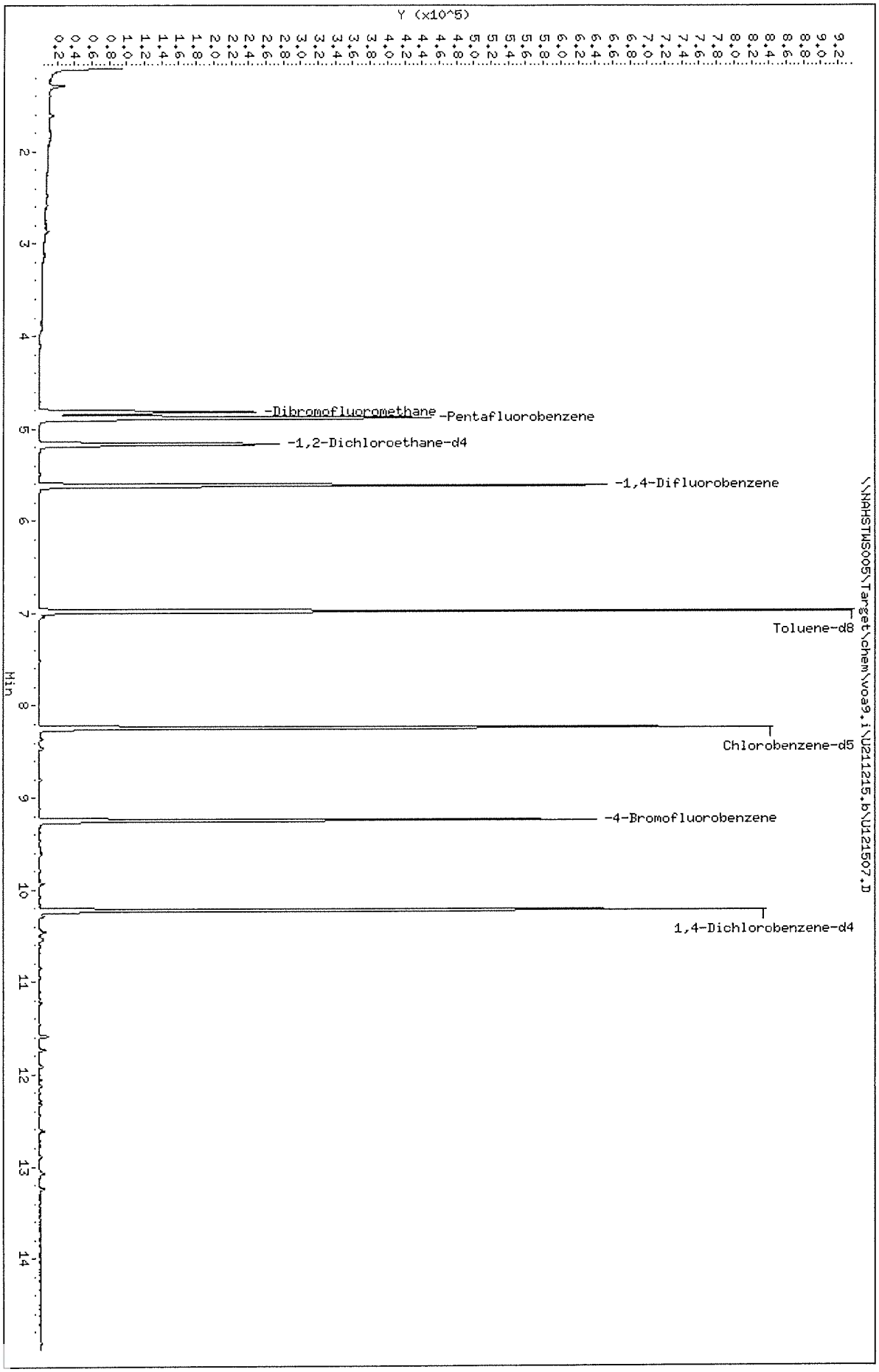
ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121507.D
Lab Smp Id: VBLKW-211215 Client Smp ID: VBLKW-211215
Inj Date : 15-DEC-2021 14:20
Operator : PC Inst ID: VOA9.i
Smp Info : VBLKW-211215;VBLKW-211215;3;;BLANK
Misc Info : 180315V9;WATER;0;1;
Comment   :
Method   : \\nahstws005\Target\chem\voa9.i\U211215.b\8260C.m
Meth Date : 20-Dec-2021 14:53 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 7 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.886	4.886	(1.000)	270515	50.0000	
* 36 1,4-Difluorobenzene	114	5.617	5.617	(1.000)	463348	50.0000	
* 47 Chlorobenzene-d5	117	8.241	8.241	(1.000)	407848	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.224	10.224	(1.000)	191512	50.0000	
$ 30 Dibromofluoromethane	113	4.822	4.823	(0.987)	141934	49.9864	49.98
$ 35 1,2-Dichloroethane-d4	65	5.167	5.171	(1.058)	175499	52.9690	52.96
$ 48 Toluene-d8	98	6.978	6.982	(0.847)	554071	52.1977	52.19
$ 69 4-Bromofluorobenzene	95	9.250	9.246	(1.122)	201322	50.8439	50.84



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121507.D
Date : 15-DEC-2021 14:20
Client ID: VBLKW-211215
Sample Info: VBLKW-211215;VBLKW-211215;3;;BLANK
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

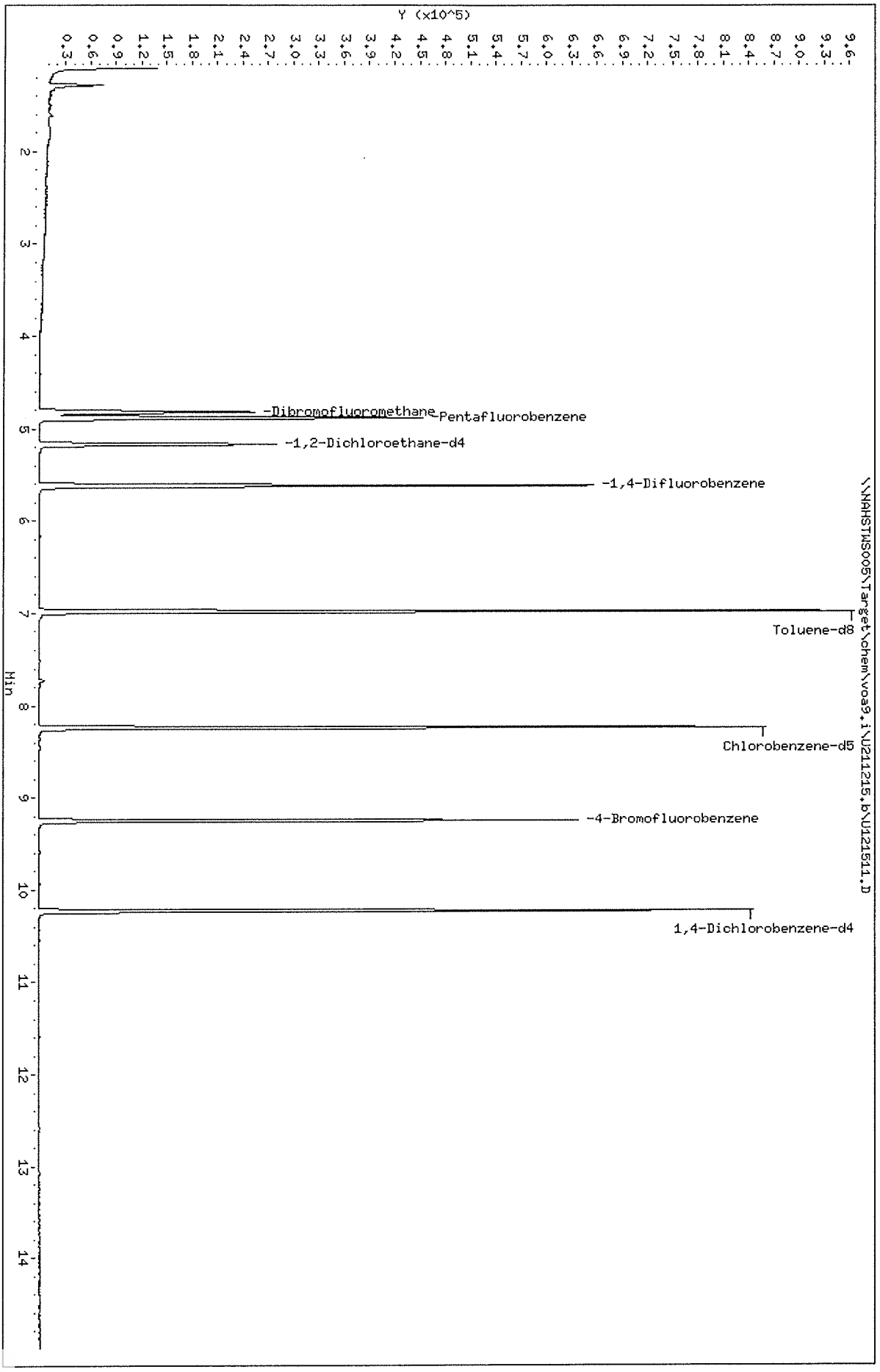
ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121511.D
Lab Smp Id: HS21120243-02 Client Smp ID: HS21120243-02
Inj Date : 15-DEC-2021 15:49
Operator : PC Inst ID: VOA9.i
Smp Info : HS21120243-02;HS21120243-02;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211215.b\8260C.m
Meth Date : 20-Dec-2021 14:47 kori.bagsb Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 11
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.883	4.886	(1.000)	268891	50.0000	
* 36 1,4-Difluorobenzene	114	5.614	5.617	(1.000)	467534	50.0000	
* 47 Chlorobenzene-d5	117	8.242	8.241	(1.000)	418458	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.225	10.224	(1.000)	192001	50.0000	
$ 30 Dibromofluoromethane	113	4.819	4.823	(0.987)	143782	50.9594	50.95
$ 35 1,2-Dichloroethane-d4	65	5.168	5.167	(1.058)	178652	54.2825	54.28
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	560944	51.5053	51.50
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	204336	50.2822	50.28



Data File: \\NAHSTWS005\Target\chem\voa9,i\U211215,b\U121511.D
Date : 15-DEC-2021 15:49
Client ID: HS21120243-02
Sample Info: HS21120243-02;HS21120243-02;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121513.D Page 1
Report Date: 20-Dec-2021 14:53

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121513.D
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Inj Date : 15-DEC-2021 16:34
Operator : PC Inst ID: VOA9.i
Smp Info : HS21120243-02MS;HS21120243-02MS;3;;MS
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211215.b\8260C.m
Meth Date : 20-Dec-2021 14:53 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 13 QC Sample: MS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

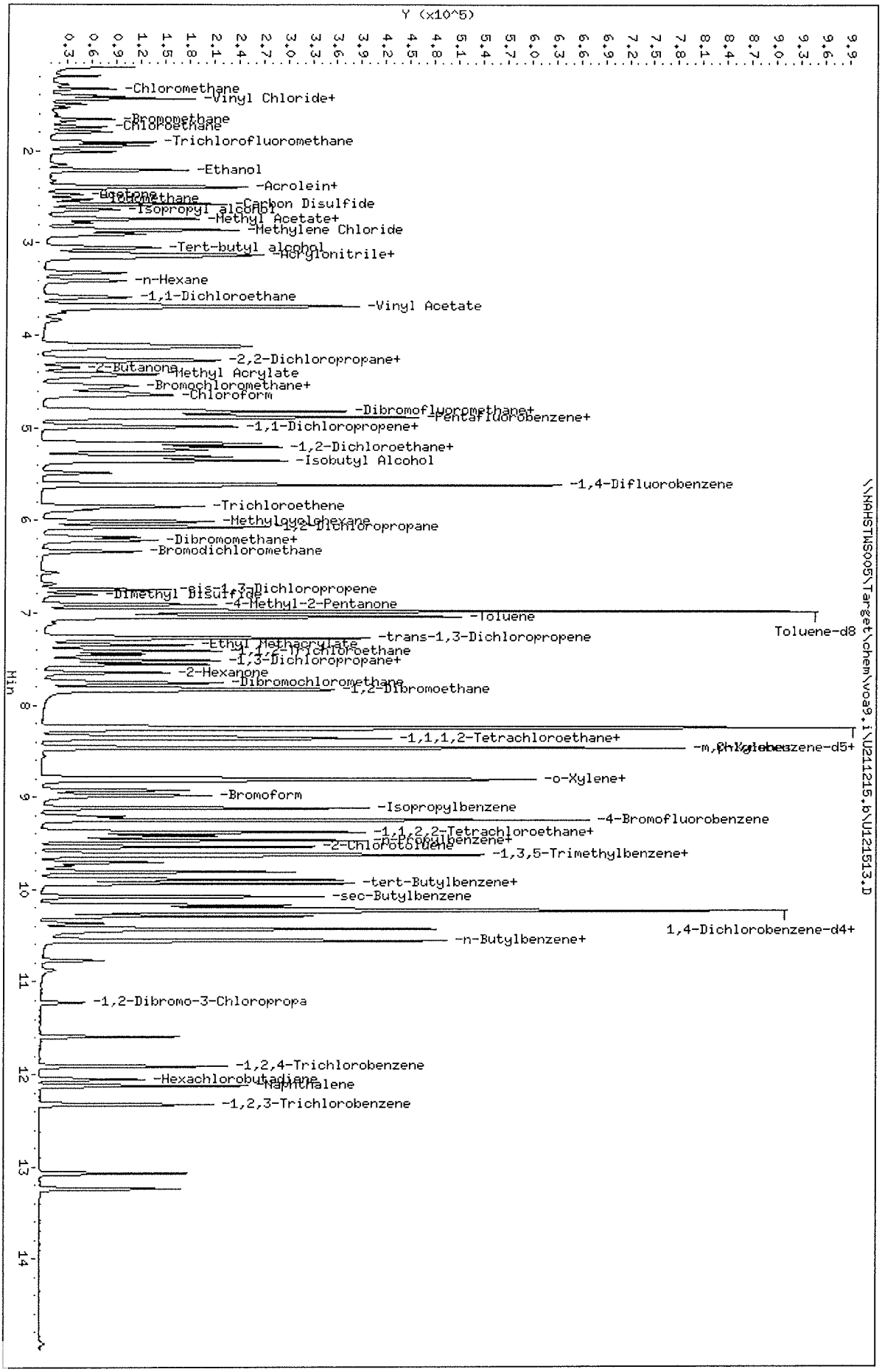
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.883	4.886	(1.000)	265832	50.0000	
* 36 1,4-Difluorobenzene	114	5.614	5.617	(1.000)	453721	50.0000	
* 47 Chlorobenzene-d5	117	8.242	8.241	(1.000)	400941	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.225	10.224	(1.000)	200113	50.0000	
$ 30 Dibromofluoromethane	113	4.819	4.823	(0.987)	141207	50.6170	50.61
$ 35 1,2-Dichloroethane-d4	65	5.164	5.171	(1.058)	171590	52.6940	52.69
$ 48 Toluene-d8	98	6.978	6.982	(0.847)	551445	52.8453	52.84
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	208693	53.6867	53.68
60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	50803	18.8009	18.80
31 1,1,1-Trichloroethane	97	4.812	4.819	(0.985)	78828	20.5992	20.59
68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	89859	21.3343	21.33
53 1,1,2-Trichloroethane	83	7.409	7.413	(0.899)	51371	21.7439	21.74
22 1,1-Dichloroethane	63	3.586	3.597	(0.734)	104855	22.2023	22.20
11 1,1-Dichloroethene	96	2.386	2.397	(0.489)	46253	19.5155	19.51
32 1,1-Dichloropropene	75	4.988	4.995	(0.888)	78686	21.1186	21.11
93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	56253	15.6970	15.69
71 1,2,3-Trichloropropane	75	9.415	9.418	(0.921)	84789	20.5027	20.50
90 1,2,4-Trichlorobenzene	180	11.912	11.911	(1.165)	58829	15.9721	15.97
79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	197580	19.6946	19.69
89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	9061	14.8078	14.80
57 1,2-Dibromoethane	107	7.840	7.844	(0.951)	60250	20.9935	20.99
88 1,2-Dichlorobenzene	146	10.558	10.562	(1.033)	106085	18.7988	18.79

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121513.D Page 2
Report Date: 20-Dec-2021 14:53

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
33	1,2-Dichloroethane	62	5.243	5.246	(0.934)	89521	21.8713	21.87
42	1,2-Dichloropropane	63	6.071	6.075	(1.081)	63927	22.3912	22.39
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	191965	19.5113	19.51
83	1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	105705	18.3404	18.34
54	1,3-Dichloropropane	76	7.556	7.555	(0.917)	111886	22.2249	22.22
84	1,4-Dichlorobenzene	146	10.243	10.247	(1.002)	111699	18.8346	18.83
26	2,2-Dichloropropane	77	4.257	4.264	(0.872)	54864	20.4980	20.49
24	2-Butanone	43	4.347	4.347	(0.890)	52974	38.1097	38.10
76	2-Chlorotoluene	91	9.535	9.538	(0.933)	176033	20.4282	20.42
52	2-Hexanone	43	7.646	7.645	(0.928)	82350	43.2674	43.26
77	4-Chlorotoluene	91	9.629	9.628	(0.942)	207285	20.7569	20.75
82	p-Isopropyltoluene	119	10.202	10.202	(0.998)	183834	18.8510	18.85
45	4-Methyl-2-Pentanone	43	6.911	6.914	(0.839)	118363	40.9908	40.99
10	Acetone	43	2.472	2.480	(0.506)	39863	39.1877	39.18
37	Benzene	78	5.205	5.209	(0.927)	246835	21.5148	21.51
74	Bromobenzene	156	9.374	9.374	(0.917)	59534	19.1841	19.18
29	Bromochloromethane	128	4.542	4.549	(0.930)	31058	20.7129	20.71
39	Bromodichloromethane	83	6.337	6.341	(1.129)	69172	19.3825	19.38
66	Bromoform	173	8.973	8.976	(1.089)	26500	15.3012	15.30
6	Bromomethane	94	1.655	1.666	(0.339)	35308	21.2634	21.26
19	Carbon Disulfide	76	2.577	2.585	(0.528)	258799	39.3429	39.34
34	Carbon Tetrachloride	117	4.976	4.984	(0.886)	63814	18.6682	18.66
59	Chlorobenzene	112	8.264	8.264	(1.003)	156688	20.0462	20.04
7	Chloroethane	64	1.738	1.749	(0.356)	42435	19.2915	19.29(M)
28	Chloroform	83	4.647	4.650	(0.952)	111090	21.6951	21.69
3	Chloromethane	50	1.329	1.340	(0.272)	49378	18.2750	18.27
27	cis-1,2-Dichloroethene	96	4.272	4.279	(0.875)	69568	21.4200	21.41
46	cis-1,3-Dichloropropene	75	6.750	6.749	(1.202)	81542	18.1996	18.19
55	Dibromochloromethane	129	7.747	7.750	(0.940)	49354	17.3524	17.35
44	Dibromomethane	93	6.180	6.183	(1.101)	40643	20.8723	20.87
2	Dichlorodifluoromethane	85	1.194	1.205	(0.245)	29965	8.86652	8.86
61	Ethylbenzene	106	8.362	8.361	(1.015)	79491	20.3203	20.32
91	Hexachlorobutadiene	225	12.054	12.054	(1.179)	21043	15.4580	15.45
67	Isopropylbenzene	105	9.115	9.115	(1.106)	236845	20.1073	20.10
62	m,p-Xylenes	106	8.463	8.463	(1.027)	198982	41.1675	41.16
17	Methylene Chloride	84	2.858	2.866	(0.585)	62082	19.8175	19.81
87	n-Butylbenzene	91	10.547	10.547	(1.032)	170256	19.4714	19.47
73	n-Propylbenzene	91	9.467	9.467	(0.926)	284282	20.9158	20.91
92	Naphthalene	128	12.121	12.121	(1.186)	177432	16.0925	16.09
63	o-Xylene	106	8.800	8.800	(1.068)	96786	20.2171	20.21
81	sec-Butylbenzene	105	10.078	10.075	(0.986)	216378	19.3770	19.37
64	Styrene	104	8.815	8.815	(1.070)	168578	20.5065	20.50
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	159038	19.1761	19.17
56	Tetrachloroethene	164	7.514	7.514	(0.912)	41043	18.1510	18.15
50	Toluene	91	7.038	7.038	(0.854)	254778	21.2408	21.24
20	trans-1,2-Dichloroethene	96	3.125	3.136	(0.640)	53550	20.0293	20.02
51	trans-1,3-Dichloropropene	75	7.252	7.255	(1.292)	65640	17.4473	17.44
38	Trichloroethene	130	5.850	5.853	(1.042)	58196	19.6334	19.63
8	Trichlorofluoromethane	101	1.940	1.951	(0.397)	82202	19.1745	19.17
5	Vinyl Chloride	62	1.408	1.419	(0.288)	55532	17.2727	17.27

QC Flag Legend

M - Compound response manually integrated.

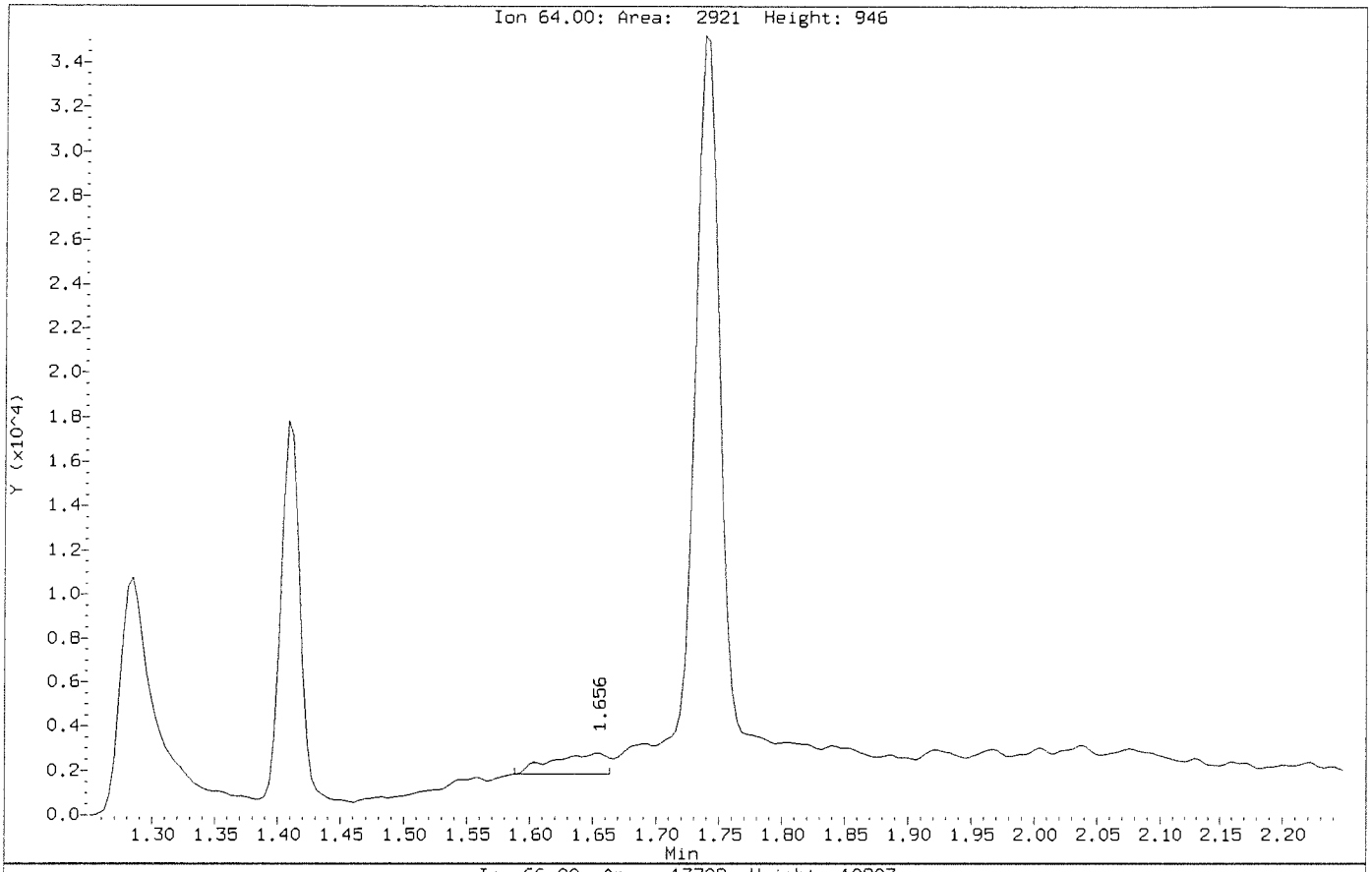


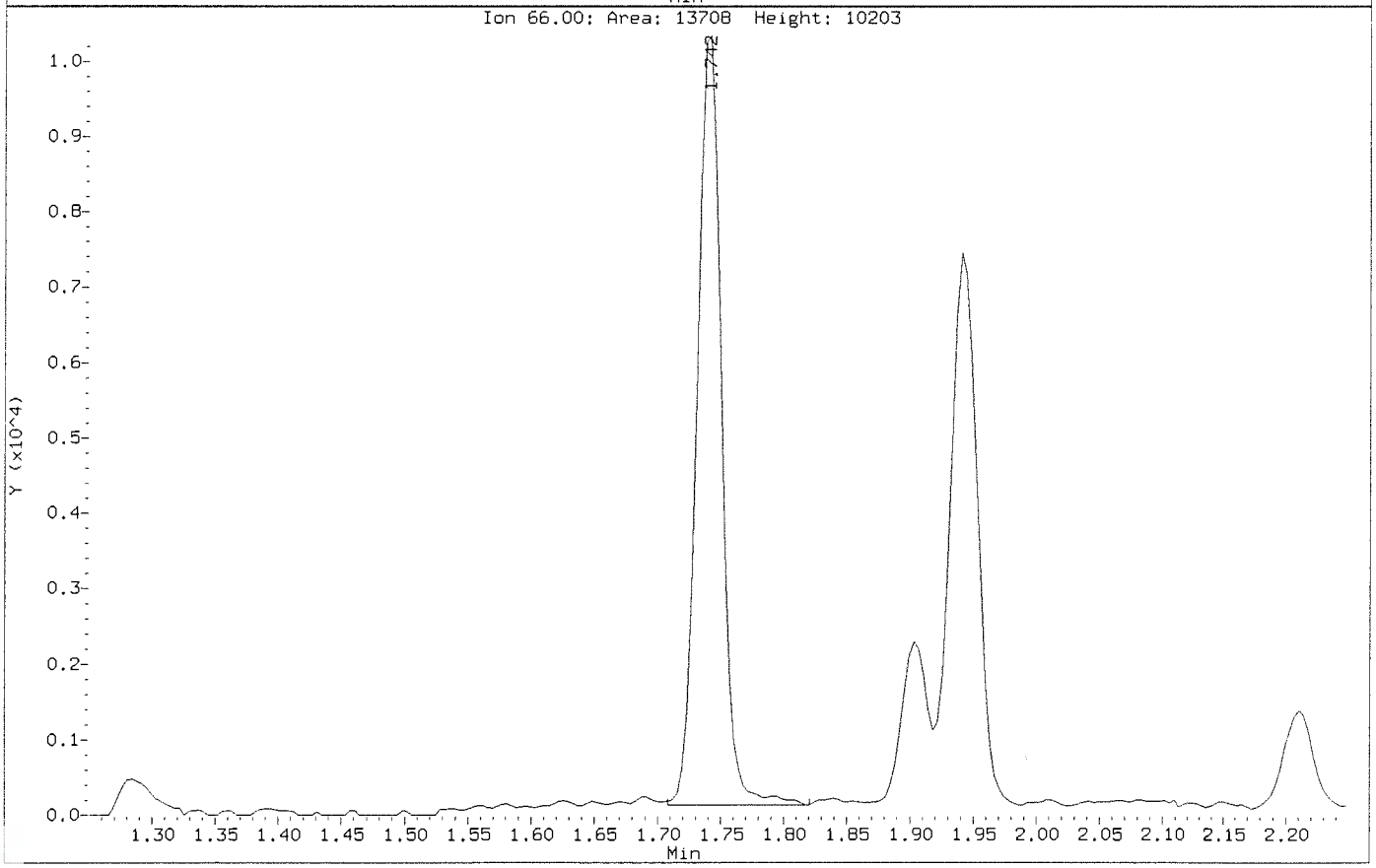
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Sample Info: HS2112024 3-02MS;HS2112024 3-02MS;3;;MS
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

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Injection Date: 15-DEC-2021 16:34
Instrument: VOA9.i
Client Sample ID: HS21120243-02MS

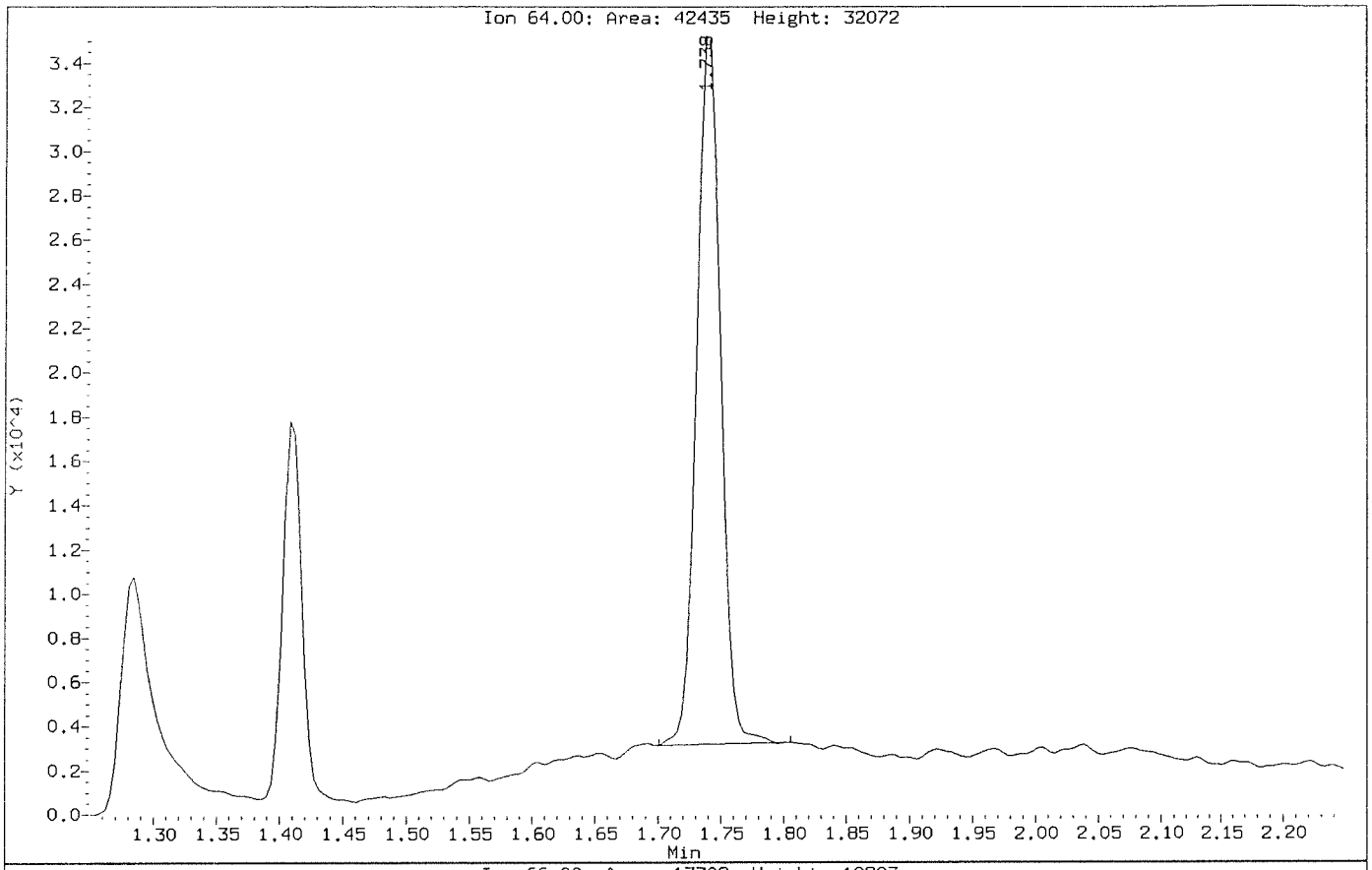
Compound: Chloroethane
CAS Number: 75-00-3

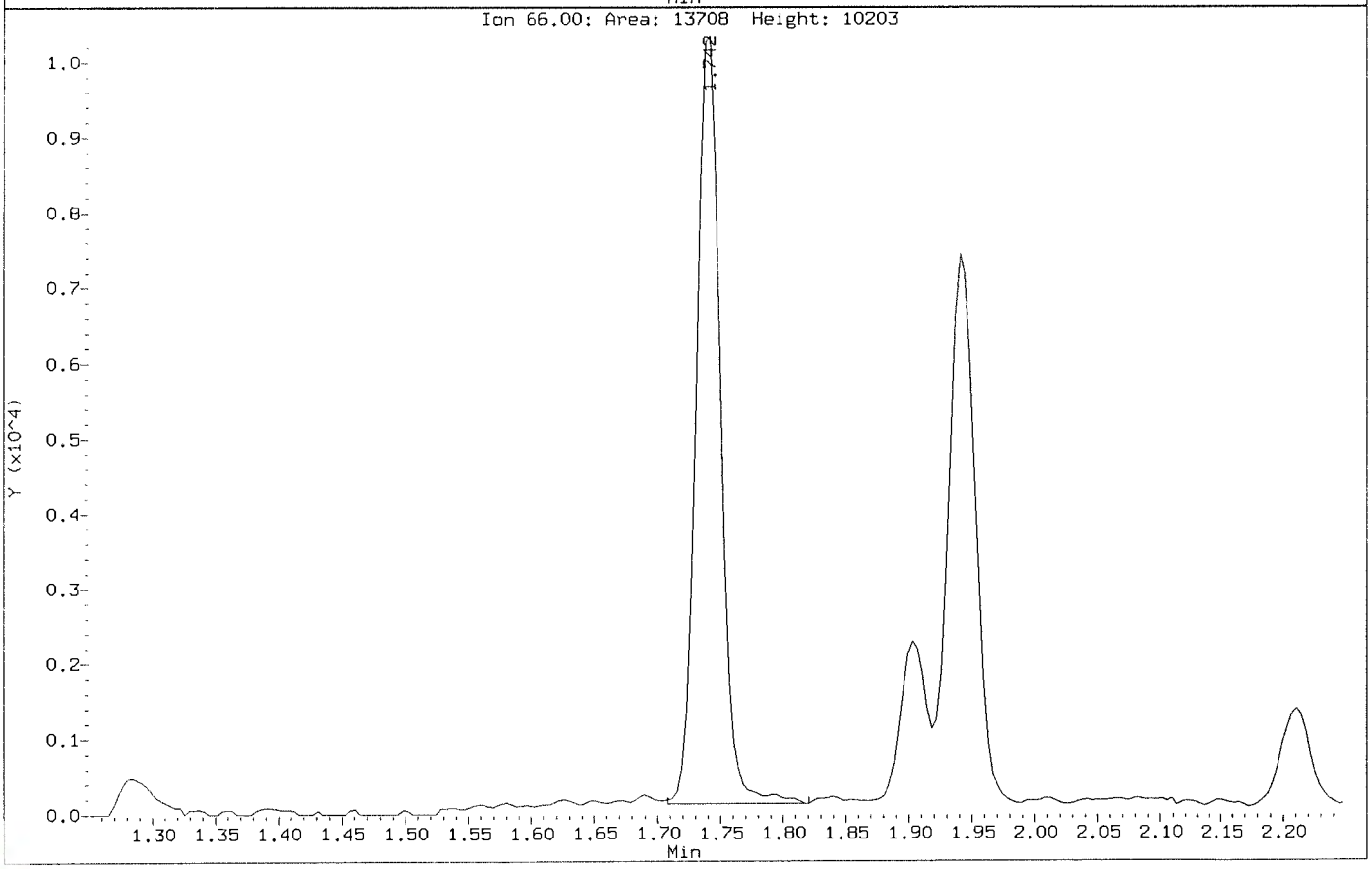




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Instrument: VOA9.i
Client Sample ID: HS21120243-02MS

Compound: Chloroethane
CAS Number: 75-00-3





Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121514.D Page 1
Report Date: 20-Dec-2021 14:53

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121514.D
Lab Smp Id: HS21120243-02MSD Client Smp ID: HS21120243-02MSD
Inj Date : 15-DEC-2021 16:56
Operator : PC Inst ID: VOA9.i
Smp Info : HS21120243-02MSD;HS21120243-02MSD;3;;MSD
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211215.b\8260C.m
Meth Date : 20-Dec-2021 14:53 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 13 QC Sample: MSD
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

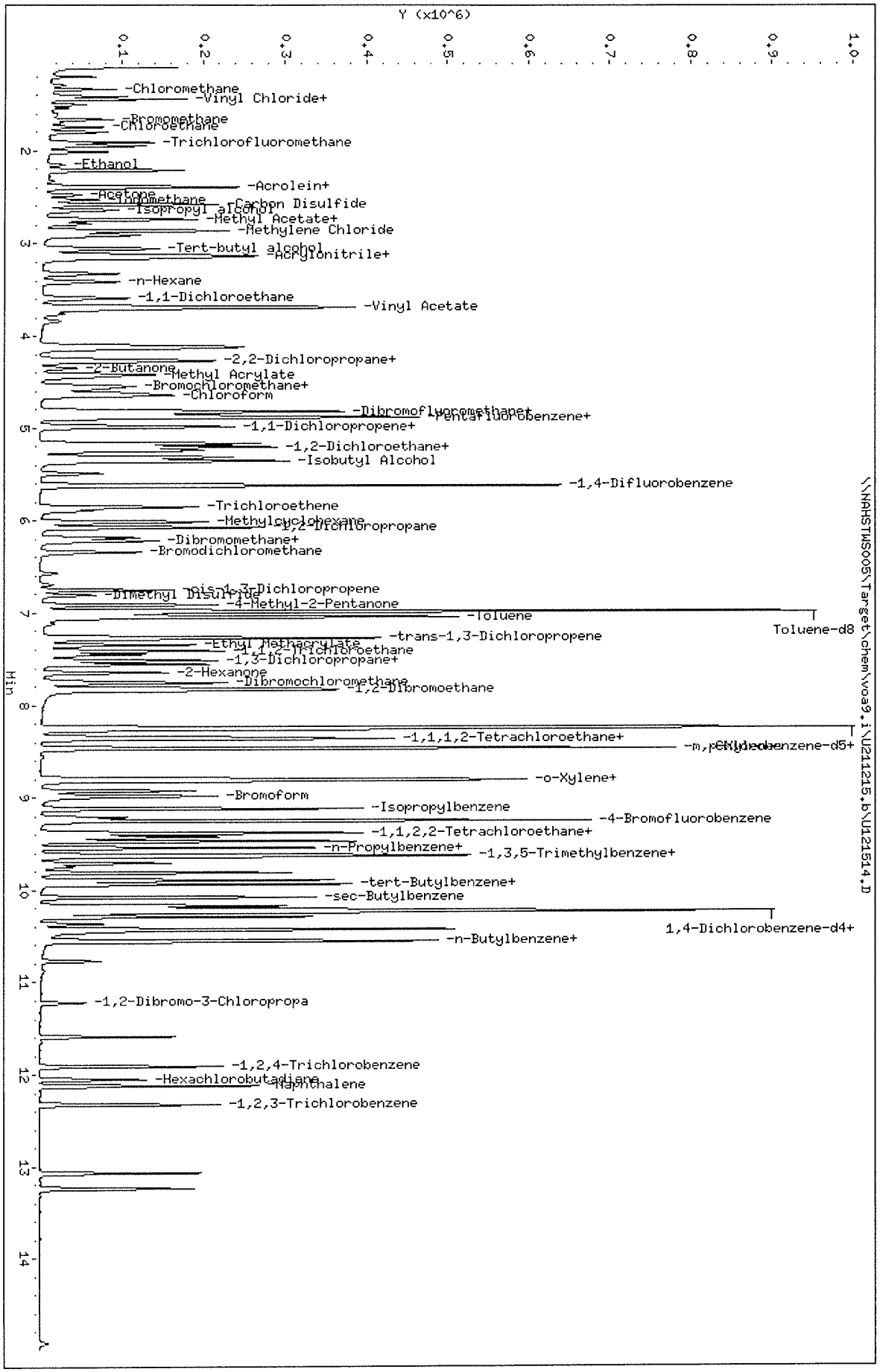
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.883	4.886	(1.000)	265978	50.0000	
* 36 1,4-Difluorobenzene	114	5.617	5.617	(1.000)	456362	50.0000	
* 47 Chlorobenzene-d5	117	8.242	8.241	(1.000)	404768	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.225	10.224	(1.000)	196574	50.0000	
$ 30 Dibromofluoromethane	113	4.819	4.823	(0.987)	143479	51.4166	51.41
$ 35 1,2-Dichloroethane-d4	65	5.168	5.171	(1.058)	169837	52.1109	52.11
$ 48 Toluene-d8	98	6.978	6.982	(0.847)	554087	52.5964	52.59
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	207345	52.8143	52.81
60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	51053	18.7185	18.71
31 1,1,1-Trichloroethane	97	4.815	4.819	(0.986)	77727	20.3004	20.30
68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	90796	21.9449	21.94
53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	52257	21.9098	21.90
22 1,1-Dichloroethane	63	3.589	3.597	(0.735)	104098	22.0299	22.02
11 1,1-Dichloroethene	96	2.390	2.397	(0.490)	45154	19.0413	19.04
32 1,1-Dichloropropene	75	4.991	4.995	(0.889)	75978	20.2738	20.27
93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	58445	16.6023	16.60
71 1,2,3-Trichloropropane	75	9.415	9.418	(0.921)	87414	21.5180	21.51
90 1,2,4-Trichlorobenzene	180	11.912	11.911	(1.165)	58855	16.2669	16.26
79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	195547	19.8429	19.84
89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	9773	16.0204	16.02
57 1,2-Dibromoethane	107	7.840	7.844	(0.951)	61918	21.3708	21.37
88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	106128	19.1450	19.14

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121514.D Page 2
Report Date: 20-Dec-2021 14:53

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.246	(0.934)	88767	21.5616	21.56
42	1,2-Dichloropropane	63	6.071	6.075	(1.081)	63795	22.2156	22.21
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	190052	19.6646	19.66
83	1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	103682	18.3133	18.31
54	1,3-Dichloropropane	76	7.556	7.555	(0.917)	113189	22.2712	22.27
84	1,4-Dichlorobenzene	146	10.243	10.247	(1.002)	109653	18.8225	18.82
26	2,2-Dichloropropane	77	4.260	4.264	(0.873)	54260	20.2612	20.26
24	2-Butanone	43	4.347	4.347	(0.890)	54045	38.8589	38.85
76	2-Chlorotoluene	91	9.539	9.538	(0.933)	174100	20.5677	20.56
52	2-Hexanone	43	7.646	7.645	(0.928)	85219	44.3514	44.35
77	4-Chlorotoluene	91	9.629	9.628	(0.942)	201617	20.5528	20.55
82	p-Isopropyltoluene	119	10.198	10.202	(0.997)	179384	18.7259	18.72
45	4-Methyl-2-Pentanone	43	6.911	6.914	(0.839)	121720	41.7548	41.75
10	Acetone	43	2.476	2.480	(0.507)	40752	40.1839	40.18
37	Benzene	78	5.205	5.209	(0.927)	244848	21.2181	21.21
74	Bromobenzene	156	9.374	9.374	(0.917)	58719	19.2621	19.26
29	Bromochloromethane	128	4.542	4.549	(0.930)	31658	21.1014	21.10
39	Bromodichloromethane	83	6.341	6.341	(1.129)	68913	19.2080	19.20
66	Bromoform	173	8.973	8.976	(1.089)	26558	15.2008	15.20
6	Bromomethane	94	1.659	1.666	(0.340)	34352	20.6622	20.66
19	Carbon Disulfide	76	2.577	2.585	(0.528)	253048	38.4475	38.44
34	Carbon Tetrachloride	117	4.980	4.984	(0.887)	62269	18.1558	18.15
59	Chlorobenzene	112	8.264	8.264	(1.003)	154427	19.5702	19.57
7	Chloroethane	64	1.741	1.749	(0.357)	42488	19.3050	19.30(M)
28	Chloroform	83	4.647	4.650	(0.952)	112029	21.8664	21.86
3	Chloromethane	50	1.333	1.340	(0.273)	48371	17.8802	17.88
27	cis-1,2-Dichloroethene	96	4.272	4.279	(0.875)	67983	20.9205	20.92
46	cis-1,3-Dichloropropene	75	6.750	6.749	(1.202)	82062	18.2087	18.20
55	Dibromochloromethane	129	7.750	7.750	(0.940)	50062	17.4278	17.42
44	Dibromomethane	93	6.180	6.183	(1.100)	40764	20.8133	20.81
2	Dichlorodifluoromethane	85	1.198	1.205	(0.245)	29414	8.68523	8.68
61	Ethylbenzene	106	8.362	8.361	(1.015)	77436	19.6078	19.60
91	Hexachlorobutadiene	225	12.050	12.054	(1.179)	21390	15.9958	15.99
67	Isopropylbenzene	105	9.115	9.115	(1.106)	231751	19.4888	19.48
62	m,p-Xylenes	106	8.463	8.463	(1.027)	194994	39.9610	39.96
17	Methylene Chloride	84	2.858	2.866	(0.585)	62545	19.9543	19.95
87	n-Butylbenzene	91	10.547	10.547	(1.032)	168611	19.6304	19.63
73	n-Propylbenzene	91	9.467	9.467	(0.926)	276616	20.7182	20.71
92	Naphthalene	128	12.121	12.121	(1.186)	186978	17.2636	17.26
63	o-Xylene	106	8.800	8.800	(1.068)	97467	20.1668	20.16
81	sec-Butylbenzene	105	10.075	10.075	(0.985)	212517	19.3739	19.37
64	Styrene	104	8.815	8.815	(1.070)	167620	20.1972	20.19
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	156210	19.1742	19.17
56	Tetrachloroethene	164	7.514	7.514	(0.912)	40454	17.7214	17.72
50	Toluene	91	7.038	7.038	(0.854)	252551	20.8561	20.85
20	trans-1,2-Dichloroethene	96	3.128	3.136	(0.641)	52957	19.7967	19.79
51	trans-1,3-Dichloropropene	75	7.252	7.255	(1.291)	66437	17.5437	17.54
38	Trichloroethene	130	5.850	5.853	(1.041)	57402	19.2534	19.25
8	Trichlorofluoromethane	101	1.944	1.951	(0.398)	78712	18.3503	18.35
5	Vinyl Chloride	62	1.411	1.419	(0.289)	55889	17.3742	17.37

QC Flag Legend

M - Compound response manually integrated.

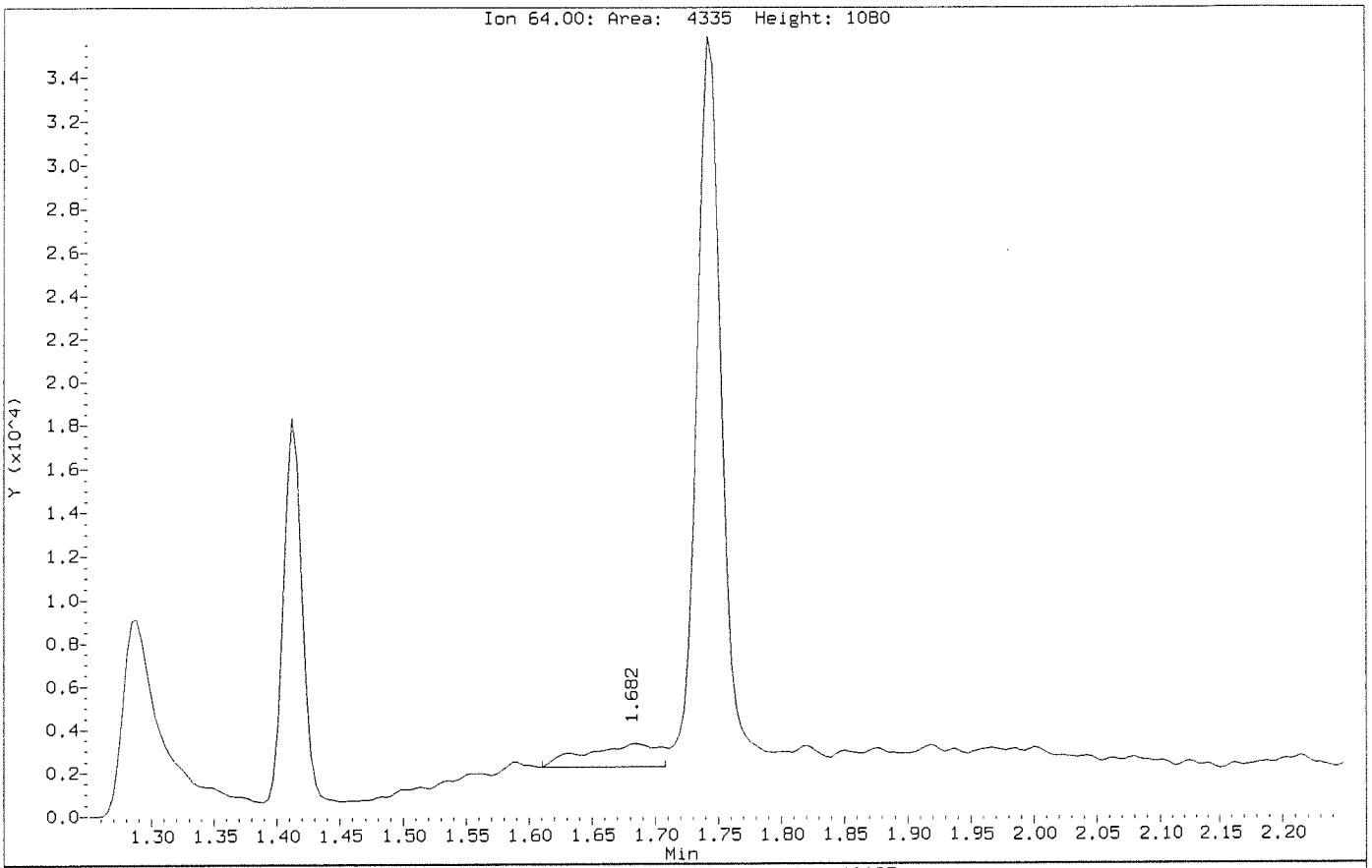


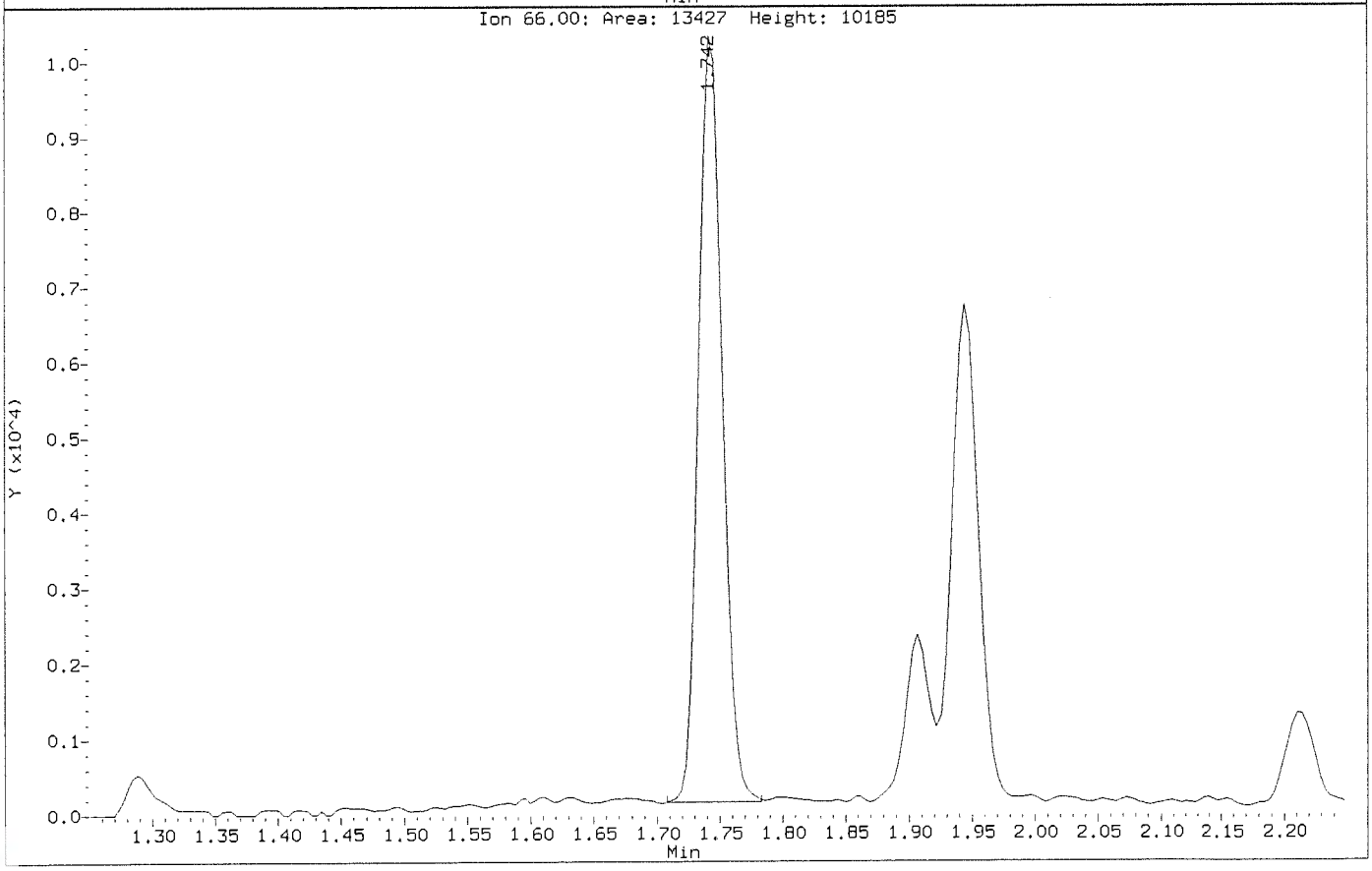
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Sample Info: HS21120243-02MSD;HS21120243-02MSD;3;;HSD
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

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Injection Date: 15-DEC-2021 16:56
Instrument: VOA9.i
Client Sample ID: HS21120243-02MSD

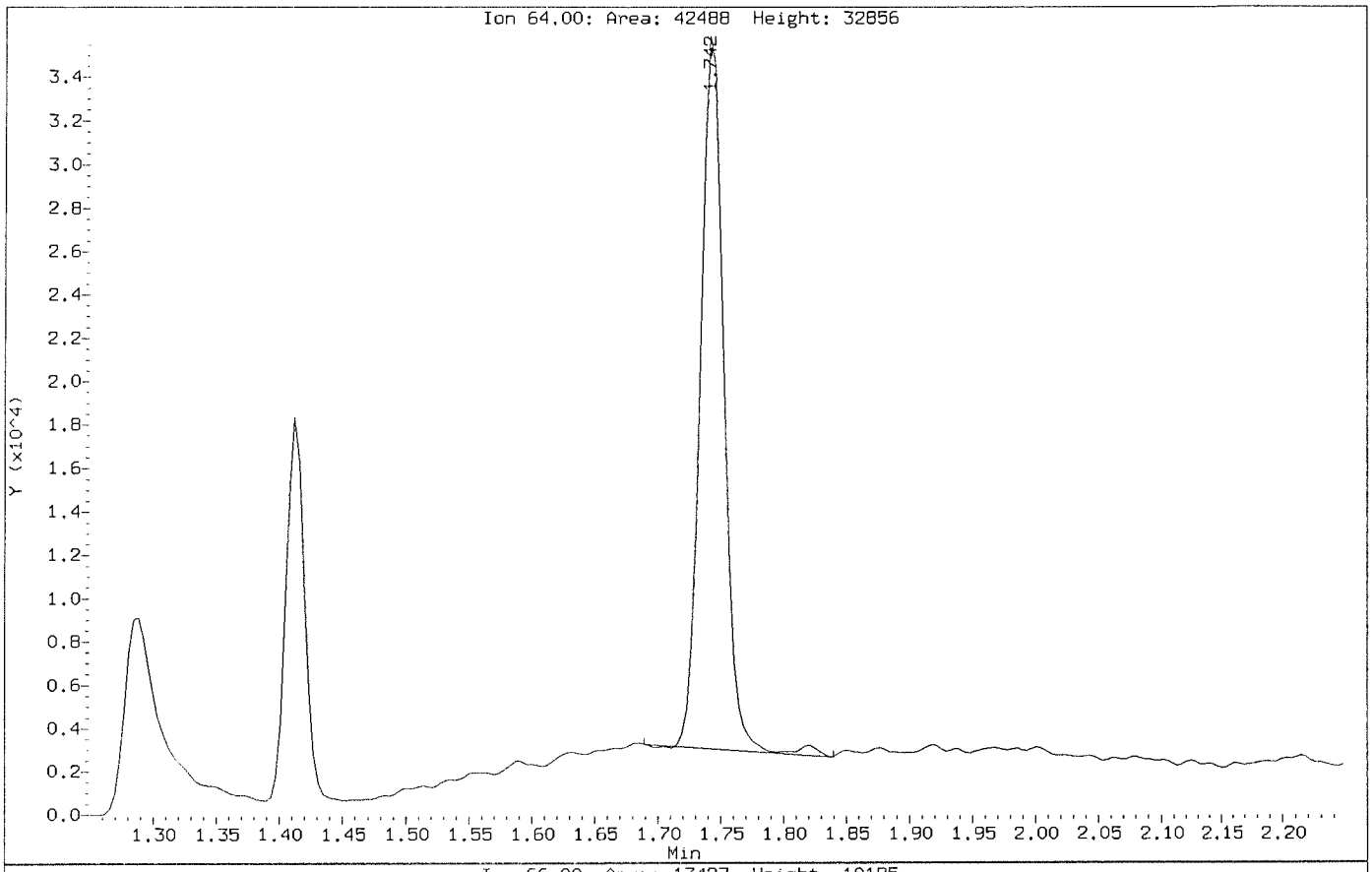
Compound: Chloroethane
CAS Number: 75-00-3

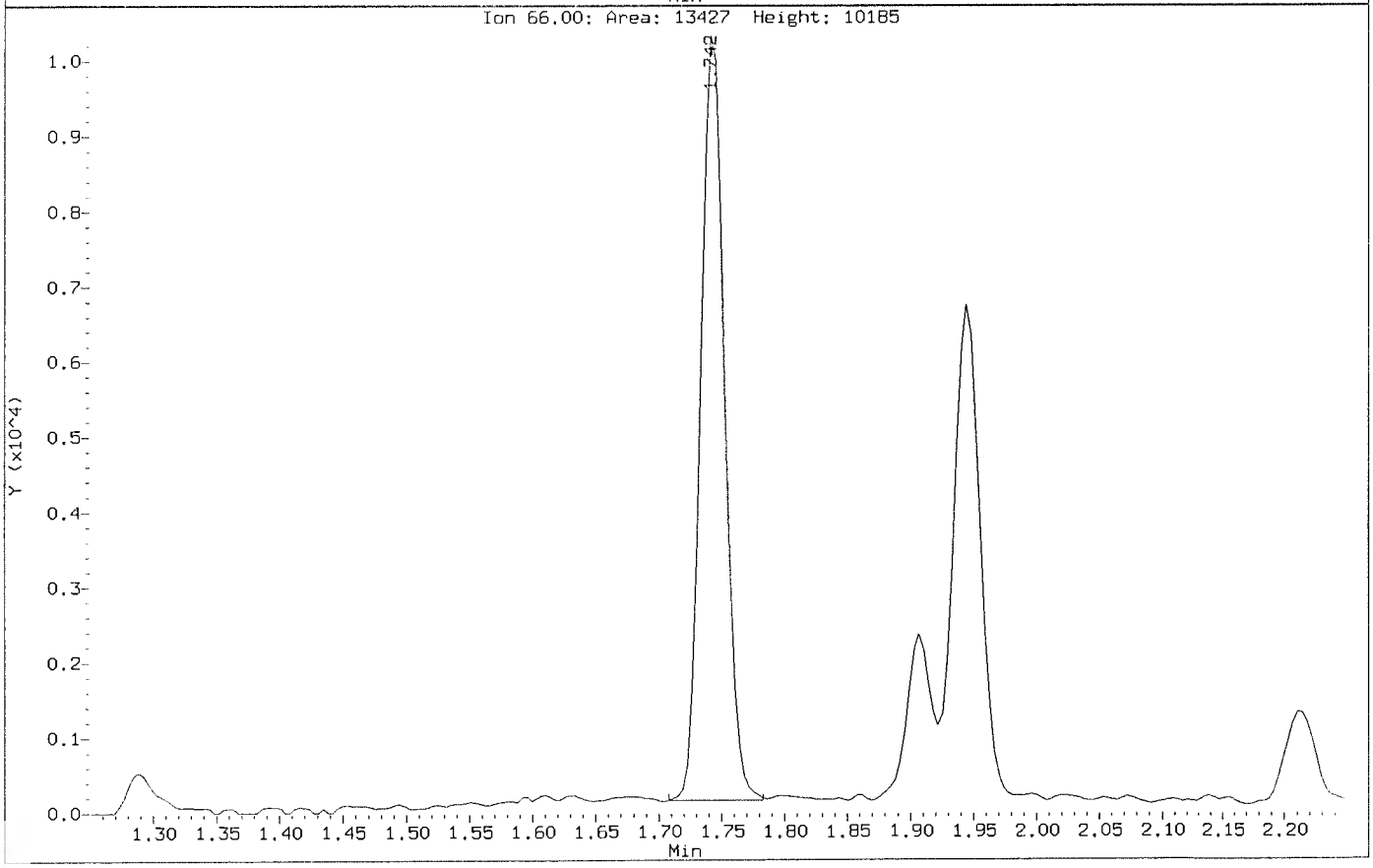




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Injection Date: 15-DEC-2021 16:56
Instrument: VOA9.i
Client Sample ID: HS21120243-02MSD

Compound: Chloroethane
CAS Number: 75-00-3





ALS Laboratory Group

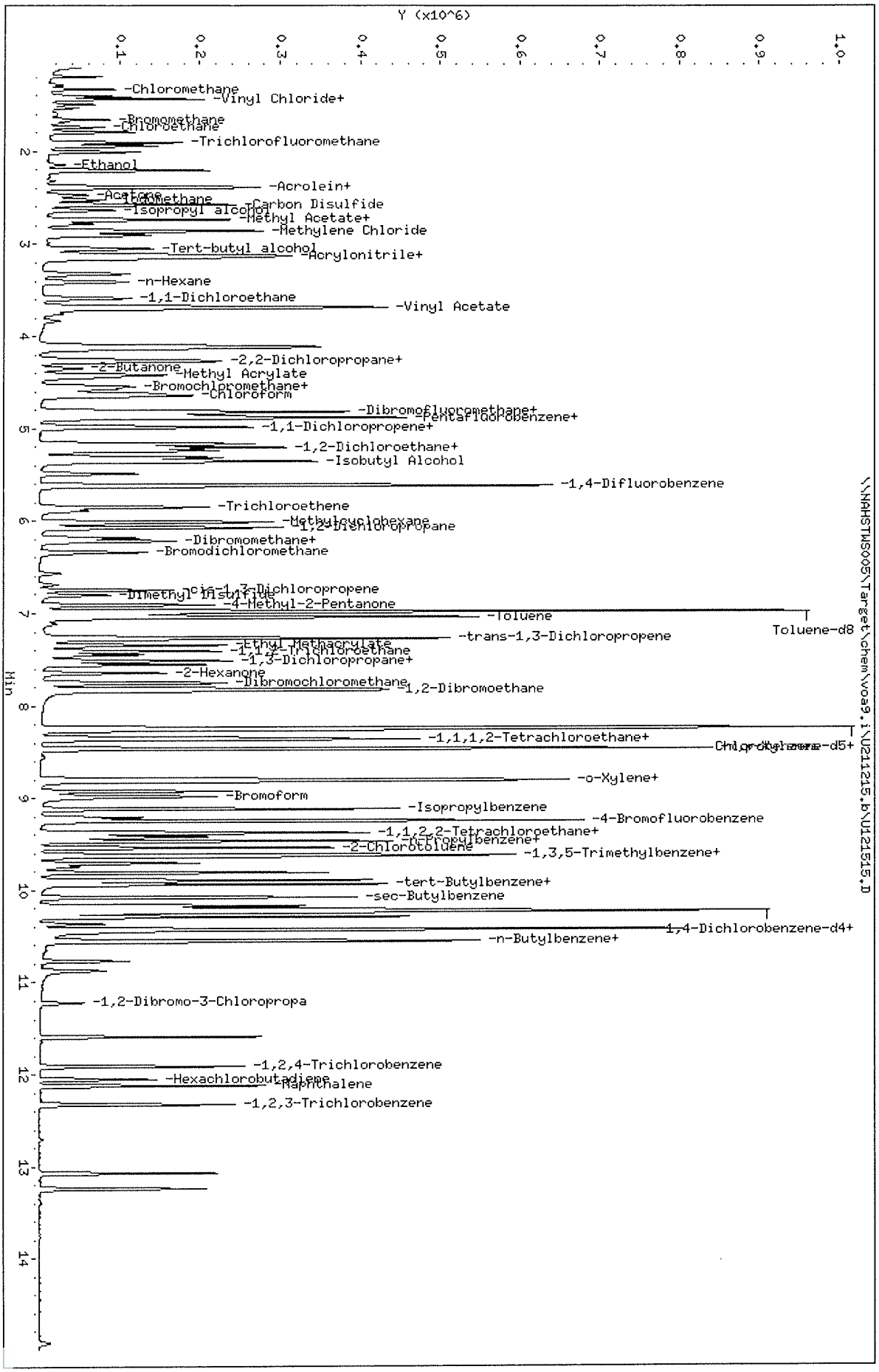
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Operator : PC Inst ID: VOA9.i
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Meth Date : 20-Dec-2021 14:53 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 14 QC Sample: MS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.883	4.886	(1.000)	265521	50.0000	
* 36 1,4-Difluorobenzene	114	5.614	5.617	(1.000)	457941	50.0000	
* 47 Chlorobenzene-d5	117	8.241	8.241	(1.000)	405455	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.224	10.224	(1.000)	196579	50.0000	
$ 30 Dibromofluoromethane	113	4.819	4.823	(0.987)	143568	51.5390	51.53
$ 35 1,2-Dichloroethane-d4	65	5.164	5.171	(1.058)	170957	52.5573	52.55
$ 48 Toluene-d8	98	6.978	6.982	(0.847)	552823	52.3875	52.38
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	207092	52.6566	52.65
60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	53038	19.3828	19.38
31 1,1,1-Trichloroethane	97	4.811	4.819	(0.985)	84551	22.1206	22.12
68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	90024	21.7578	21.75
53 1,1,2-Trichloroethane	83	7.409	7.413	(0.899)	52844	22.1183	22.11
22 1,1-Dichloroethane	63	3.586	3.597	(0.734)	108323	22.9635	22.96
11 1,1-Dichloroethene	96	2.386	2.397	(0.489)	49579	20.9433	20.94
32 1,1-Dichloropropene	75	4.988	4.995	(0.888)	85243	22.6676	22.66
93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	62944	17.8799	17.87
71 1,2,3-Trichloropropane	75	9.415	9.418	(0.921)	85343	21.0077	21.00
90 1,2,4-Trichlorobenzene	180	11.911	11.911	(1.165)	66551	18.3935	18.39
79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	224360	22.7660	22.76
89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	9189	15.2082	15.20
57 1,2-Dibromoethane	107	7.840	7.844	(0.951)	61550	21.2077	21.20
88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	114970	20.7395	20.73

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
33	1,2-Dichloroethane	62	5.242	5.246	(0.934)	89769	21.7298	21.72
42	1,2-Dichloropropane	63	6.071	6.075	(1.081)	65133	22.6033	22.60
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	215046	22.2502	22.25
83	1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	114364	20.1996	20.19
54	1,3-Dichloropropane	76	7.555	7.555	(0.917)	112509	22.0999	22.09
84	1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	121032	20.7752	20.77
26	2,2-Dichloropropane	77	4.257	4.264	(0.872)	57766	21.6075	21.60
24	2-Butanone	43	4.343	4.347	(0.889)	55759	40.1603	40.16
76	2-Chlorotoluene	91	9.538	9.538	(0.933)	189607	22.3990	22.39
52	2-Hexanone	43	7.645	7.645	(0.928)	81867	42.5347	42.53
77	4-Chlorotoluene	91	9.628	9.628	(0.942)	222887	22.7205	22.72
82	p-Isopropyltoluene	119	10.202	10.202	(0.998)	213456	22.2821	22.28
45	4-Methyl-2-Pentanone	43	6.911	6.914	(0.839)	118907	40.7207	40.72
10	Acetone	43	2.468	2.480	(0.506)	49223	50.0135	50.01
37	Benzene	78	5.205	5.209	(0.927)	260001	22.4536	22.45
74	Bromobenzene	156	9.374	9.374	(0.917)	63029	20.6754	20.67
29	Bromochloromethane	128	4.541	4.549	(0.930)	31177	20.8166	20.81
39	Bromodichloromethane	83	6.337	6.341	(1.129)	74485	20.6095	20.60
66	Bromoform	173	8.972	8.976	(1.089)	26882	15.3442	15.34
6	Bromomethane	94	1.655	1.666	(0.339)	35101	21.1611	21.16
19	Carbon Disulfide	76	2.573	2.585	(0.527)	279386	42.5223	42.52
34	Carbon Tetrachloride	117	4.976	4.984	(0.886)	70288	20.2352	20.23
59	Chlorobenzene	112	8.264	8.264	(1.003)	166213	21.0281	21.02
7	Chloroethane	64	1.737	1.749	(0.356)	44963	20.4647	20.46
28	Chloroform	83	4.643	4.650	(0.951)	131771	25.7641	25.76
3	Chloromethane	50	1.329	1.340	(0.272)	52237	19.3904	19.39
27	cis-1,2-Dichloroethene	96	4.272	4.279	(0.875)	71838	22.1448	22.14
46	cis-1,3-Dichloropropene	75	6.749	6.749	(1.202)	83911	18.5216	18.52
55	Dibromochloromethane	129	7.747	7.750	(0.940)	53379	18.4544	18.45
44	Dibromomethane	93	6.180	6.183	(1.101)	40897	20.8092	20.80
2	Dichlorodifluoromethane	85	1.194	1.205	(0.245)	34910	10.4603	10.46
61	Ethylbenzene	106	8.361	8.361	(1.015)	86283	21.8110	21.81
91	Hexachlorobutadiene	225	12.054	12.054	(1.179)	23933	17.8970	17.89
67	Isopropylbenzene	105	9.115	9.115	(1.106)	261067	21.9169	21.91
62	m,p-Xylenes	106	8.463	8.463	(1.027)	214487	43.8813	43.88
17	Methylene Chloride	84	2.855	2.866	(0.585)	64570	20.6358	20.63
87	n-Butylbenzene	91	10.547	10.547	(1.032)	191664	22.3138	22.31
73	n-Propylbenzene	91	9.467	9.467	(0.926)	316094	23.6745	23.67
92	Naphthalene	128	12.121	12.121	(1.186)	192709	17.7923	17.79
63	o-Xylene	106	8.800	8.800	(1.068)	103749	21.4303	21.43
81	sec-Butylbenzene	105	10.078	10.075	(0.986)	247294	22.5437	22.54
64	Styrene	104	8.815	8.815	(1.070)	181864	21.8764	21.87
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	177494	21.7862	21.78
56	Tetrachloroethene	164	7.514	7.514	(0.912)	45199	19.7665	19.76
50	Toluene	91	7.038	7.038	(0.854)	273380	22.5379	22.53
20	trans-1,2-Dichloroethene	96	3.124	3.136	(0.640)	56701	21.2328	21.23
51	trans-1,3-Dichloropropene	75	7.252	7.255	(1.292)	67924	17.8346	17.83
38	Trichloroethene	130	5.850	5.853	(1.042)	62721	20.9650	20.96
8	Trichlorofluoromethane	101	1.940	1.951	(0.397)	91069	21.2677	21.26
5	Vinyl Chloride	62	1.408	1.419	(0.288)	62237	19.3809	19.38



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121515.D
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Sample Info: HS211202555-05MS;HS211202555-05MS;3;;MS
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121516.D Page 1
Report Date: 20-Dec-2021 14:53

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121516.D
Lab Smp Id: HS21120255-05MSD Client Smp ID: HS21120255-05MSD
Inj Date : 15-DEC-2021 17:41
Operator : PC Inst ID: VOA9.i
Smp Info : HS21120255-05MSD;HS21120255-05MSD;3;;MSD
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211215.b\8260C.m
Meth Date : 20-Dec-2021 14:53 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 14 QC Sample: MSD
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

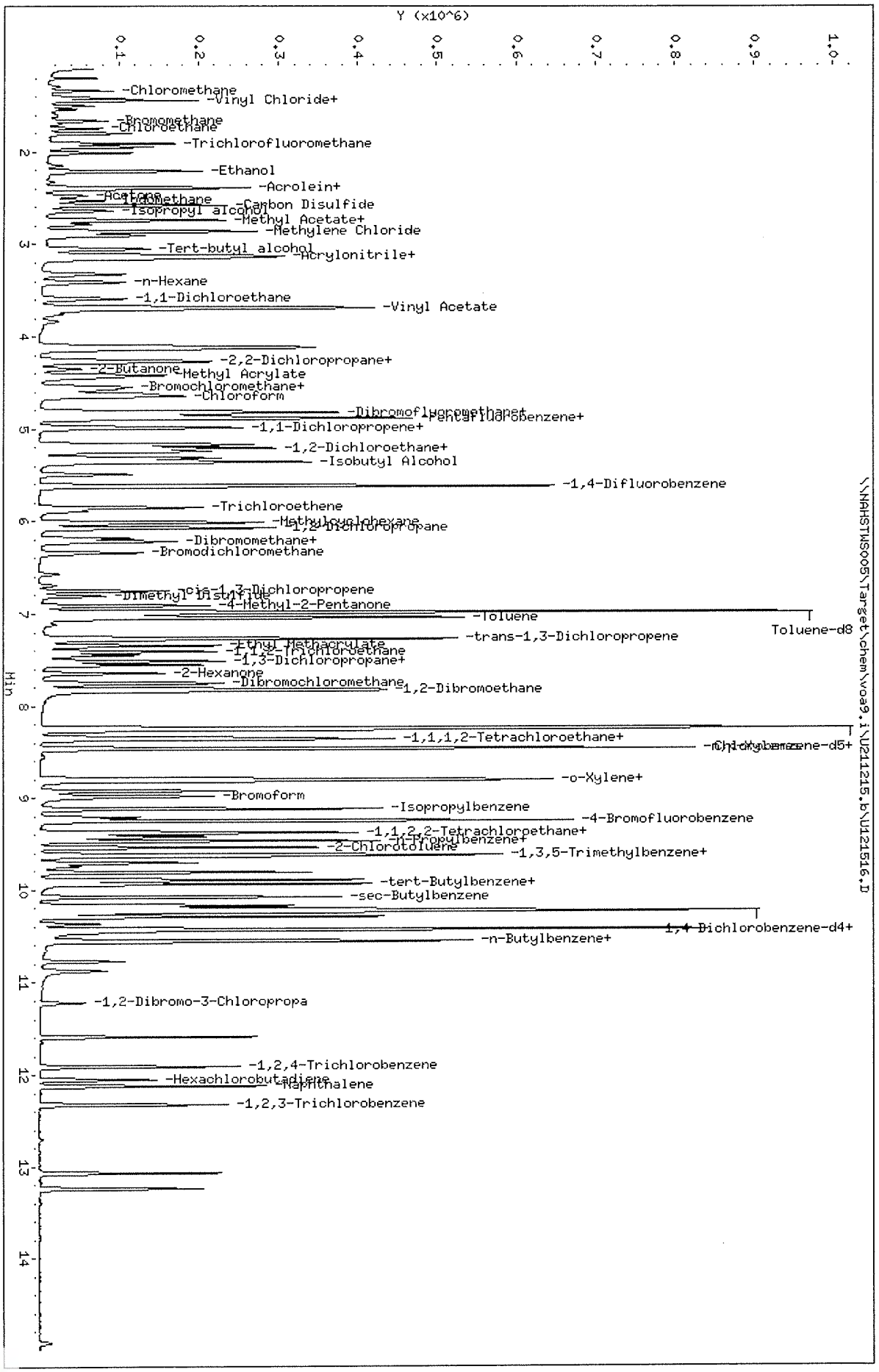
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
*	1 Pentafluorobenzene	168	4.883	4.886	(1.000)	270607	50.0000	
*	36 1,4-Difluorobenzene	114	5.614	5.617	(1.000)	458200	50.0000	
*	47 Chlorobenzene-d5	117	8.241	8.241	(1.000)	410024	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.224	10.224	(1.000)	197067	50.0000	
$	30 Dibromofluoromethane	113	4.819	4.823	(0.987)	142884	50.3093	50.30
$	35 1,2-Dichloroethane-d4	65	5.164	5.171	(1.058)	173625	52.3691	52.36
$	48 Toluene-d8	98	6.978	6.982	(0.847)	560201	52.4951	52.49
$	69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	207671	52.2041	52.20
	60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	50942	18.4508	18.45
	31 1,1,1-Trichloroethane	97	4.811	4.819	(0.985)	81773	20.9917	20.99
	68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	88932	21.4406	21.44
	53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	50819	21.0337	21.03
	22 1,1-Dichloroethane	63	3.589	3.597	(0.735)	103464	21.5212	21.52
	11 1,1-Dichloroethene	96	2.390	2.397	(0.489)	47860	19.8372	19.83
	32 1,1-Dichloropropene	75	4.991	4.995	(0.889)	83096	22.0842	22.08
	93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	61988	17.5647	17.56
	71 1,2,3-Trichloropropane	75	9.415	9.418	(0.921)	85445	20.9807	20.98
	90 1,2,4-Trichlorobenzene	180	11.911	11.911	(1.165)	64823	17.8715	17.87
	79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	218455	22.1120	22.11
	89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	9346	15.3943	15.39
	57 1,2-Dibromoethane	107	7.840	7.844	(0.951)	60221	20.5186	20.51
	88 1,2-Dichlorobenzene	146	10.558	10.562	(1.033)	109932	19.7816	19.78

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121516.D Page 2
Report Date: 20-Dec-2021 14:53

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
33	1,2-Dichloroethane	62	5.242	5.246	(0.934)	87737	21.2260	21.22
42	1,2-Dichloropropane	63	6.071	6.075	(1.081)	63014	21.8556	21.85
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	205760	21.2367	21.23
83	1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	110337	19.4400	19.44
54	1,3-Dichloropropane	76	7.555	7.555	(0.917)	109377	21.2452	21.24
84	1,4-Dichlorobenzene	146	10.243	10.247	(1.002)	116334	19.9193	19.91
26	2,2-Dichloropropane	77	4.260	4.264	(0.873)	54631	20.0508	20.05
24	2-Butanone	43	4.347	4.347	(0.890)	56756	40.1100	40.11
76	2-Chlorotoluene	91	9.538	9.538	(0.933)	182216	21.4726	21.47
52	2-Hexanone	43	7.645	7.645	(0.928)	84544	43.4361	43.43
77	4-Chlorotoluene	91	9.628	9.628	(0.942)	214362	21.7974	21.79
82	p-Isopropyltoluene	119	10.198	10.202	(0.997)	204129	21.2557	21.25
45	4-Methyl-2-Pentanone	43	6.911	6.914	(0.839)	118169	40.0170	40.01
10	Acetone	43	2.472	2.480	(0.506)	49398	49.1464	49.14
37	Benzene	78	5.205	5.209	(0.927)	247990	21.4042	21.40
74	Bromobenzene	156	9.374	9.374	(0.917)	60319	19.7375	19.73
29	Bromochloromethane	128	4.541	4.549	(0.930)	30709	20.1187	20.11
39	Bromodichloromethane	83	6.337	6.341	(1.129)	73388	20.3104	20.31
66	Bromoform	173	8.972	8.976	(1.089)	26636	15.0651	15.06
6	Bromomethane	94	1.659	1.666	(0.340)	33392	19.7183	19.71
19	Carbon Disulfide	76	2.577	2.585	(0.528)	269519	40.2496	40.24
34	Carbon Tetrachloride	117	4.980	4.984	(0.887)	66946	19.3346	19.33
59	Chlorobenzene	112	8.264	8.264	(1.003)	160278	20.0513	20.05
7	Chloroethane	64	1.741	1.749	(0.357)	43359	19.3637	19.36(M)
28	Chloroform	83	4.646	4.650	(0.952)	127787	24.5155	24.51
3	Chloromethane	50	1.333	1.340	(0.273)	49995	18.1737	18.17
27	cis-1,2-Dichloroethene	96	4.272	4.279	(0.875)	69455	21.0078	21.00
46	cis-1,3-Dichloropropene	75	6.749	6.749	(1.202)	81791	18.0885	18.08
55	Dibromochloromethane	129	7.747	7.750	(0.940)	52545	18.0035	18.00
44	Dibromomethane	93	6.180	6.183	(1.101)	39825	20.2523	20.25
2	Dichlorodifluoromethane	85	1.198	1.205	(0.245)	33456	9.79375	9.79
61	Ethylbenzene	106	8.361	8.361	(1.015)	81914	20.4758	20.47
91	Hexachlorobutadiene	225	12.054	12.054	(1.179)	24094	17.9728	17.97
67	Isopropylbenzene	105	9.115	9.115	(1.106)	253930	21.0802	21.08
62	m,p-Xylenes	106	8.463	8.463	(1.027)	207487	41.9762	41.97
17	Methylene Chloride	84	2.858	2.866	(0.585)	62999	19.7554	19.75
87	n-Butylbenzene	91	10.547	10.547	(1.032)	186472	21.6556	21.65
73	n-Propylbenzene	91	9.467	9.467	(0.926)	300646	22.4617	22.46
92	Naphthalene	128	12.121	12.121	(1.186)	190624	17.5562	17.55
63	o-Xylene	106	8.800	8.800	(1.068)	99967	20.4190	20.41
81	sec-Butylbenzene	105	10.078	10.075	(0.986)	239188	21.7508	21.75
64	Styrene	104	8.815	8.815	(1.070)	176847	21.0358	21.03
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	173658	21.2626	21.26
56	Tetrachloroethene	164	7.514	7.514	(0.912)	43555	18.8353	18.83
50	Toluene	91	7.038	7.038	(0.854)	263079	21.4470	21.44
20	trans-1,2-Dichloroethene	96	3.124	3.136	(0.640)	54374	19.9787	19.97
51	trans-1,3-Dichloropropene	75	7.252	7.255	(1.292)	66507	17.4980	17.49
38	Trichloroethene	130	5.850	5.853	(1.042)	59713	19.9482	19.94
8	Trichlorofluoromethane	101	1.944	1.951	(0.398)	86555	19.8336	19.83
5	Vinyl Chloride	62	1.411	1.419	(0.289)	58913	18.0010	18.00

QC Flag Legend

M - Compound response manually integrated.

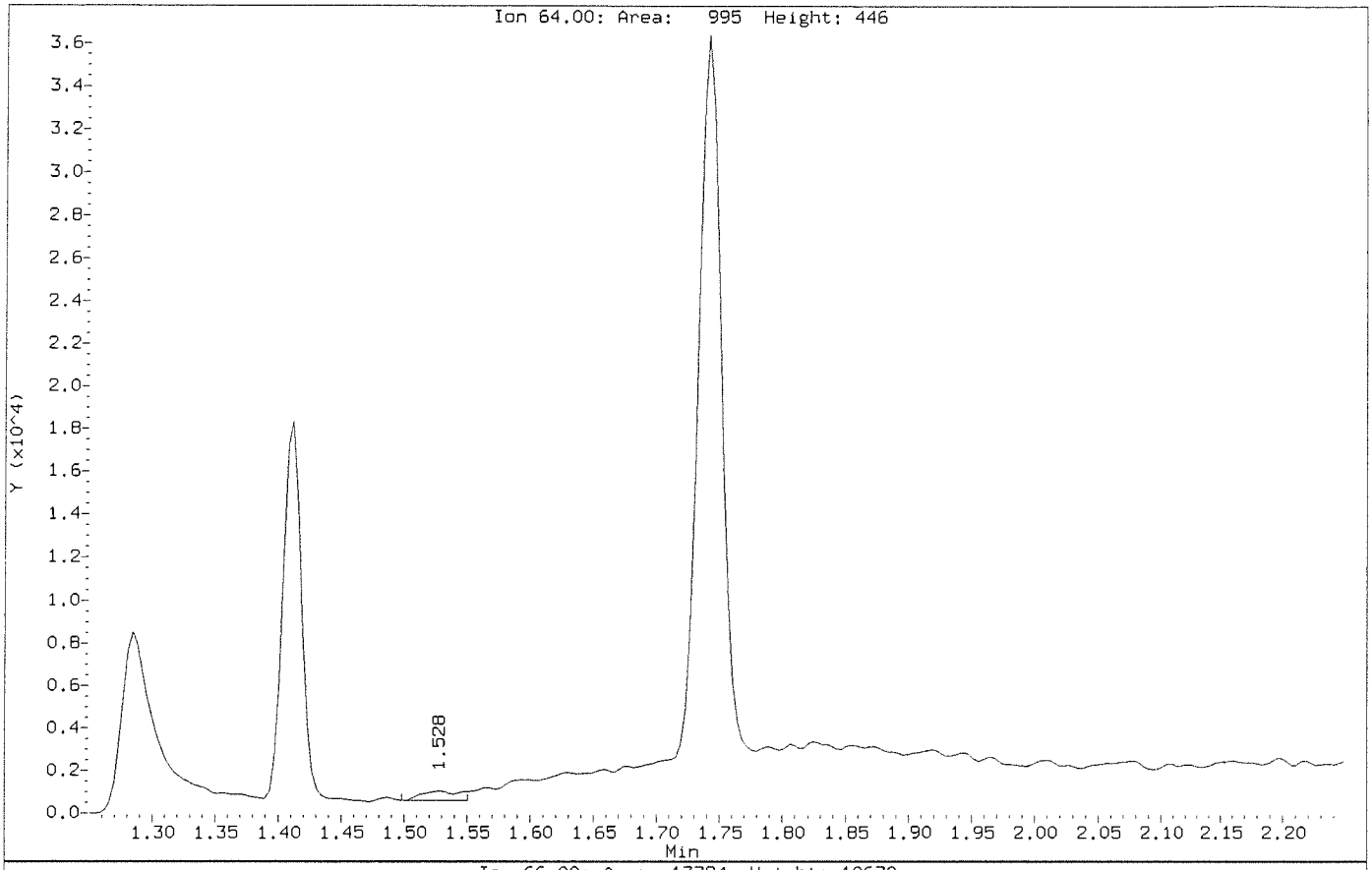


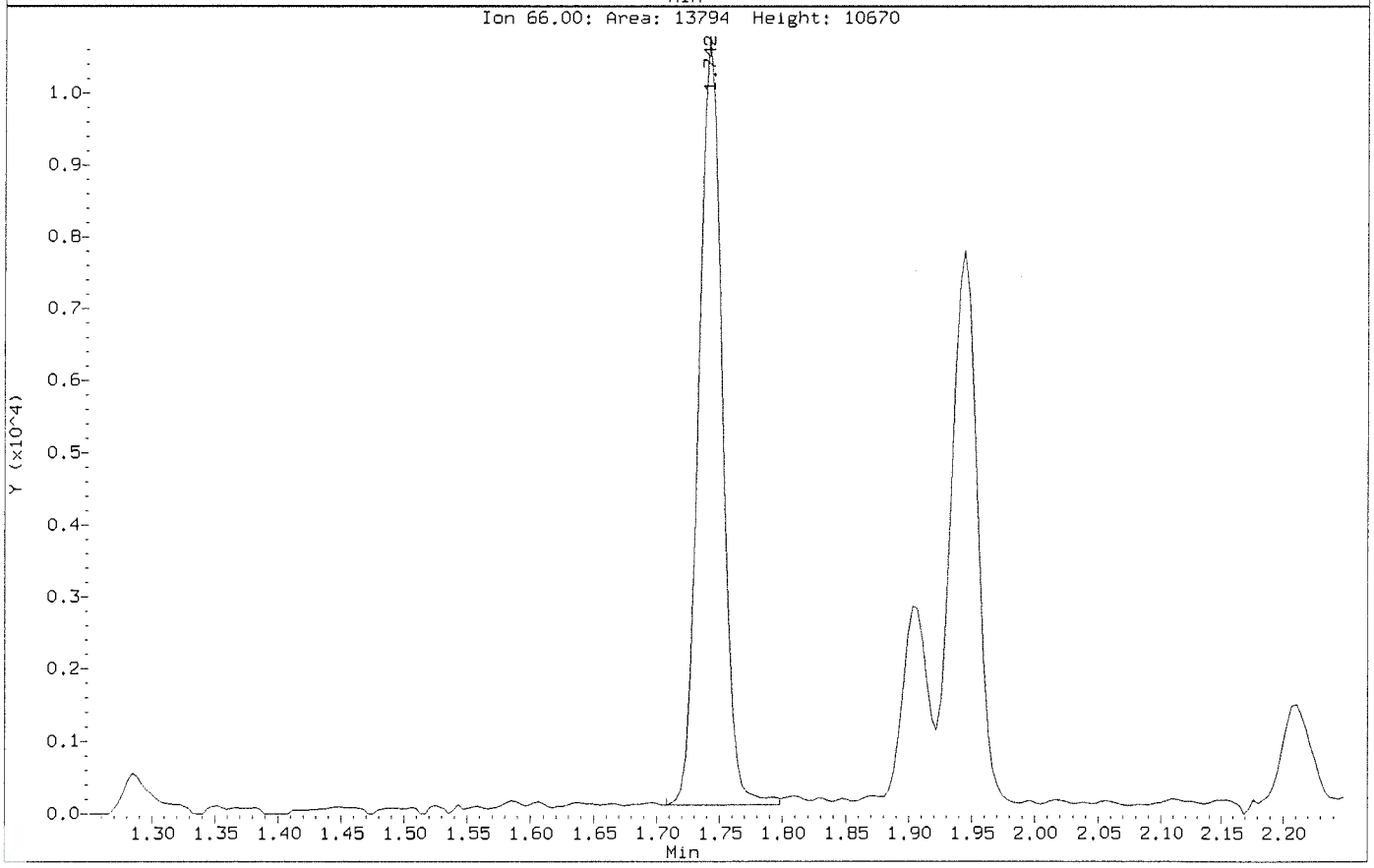
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Sample Info: HS21120255-05MSD;HS21120255-05MSD;3;;MSD
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\before\U121516.D
Injection Date: 15-DEC-2021 17:41
Instrument: VOA9.i
Client Sample ID: HS21120255-05MSD

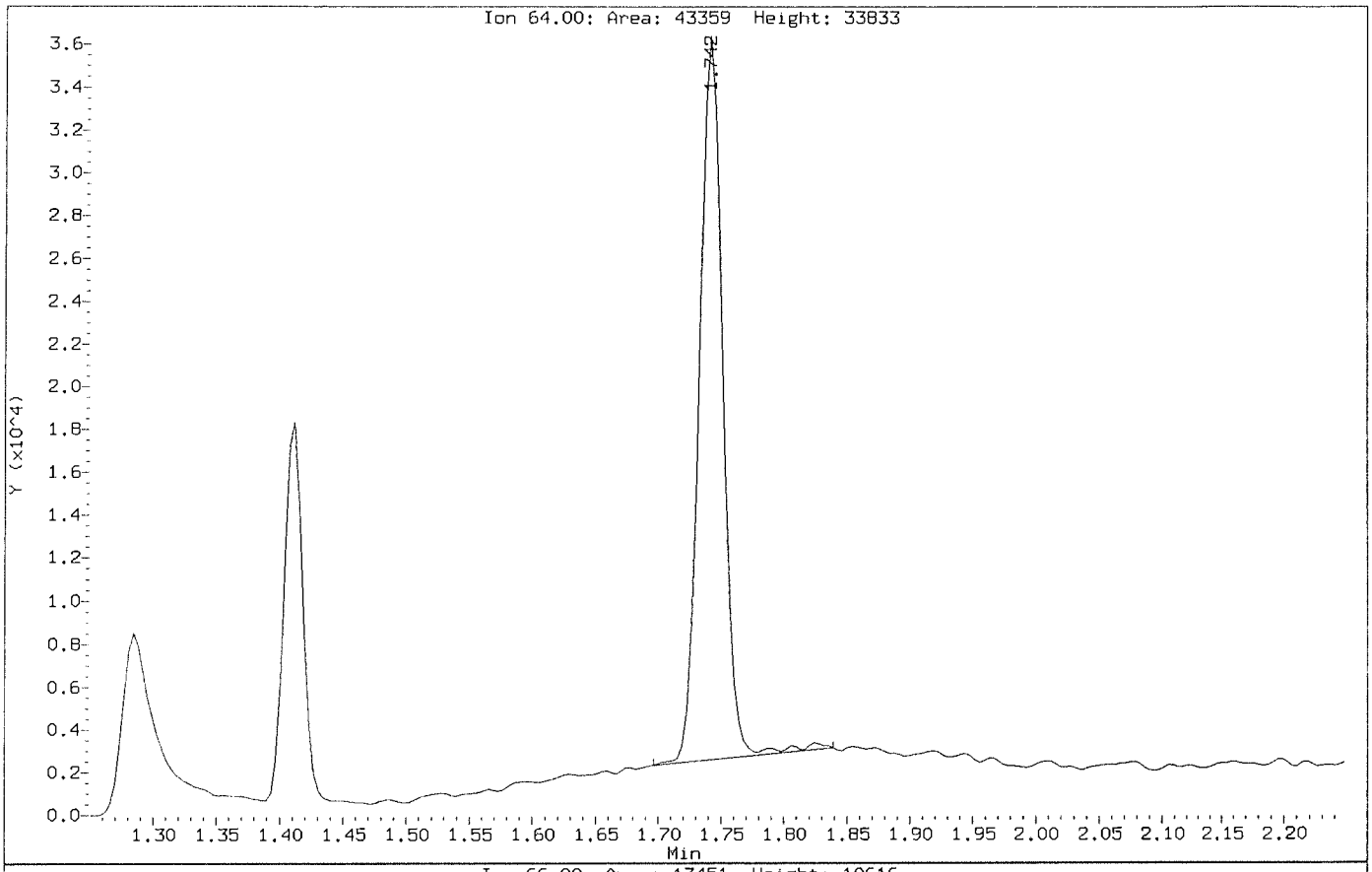
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CAS Number: 75-00-3

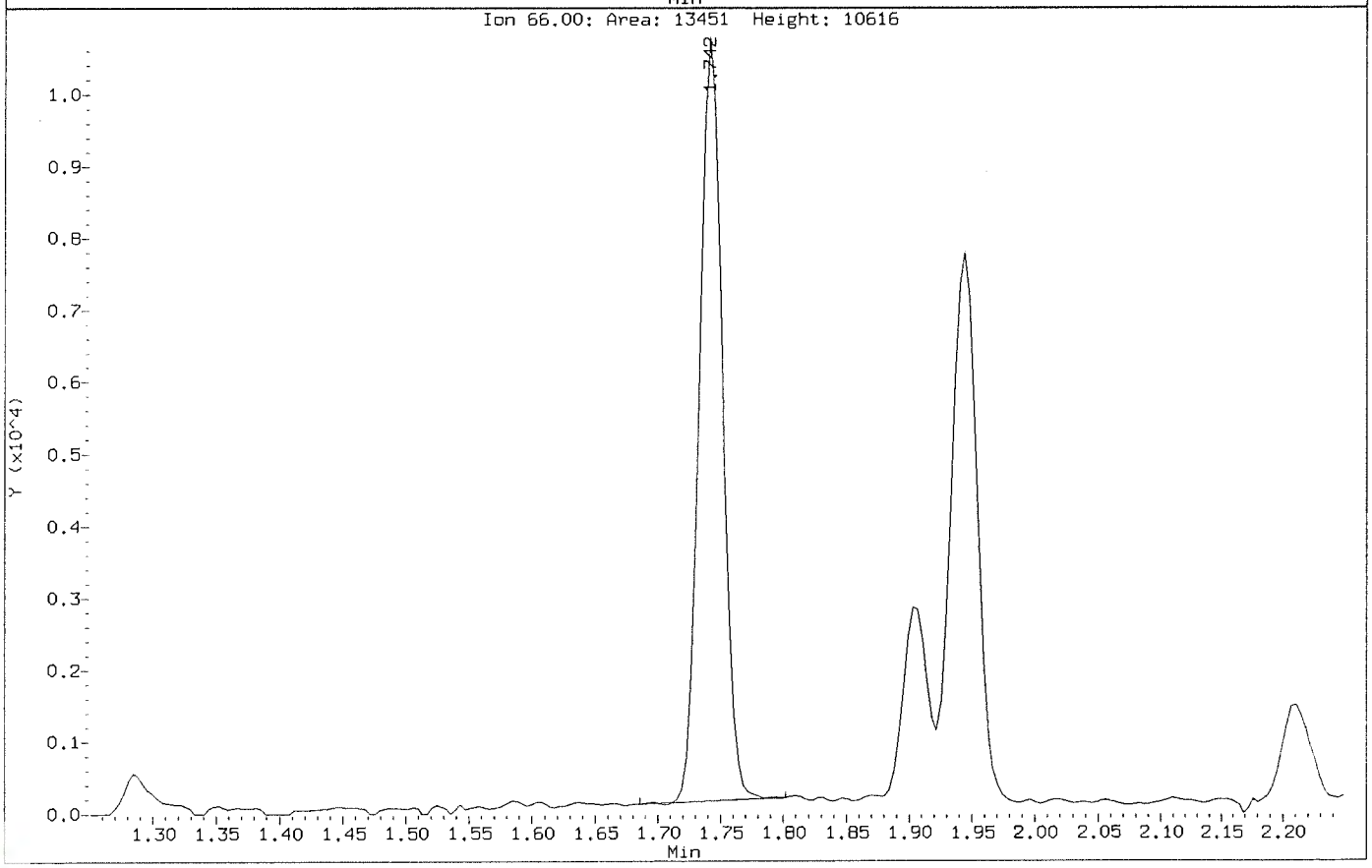




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Injection Date: 15-DEC-2021 17:41
Instrument: VOA9.i
Client Sample ID: HS21120255-05MSD

Compound: Chloroethane
CAS Number: 75-00-3





Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121518.D Page 1
Report Date: 20-Dec-2021 14:49

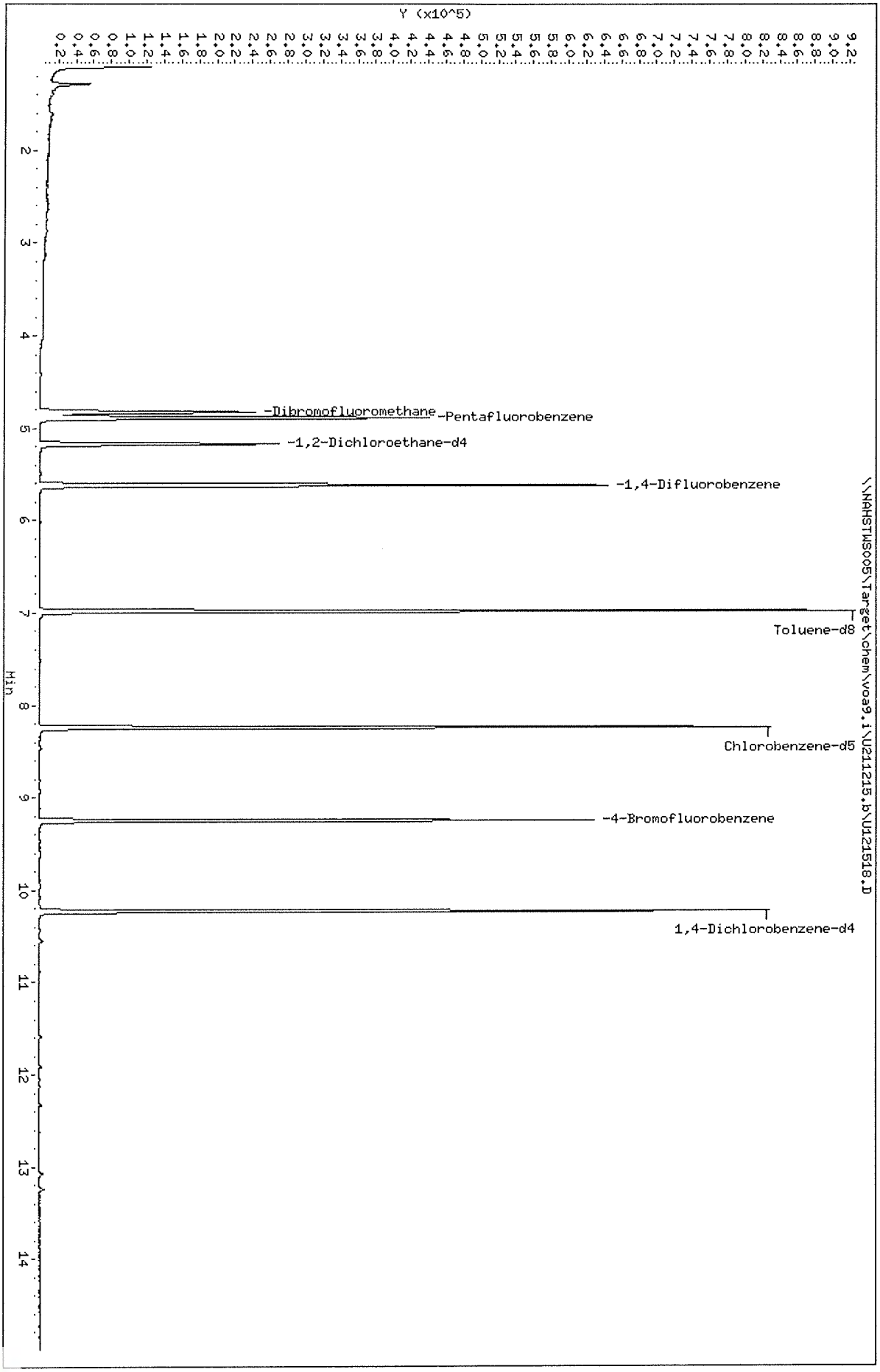
ALS Laboratory Group

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Inj Date : 15-DEC-2021 18:26
Operator : PC Inst ID: VOA9.i
Smp Info : HS21120243-06;HS21120243-06;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211215.b\8260C.m
Meth Date : 20-Dec-2021 14:47 kori.bagsb Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 16
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.886	4.886	(1.000)	262491	50.0000	
* 36 1,4-Difluorobenzene	114	5.617	5.617	(1.000)	454244	50.0000	
* 47 Chlorobenzene-d5	117	8.241	8.241	(1.000)	399353	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.225	10.224	(1.000)	185752	50.0000	
$ 30 Dibromofluoromethane	113	4.823	4.823	(0.987)	139181	50.5243	50.52
$ 35 1,2-Dichloroethane-d4	65	5.168	5.167	(1.058)	173803	54.0916	54.09
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	540466	51.9991	51.99
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	196227	50.6052	50.60



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121518.D
Date : 15-DEC-2021 18:26
Client ID: HS21120243-06
Sample Info: HS21120243-06;HS21120243-06;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121522.D Page 1
Report Date: 20-Dec-2021 14:49

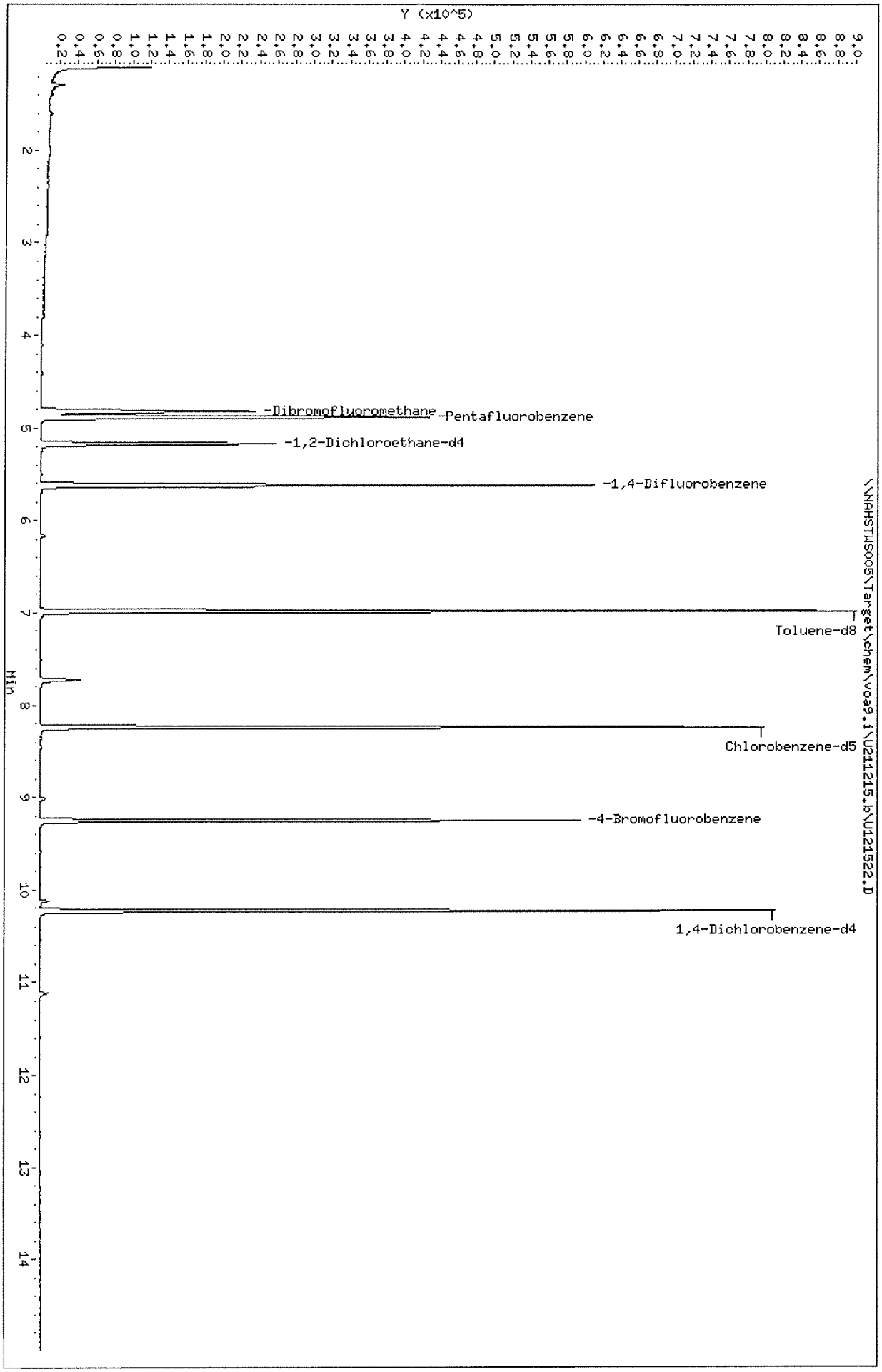
ALS Laboratory Group

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Inj Date : 15-DEC-2021 19:55
Operator : PC Inst ID: VOA9.i
Smp Info : HS21120243-01;HS21120243-01;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
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Meth Date : 20-Dec-2021 14:47 kori.bagsb Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 20
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.883	4.886	(1.000)	250588	50.0000	
* 36 1,4-Difluorobenzene	114	5.618	5.617	(1.000)	438094	50.0000	
* 47 Chlorobenzene-d5	117	8.242	8.241	(1.000)	388274	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.225	10.224	(1.000)	181244	50.0000	
$ 30 Dibromofluoromethane	113	4.819	4.823	(0.987)	130930	49.7742	49.77
$ 35 1,2-Dichloroethane-d4	65	5.168	5.167	(1.058)	166552	54.3028	54.30
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	524905	51.9430	51.94
$ 69 4-Bromofluorobenzene	95	9.250	9.246	(1.122)	189424	50.2351	50.23



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121522.D
Date : 15-DEC-2021 19:55
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Purge Volume: 5.0
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Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

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Report Date: 20-Dec-2021 14:49

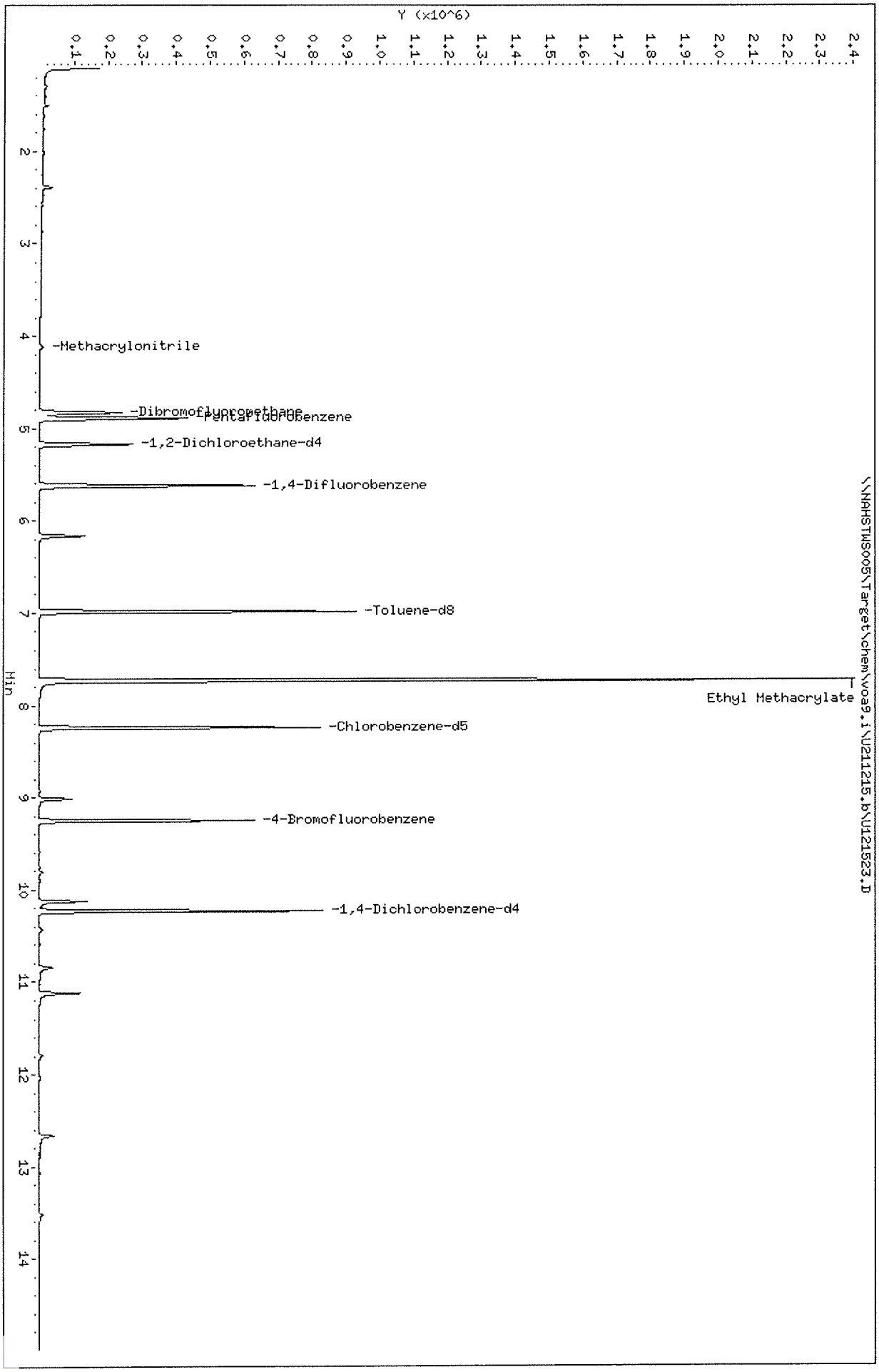
ALS Laboratory Group

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Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211215.b\8260C.m
Meth Date : 20-Dec-2021 14:47 kori.bagsb Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 21
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.890	4.886	(1.000)	258042	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.617	(1.000)	447469	50.0000	
* 47 Chlorobenzene-d5	117	8.242	8.241	(1.000)	400061	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.225	10.224	(1.000)	189284	50.0000	
$ 30 Dibromofluoromethane	113	4.827	4.823	(0.987)	136356	50.3493	50.34
$ 35 1,2-Dichloroethane-d4	65	5.171	5.167	(1.057)	175501	55.6025	55.60
$ 48 Toluene-d8	98	6.982	6.978	(0.847)	539490	51.8133	51.81
$ 69 4-Bromofluorobenzene	95	9.250	9.246	(1.122)	199145	51.2844	51.28



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121523.D
Date : 15-DEC-2021 20:17
Client ID: HS21120243-03
Sample Info: HS21120243-03;HS21120243-03;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121524.D
Lab Smp Id: HS21120243-04 Client Smp ID: HS21120243-04
Inj Date : 15-DEC-2021 20:40
Operator : PC Inst ID: VOA9.i
Smp Info : HS21120243-04;HS21120243-04;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211215.b\8260C.m
Meth Date : 20-Dec-2021 14:47 kori.bagsb Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 22
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

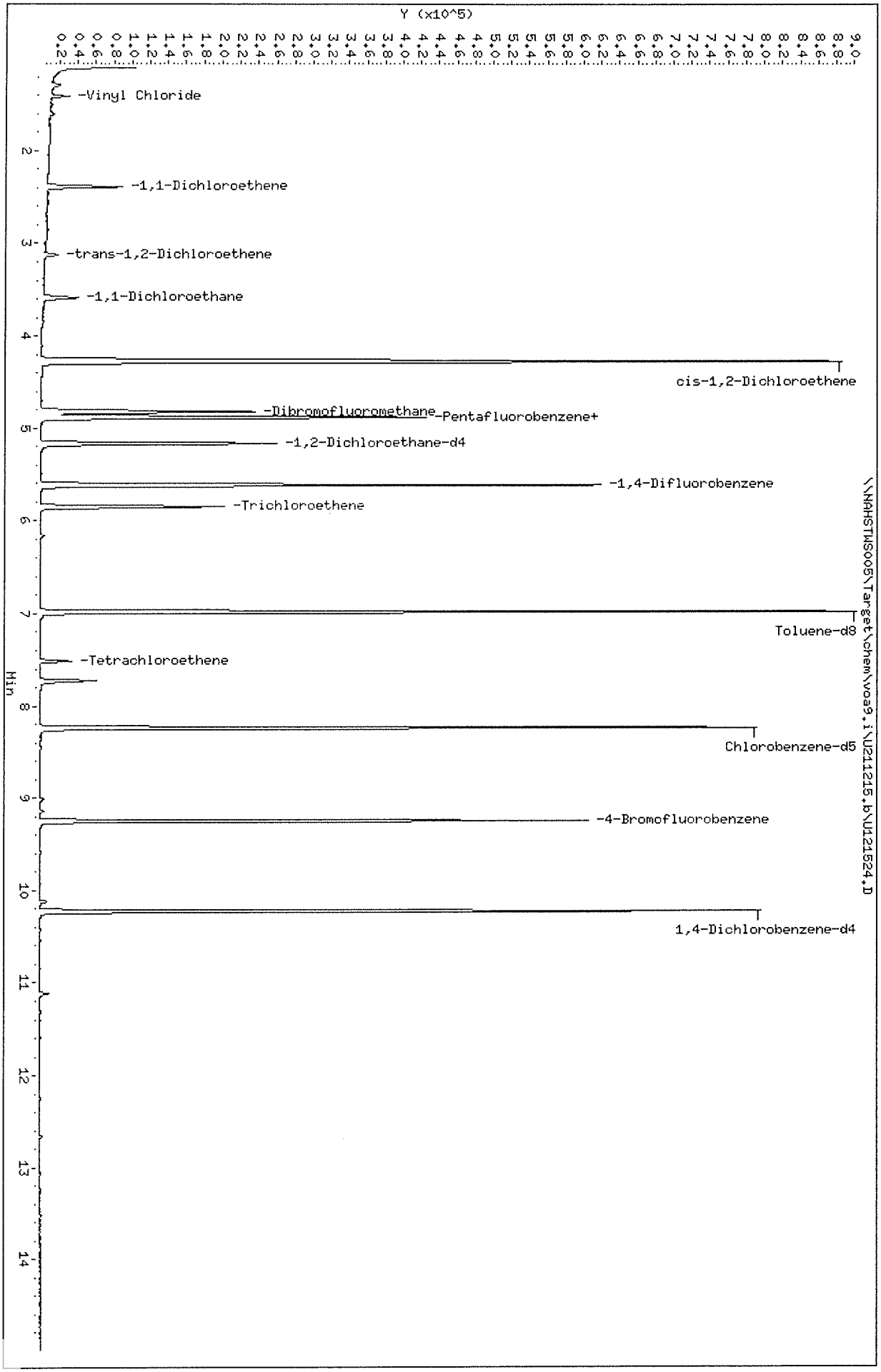
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
*	1 Pentafluorobenzene	168	4.883	4.886	(1.000)	251702	50.0000	
*	36 1,4-Difluorobenzene	114	5.614	5.617	(1.000)	435132	50.0000	
*	47 Chlorobenzene-d5	117	8.242	8.241	(1.000)	389211	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.225	10.224	(1.000)	179493	50.0000	
$	30 Dibromofluoromethane	113	4.819	4.823	(0.987)	131936	49.9374	49.93
$	35 1,2-Dichloroethane-d4	65	5.164	5.167	(1.058)	167475	54.3637	54.36
$	48 Toluene-d8	98	6.978	6.978	(0.847)	524019	51.7305	51.73
$	69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	189342	50.0887	50.08
	22 1,1-Dichloroethane	63	3.586	3.593	(0.734)	38014	8.50107	8.50
	11 1,1-Dichloroethene	96	2.390	2.393	(0.490)	26807	11.9456	11.94
	27 cis-1,2-Dichloroethene	96	4.272	4.275	(0.875)	415760	135.199	135.19
	56 Tetrachloroethene	164	7.511	7.514	(0.911)	6630	3.02045	3.02(a)
	20 trans-1,2-Dichloroethene	96	3.125	3.132	(0.640)	4890	1.93169	1.93(a)
	38 Trichloroethene	130	5.850	5.853	(1.042)	58556	20.5988	20.59
	5 Vinyl Chloride	62	1.408	1.415	(0.288)	12927	4.24655	4.24(a)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).



Data File: \\NAHSTWS005\Target\chem\voa9,i\U211215,b\U121524,D
Date : 15-DEC-2021 20:40
Client ID: HS211202 43-04
Sample Info: HS211202 43-04;HS211202 43-04;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

\\NAHSTWS005\Target\chem\voa9,i\U211215,b\U121524,D

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121524.D Page 3

Date : 15-DEC-2021 20:40

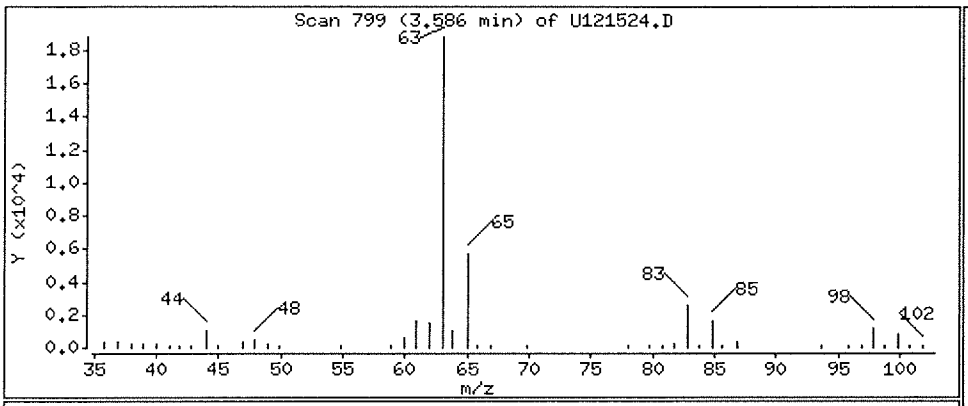
Client ID: HS21120243-04 Instrument: VOA9.i

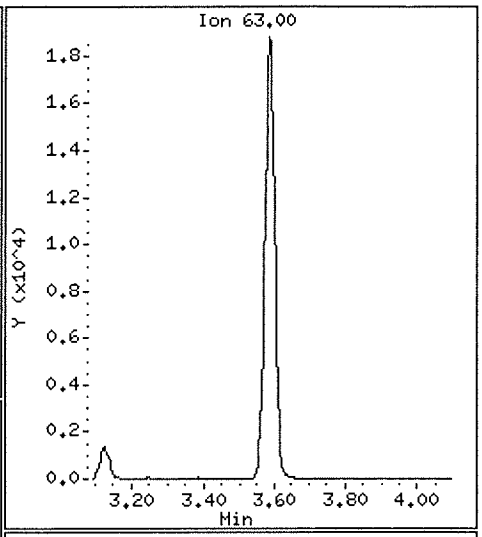
Sample Info: HS21120243-04;HS21120243-04;;;

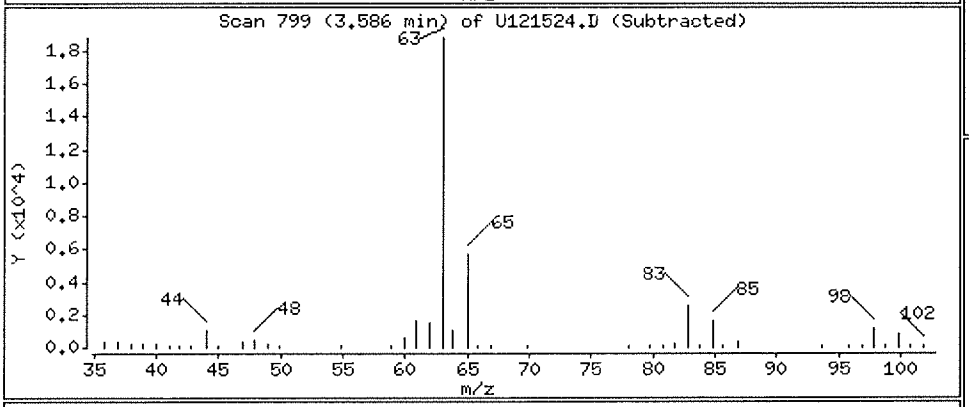
Purge Volume: 5.0 Operator: PC

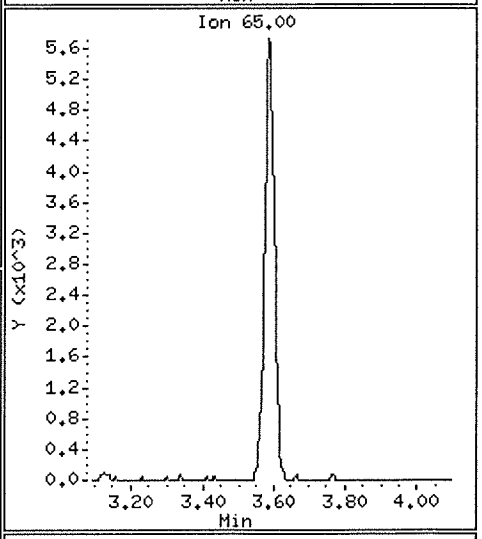
Column phase: DB624 Column diameter: 0.18

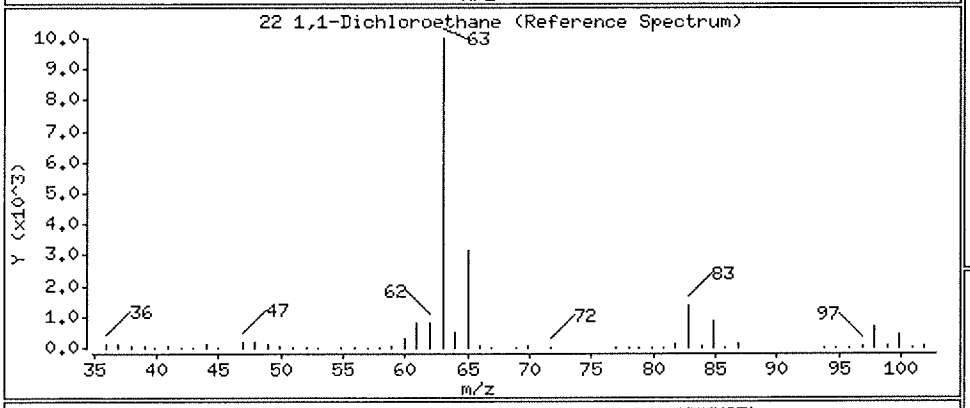
22 1,1-Dichloroethane Concentration: 8.50 ug/l

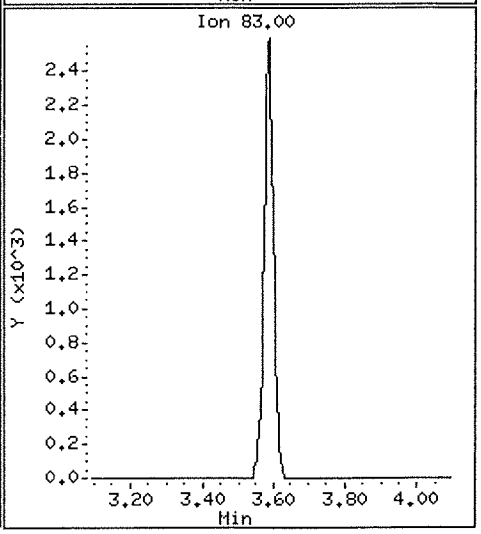


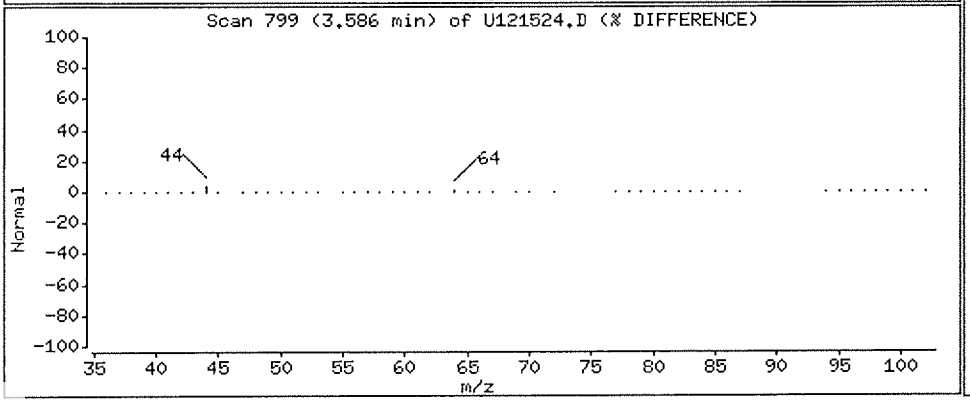












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121524.D

Date : 15-DEC-2021 20:40

Client ID: HS21120243-04

Instrument: VOA9.i

Sample Info: HS21120243-04;HS21120243-04;;;

Purge Volume: 5.0

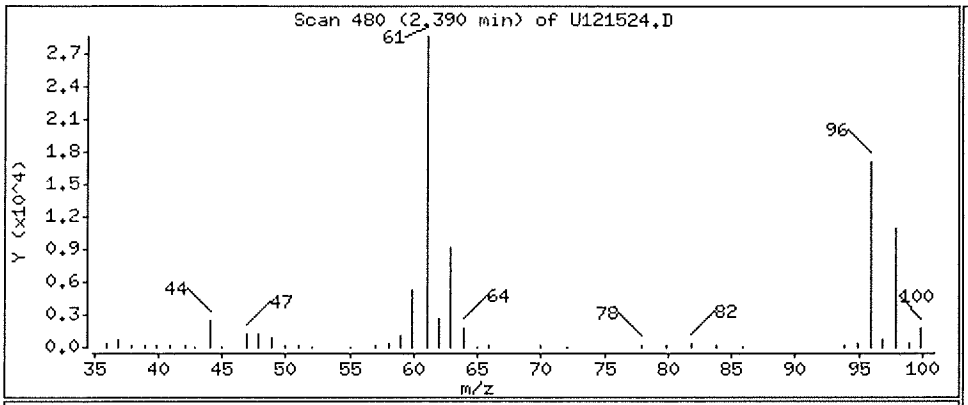
Operator: PC

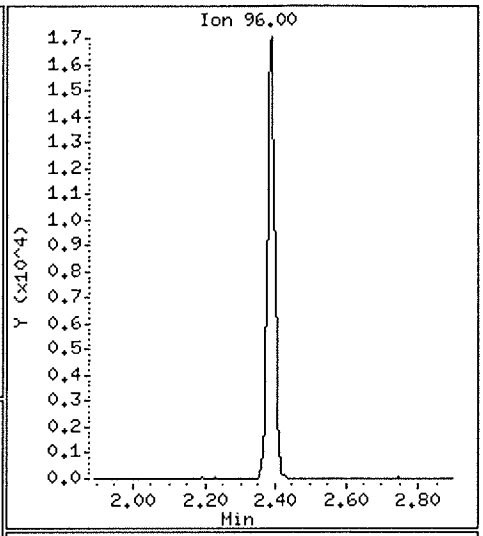
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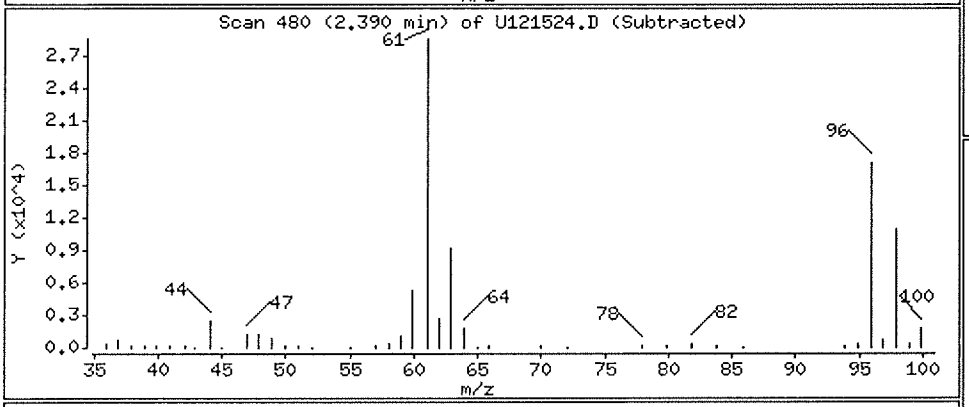
Column diameter: 0.18

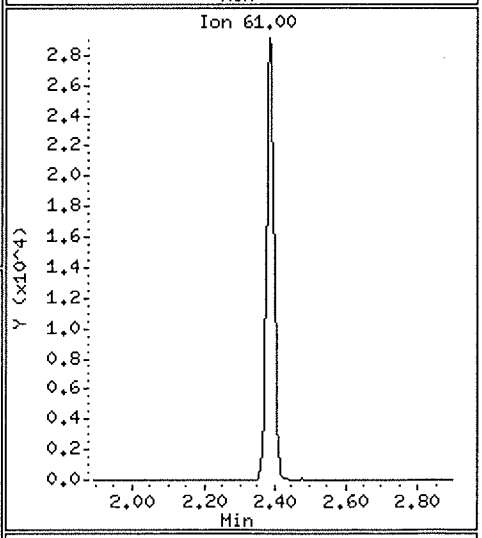
11 1,1-Dichloroethene

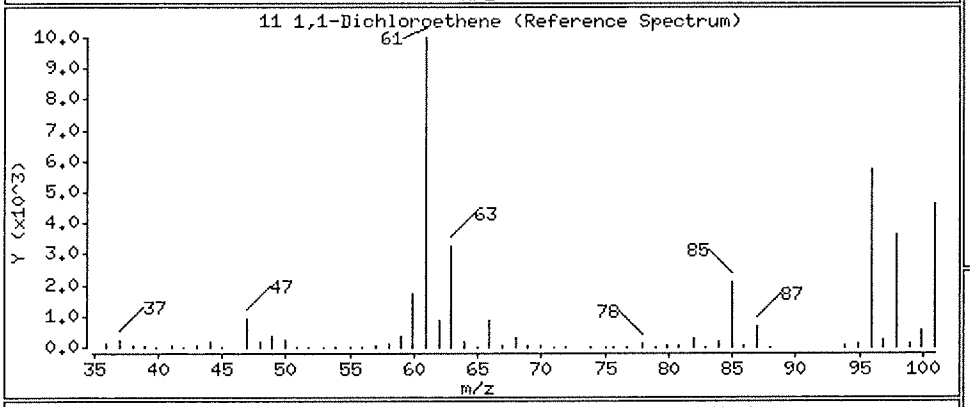
Concentration: 11.94 ug/l

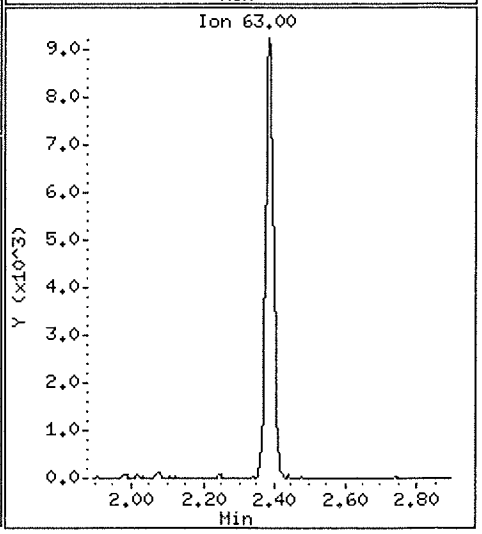


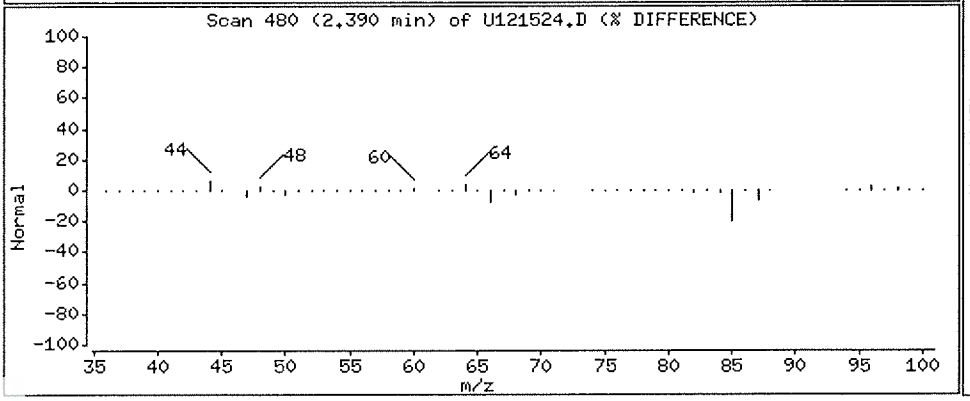












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121524.D Page 5

Date : 15-DEC-2021 20:40

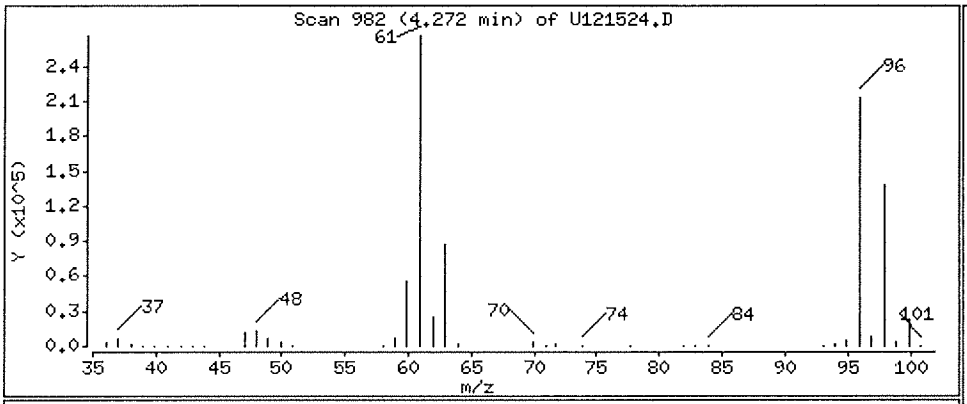
Client ID: HS21120243-04 Instrument: VOA9.i

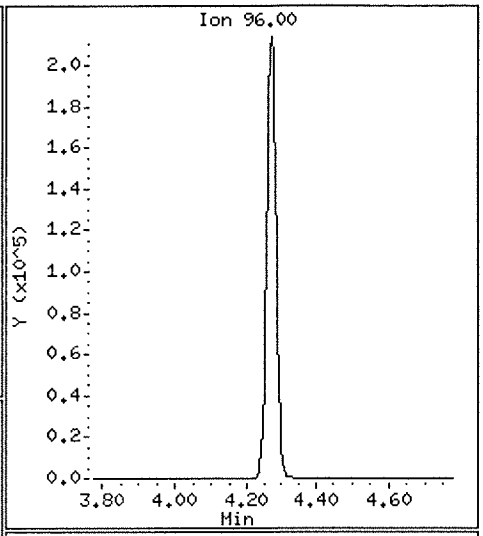
Sample Info: HS21120243-04;HS21120243-04;;;

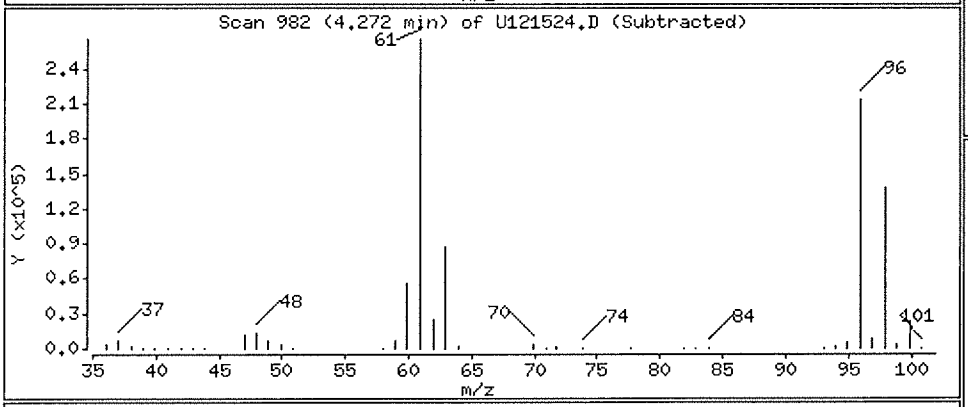
Purge Volume: 5.0 Operator: PC

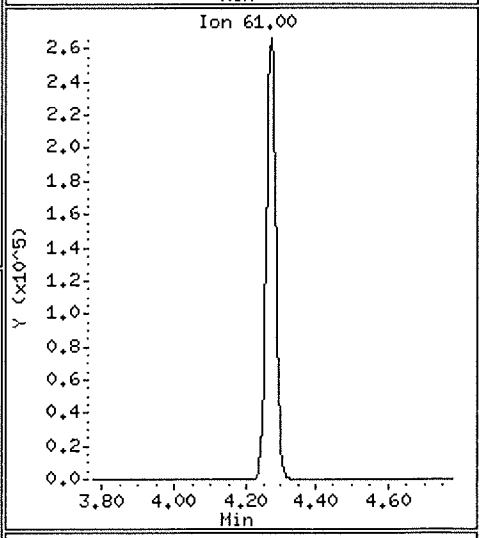
Column phase: DB624 Column diameter: 0.18

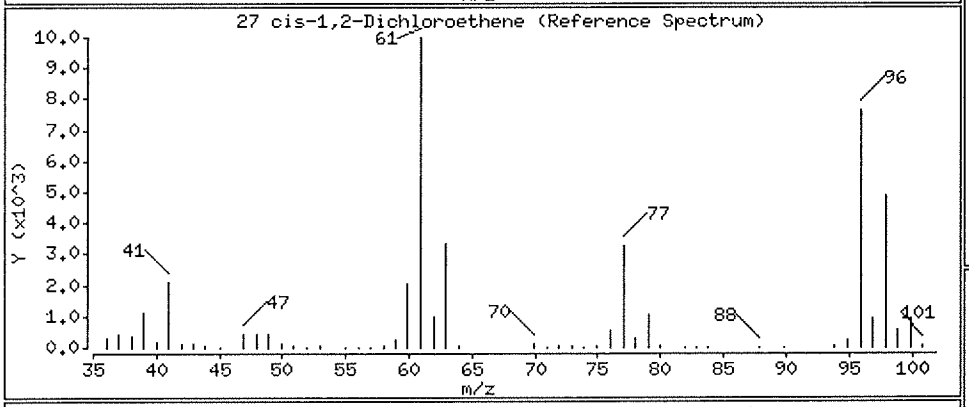
27 cis-1,2-Dichloroethene Concentration: 135.19 ug/l

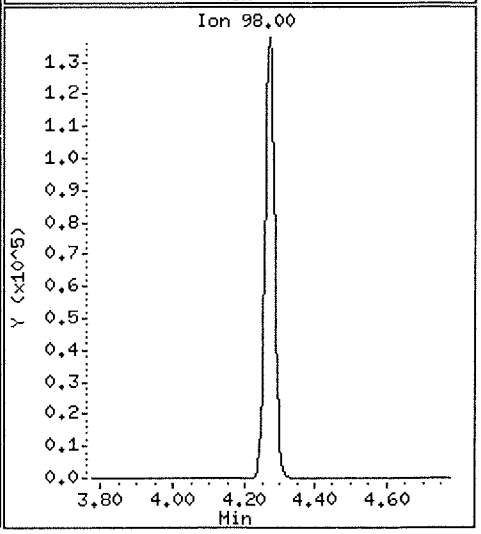


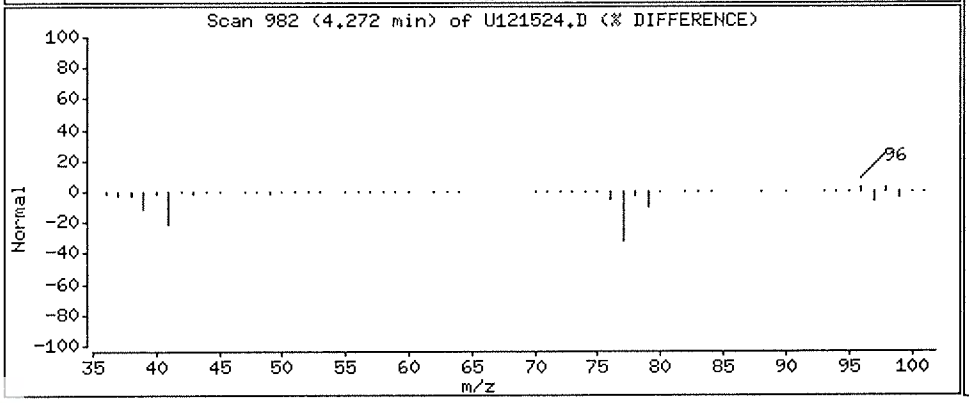












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121524.D

Date : 15-DEC-2021 20:40

Client ID: HS21120243-04

Instrument: VOA9.i

Sample Info: HS21120243-04;HS21120243-04;;;

Purge Volume: 5.0

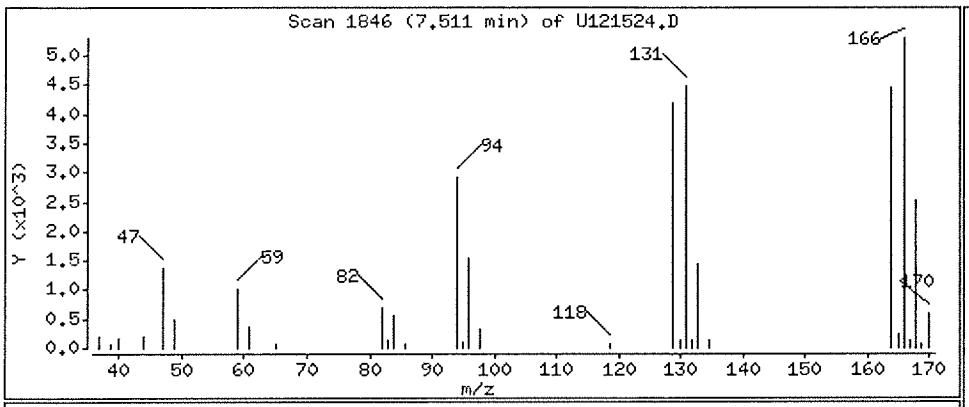
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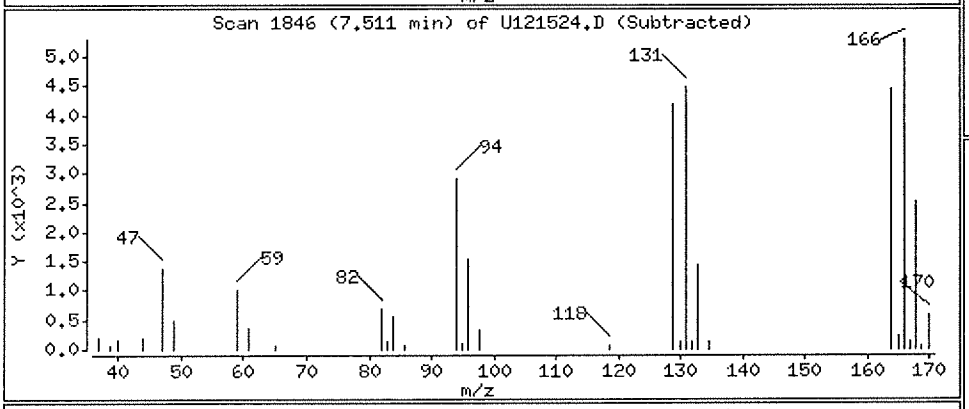
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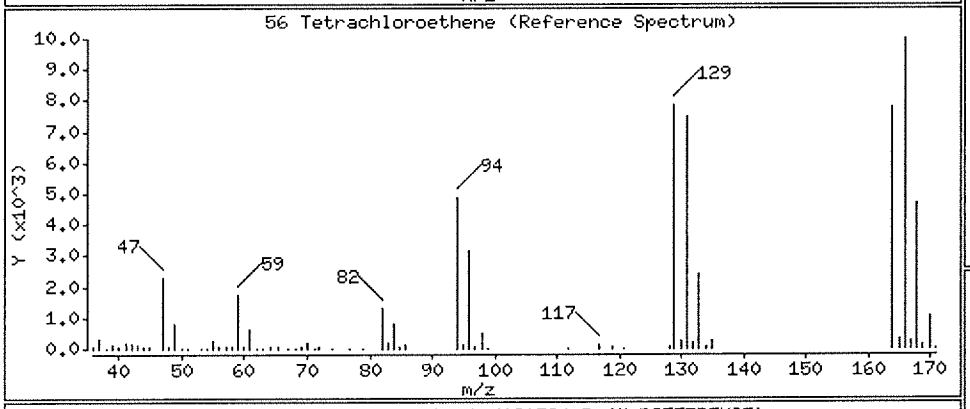
Column diameter: 0.18

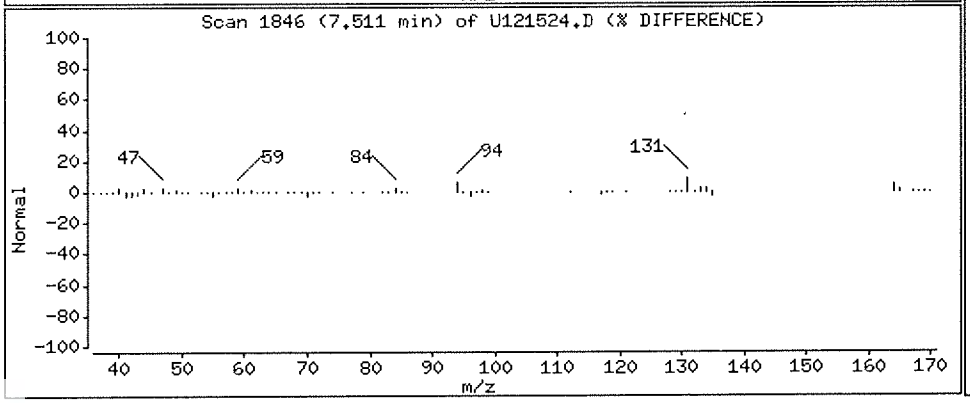
56 Tetrachloroethene

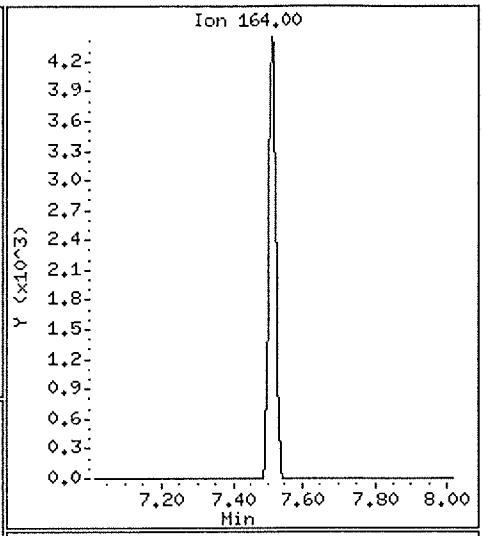
Concentration: 3.02 ug/l

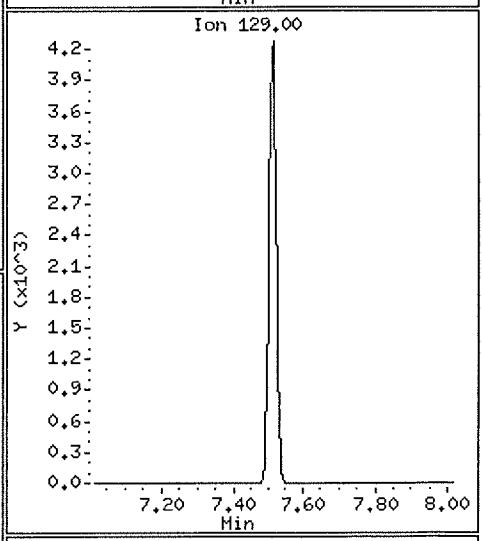


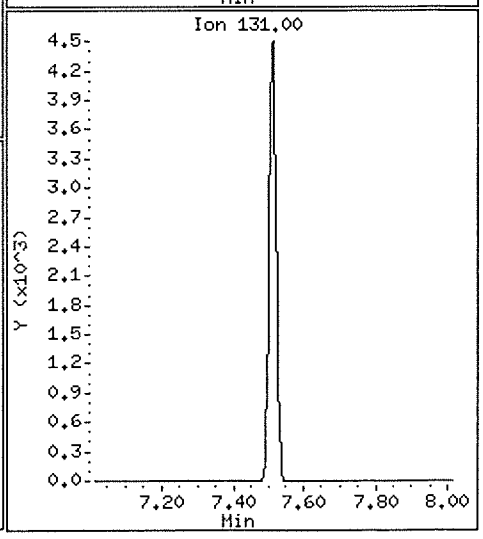












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121524.D

Date : 15-DEC-2021 20:40

Client ID: HS21120243-04

Instrument: VOA9.i

Sample Info: HS21120243-04;HS21120243-04;;;

Purge Volume: 5.0

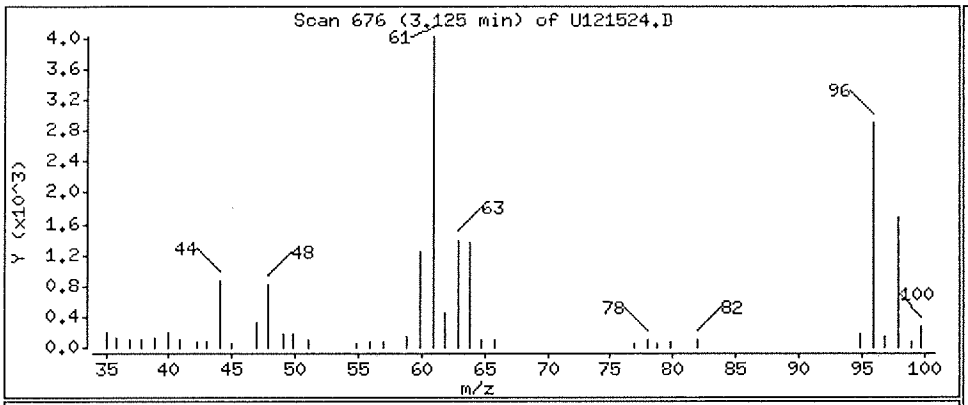
Operator: PC

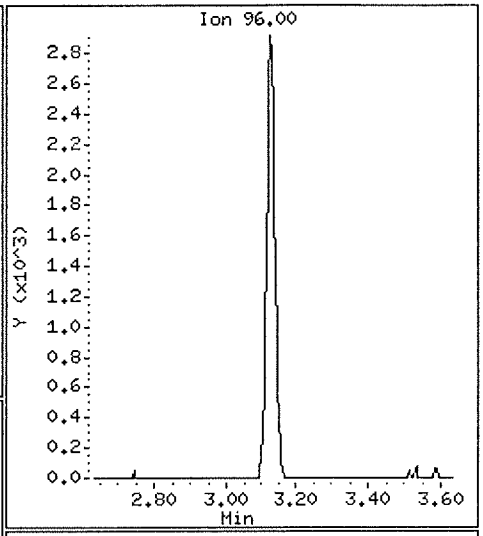
Column phase: DB624

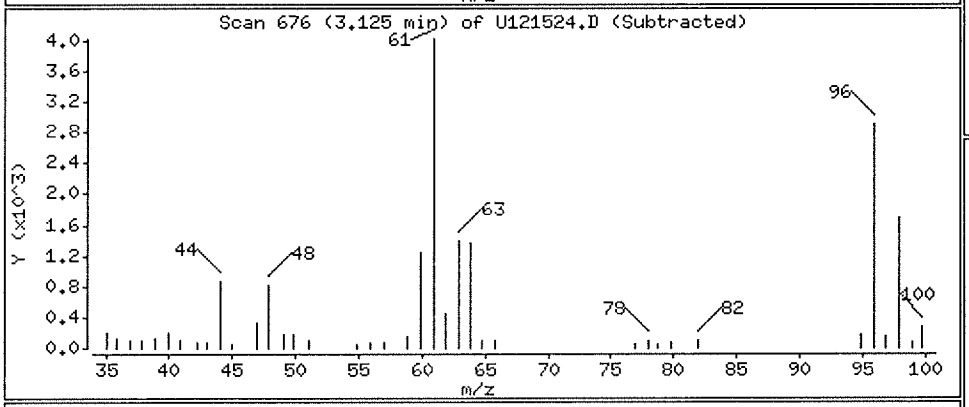
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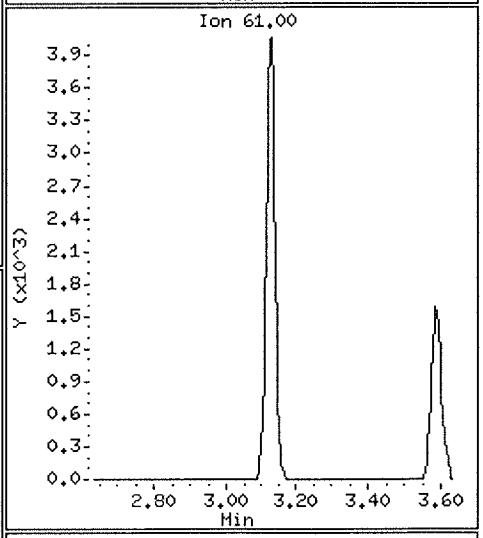
20 trans-1,2-Dichloroethene

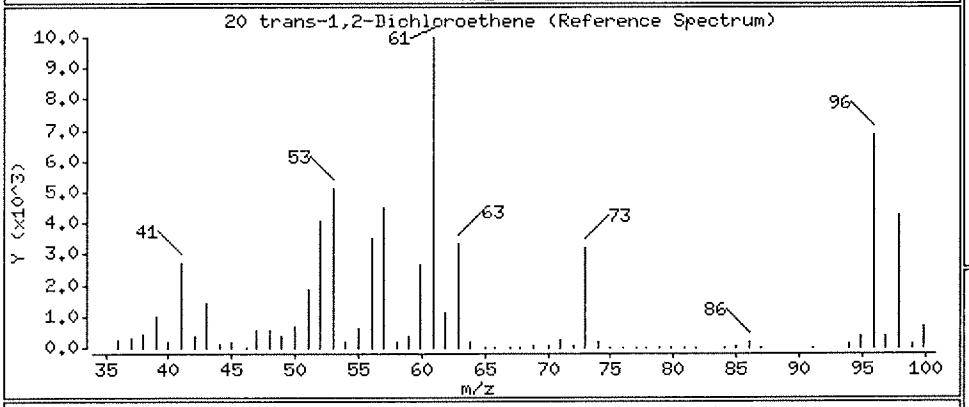
Concentration: 1.93 ug/l

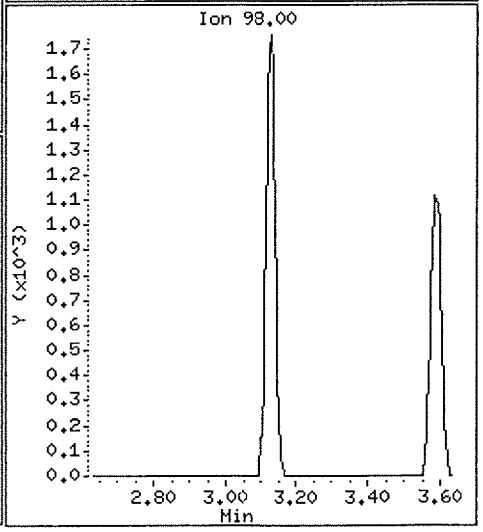


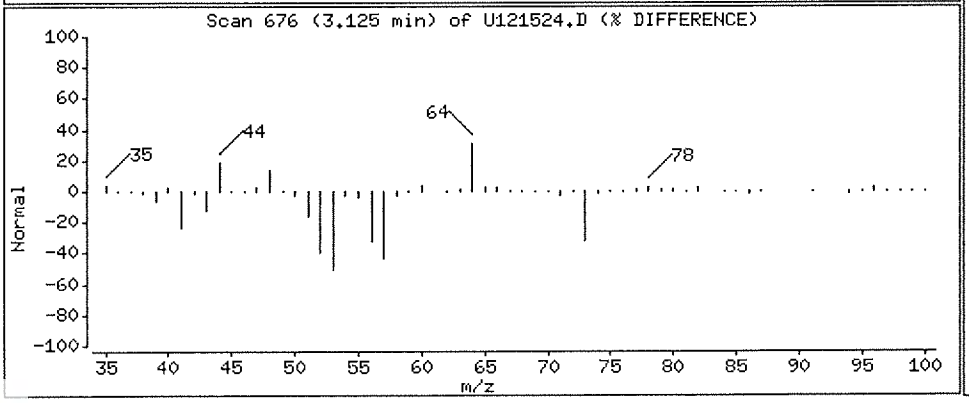












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121524.D Page 8

Date : 15-DEC-2021 20:40

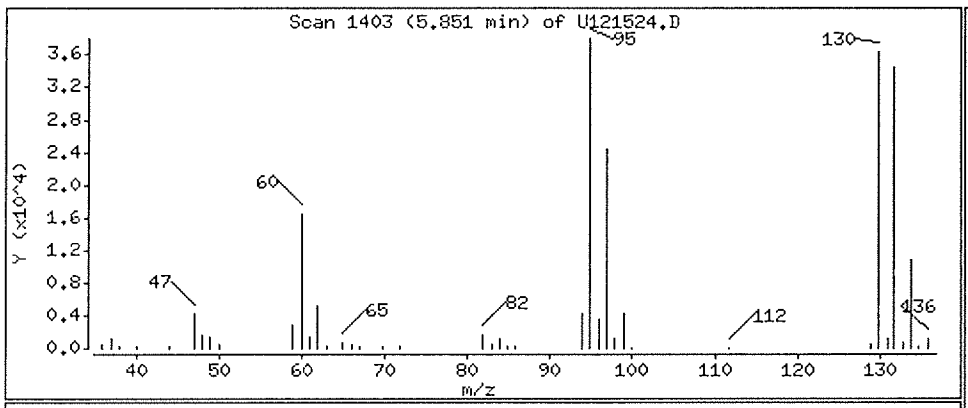
Client ID: HS21120243-04 Instrument: VOA9.i

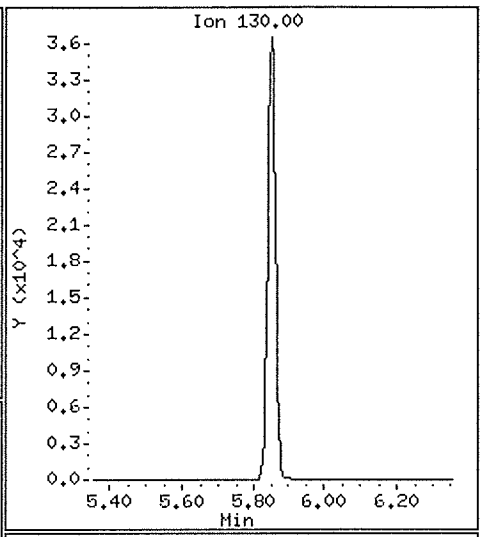
Sample Info: HS21120243-04;HS21120243-04;;;

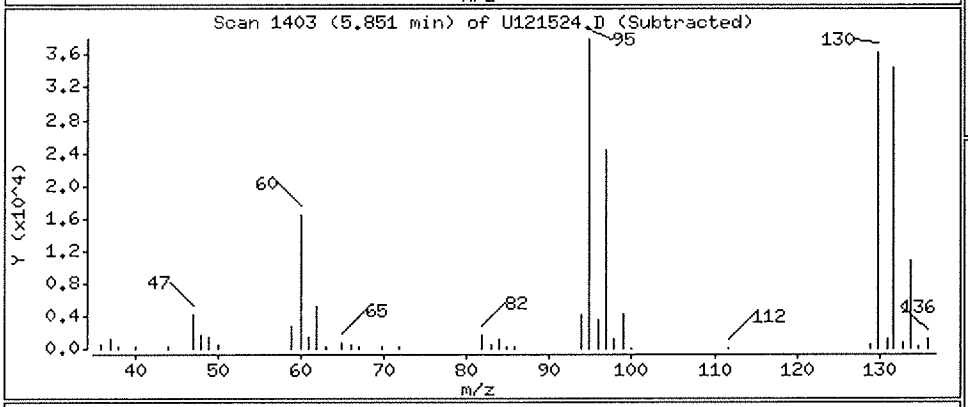
Purge Volume: 5.0 Operator: PC

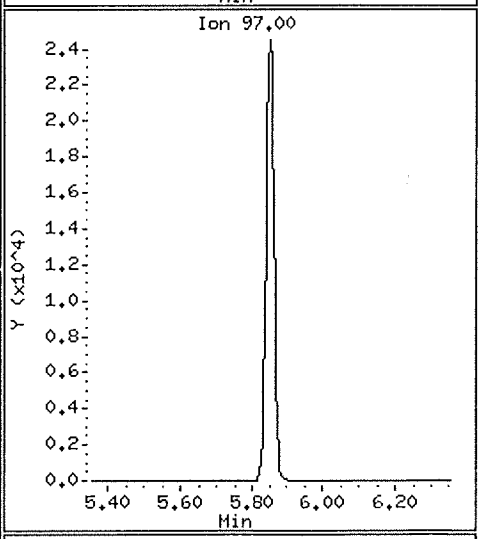
Column phase: DB624 Column diameter: 0.18

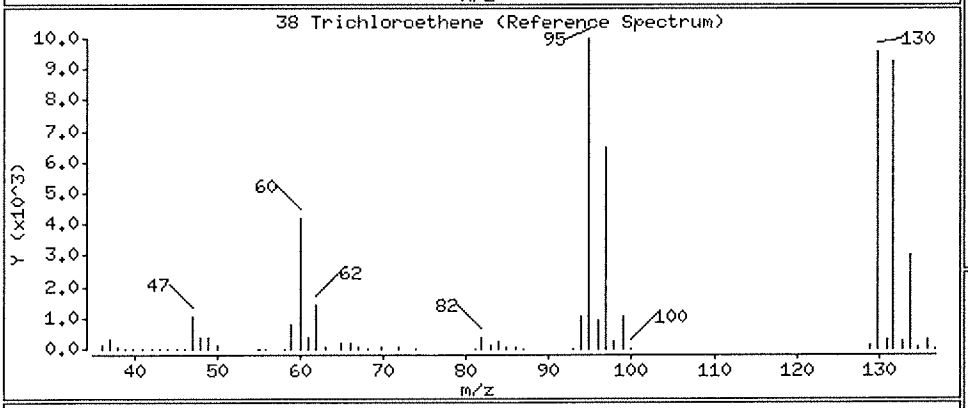
38 Trichloroethene Concentration: 20.59 ug/l

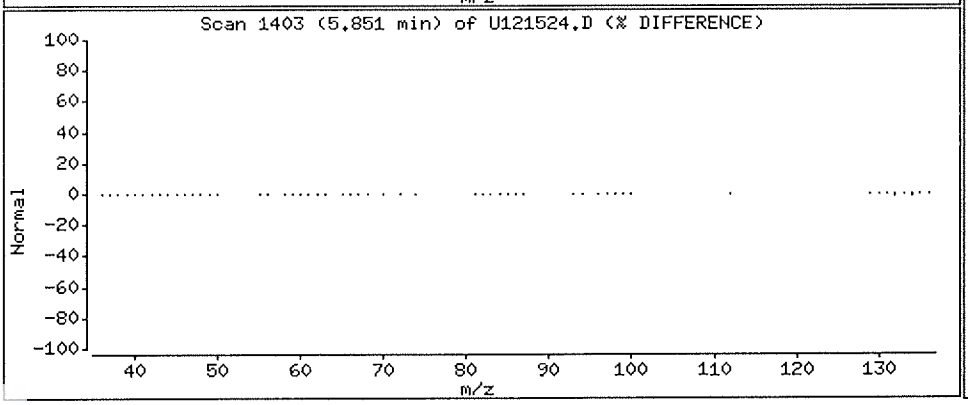


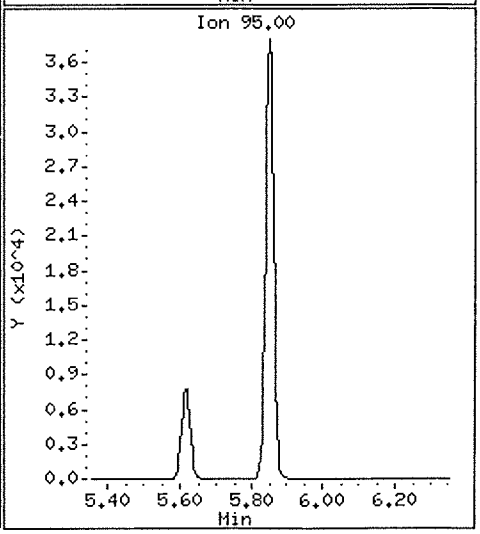












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121524.D

Date : 15-DEC-2021 20:40

Client ID: HS21120243-04

Instrument: VOA9.i

Sample Info: HS21120243-04;HS21120243-04;;;

Purge Volume: 5.0

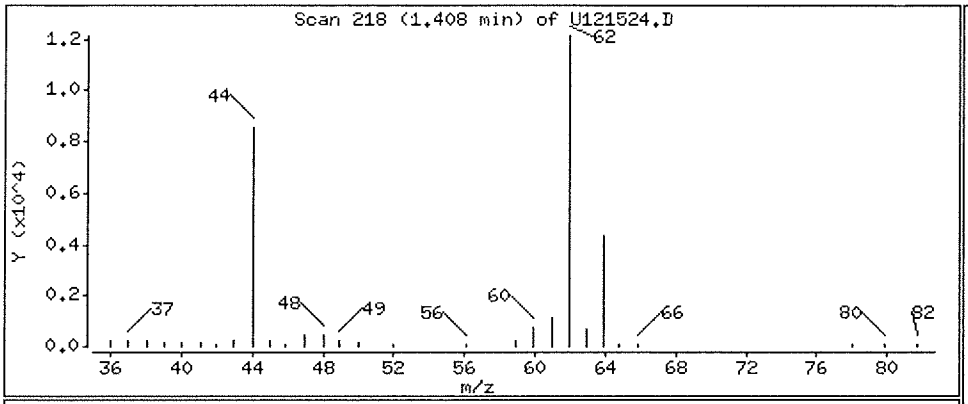
Operator: PC

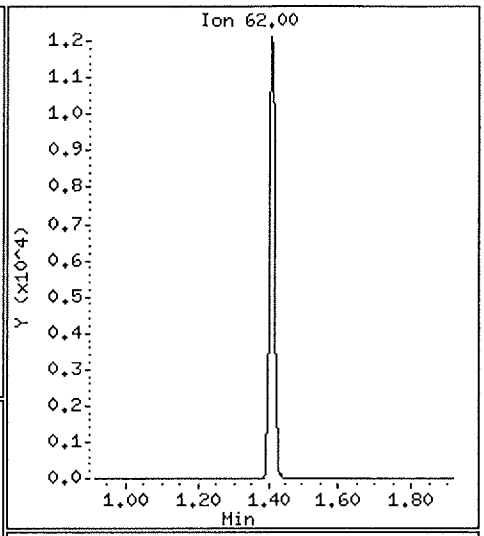
Column phase: DB624

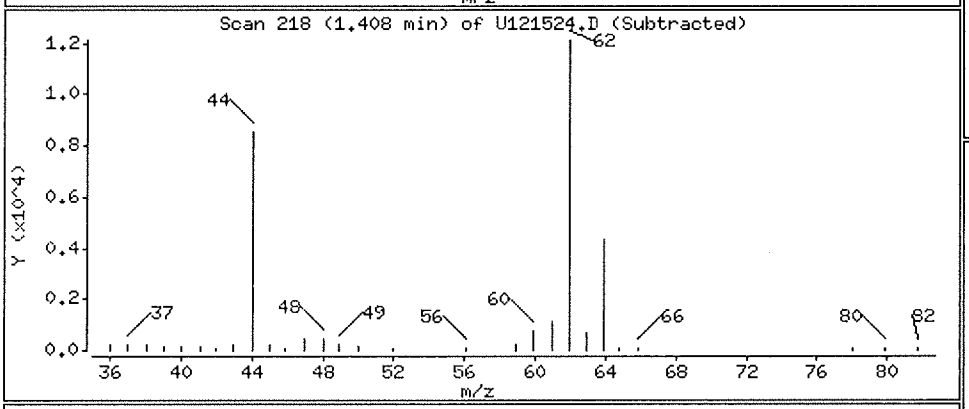
Column diameter: 0.18

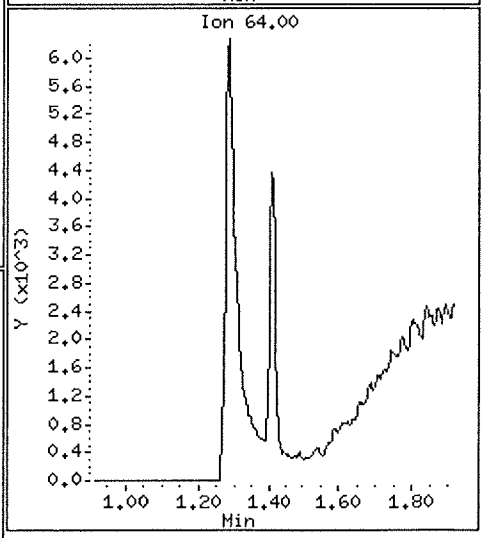
5 Vinyl Chloride

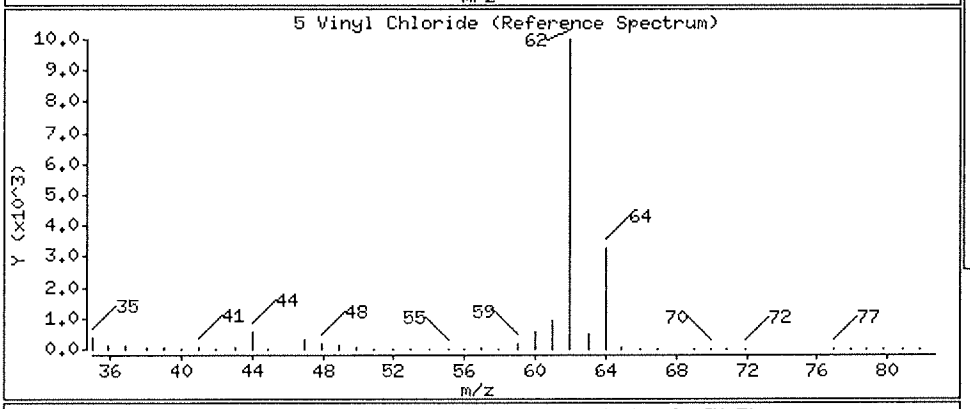
Concentration: 4.24 ug/l

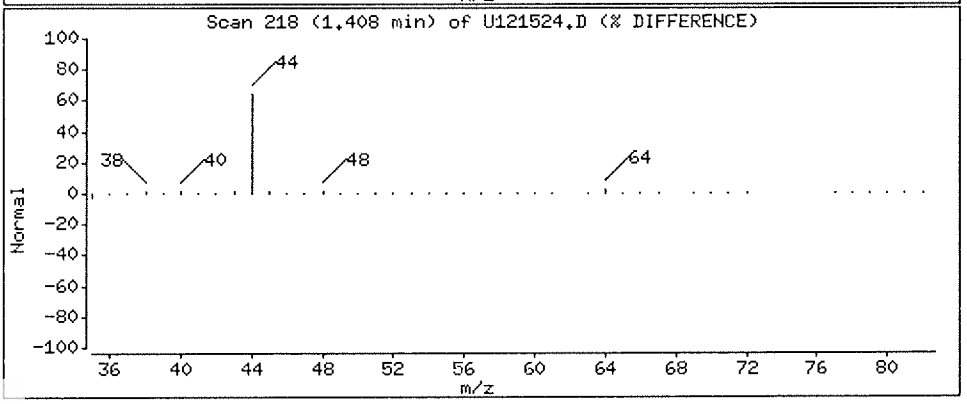












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121525.D Page 1
Report Date: 20-Dec-2021 14:49

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121525.D
Lab Smp Id: HS21120243-05 Client Smp ID: HS21120243-05
Inj Date : 15-DEC-2021 21:02
Operator : PC Inst ID: VOA9.i
Smp Info : HS21120243-05;HS21120243-05;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211215.b\8260C.m
Meth Date : 20-Dec-2021 14:47 kori.bagsb Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 23
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

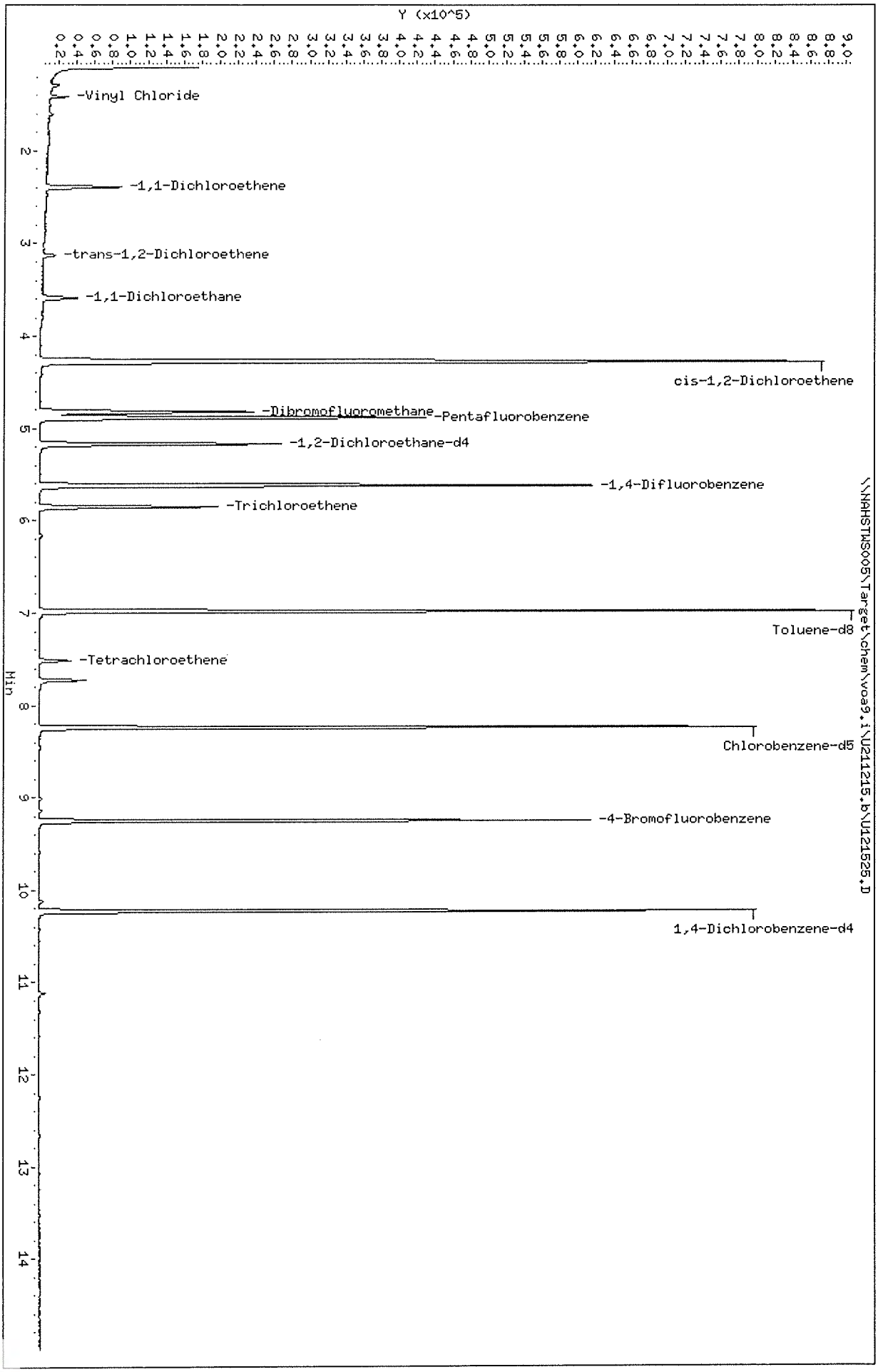
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.883	4.886	(1.000)	254744	50.0000	
* 36 1,4-Difluorobenzene	114	5.617	5.617	(1.000)	440460	50.0000	
* 47 Chlorobenzene-d5	117	8.241	8.241	(1.000)	390010	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.224	10.224	(1.000)	179940	50.0000	
$ 30 Dibromofluoromethane	113	4.819	4.823	(0.987)	133425	49.8972	49.89
$ 35 1,2-Dichloroethane-d4	65	5.168	5.167	(1.058)	169296	54.2968	54.29
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	524645	51.6862	51.68
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	190112	50.1920	50.19
22 1,1-Dichloroethane	63	3.589	3.593	(0.735)	37911	8.37679	8.37
11 1,1-Dichloroethene	96	2.390	2.393	(0.489)	27274	12.0086	12.00
27 cis-1,2-Dichloroethene	96	4.275	4.275	(0.876)	412721	132.608	132.60
56 Tetrachloroethene	164	7.514	7.514	(0.912)	6985	3.17566	3.17(a)
20 trans-1,2-Dichloroethene	96	3.128	3.132	(0.641)	4882	1.90550	1.90(a)
38 Trichloroethene	130	5.850	5.853	(1.041)	58410	20.2989	20.29
5 Vinyl Chloride	62	1.411	1.415	(0.289)	13142	4.26562	4.26(a)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121525.D
Date : 15-DEC-2021 21:02
Client ID: HS21120243-05
Sample Info: HS21120243-05;HS21120243-05;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121525.D Page 3

Date : 15-DEC-2021 21:02

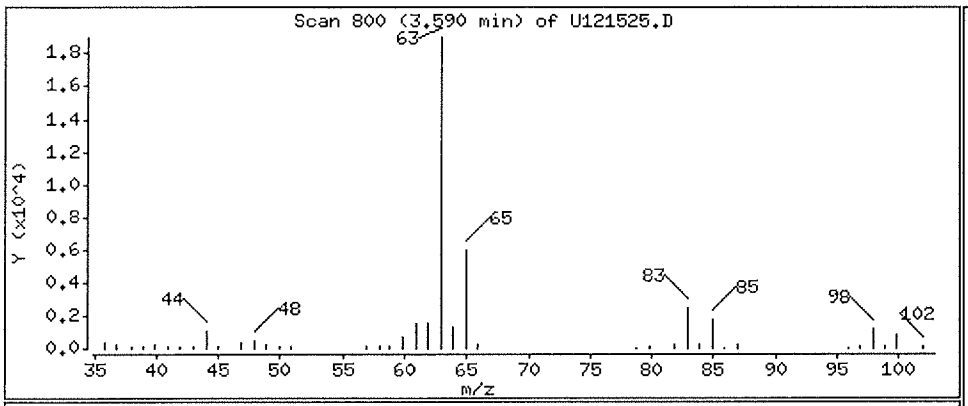
Client ID: HS21120243-05 Instrument: VOA9.i

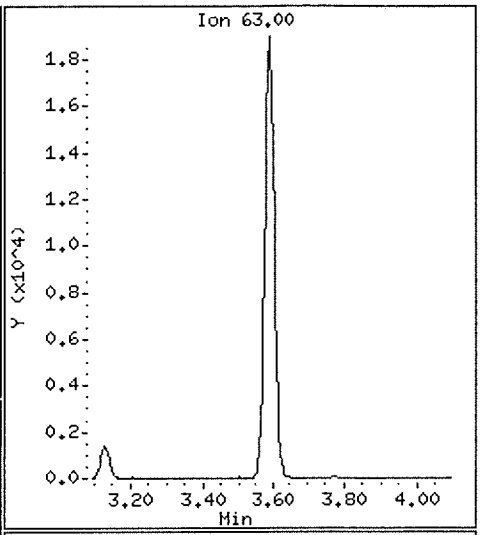
Sample Info: HS21120243-05;HS21120243-05;;;

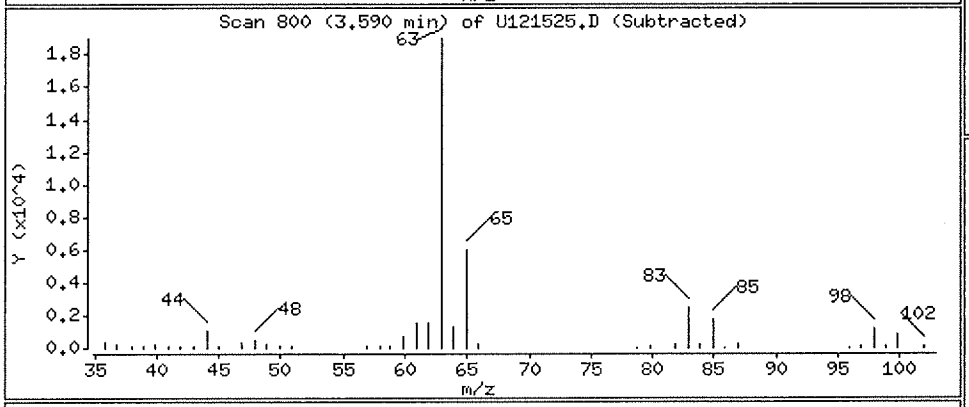
Purge Volume: 5.0 Operator: PC

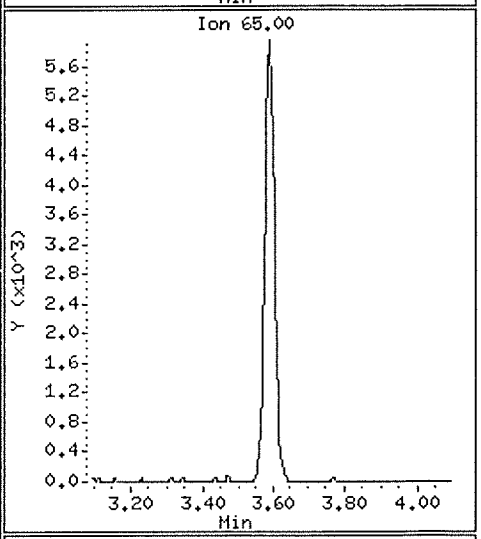
Column phase: DB624 Column diameter: 0.18

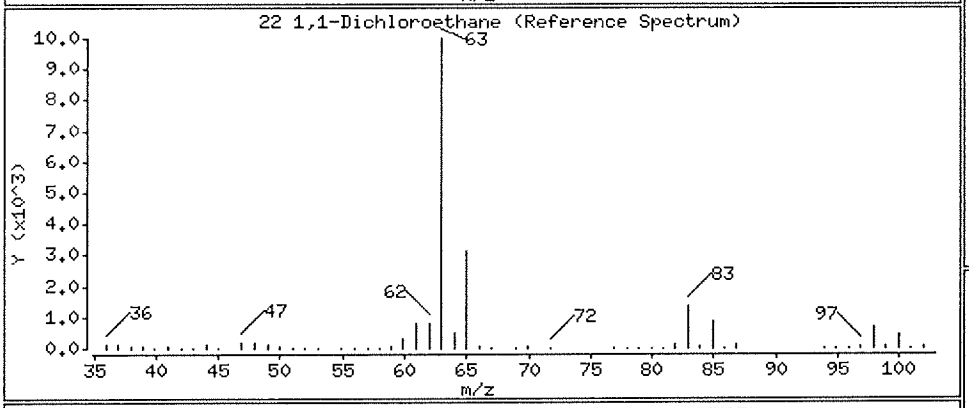
22 1,1-Dichloroethane Concentration: 8.37 ug/l

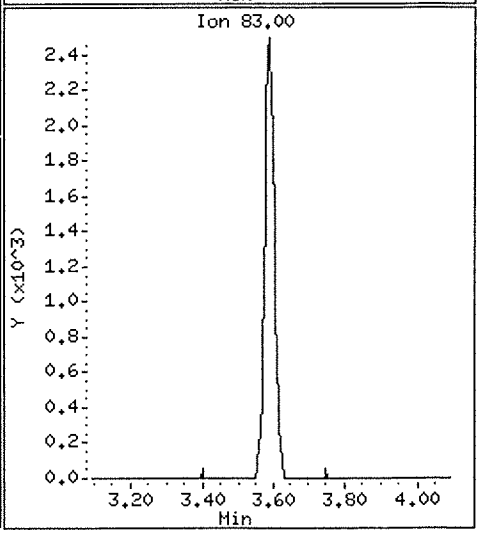


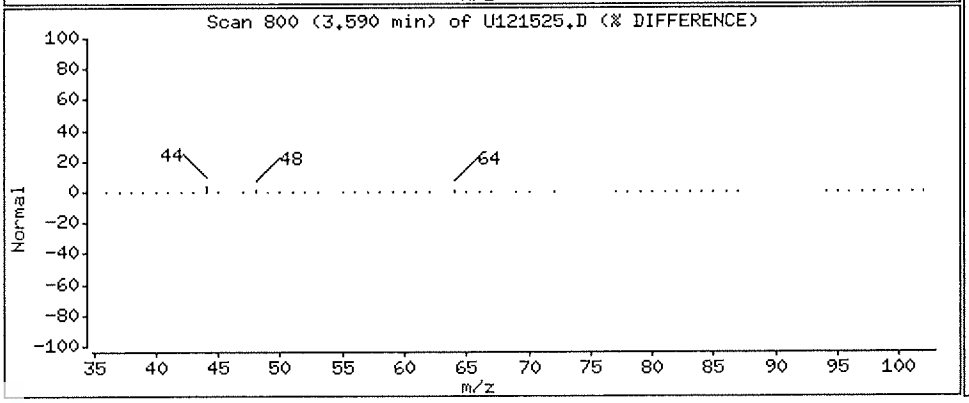












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121525.D

Date : 15-DEC-2021 21:02

Client ID: HS21120243-05

Instrument: VOA9.i

Sample Info: HS21120243-05;HS21120243-05;;;

Purge Volume: 5.0

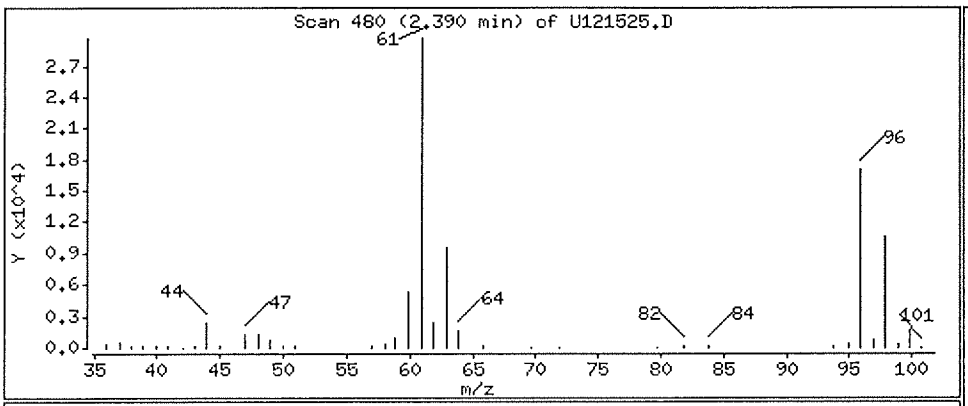
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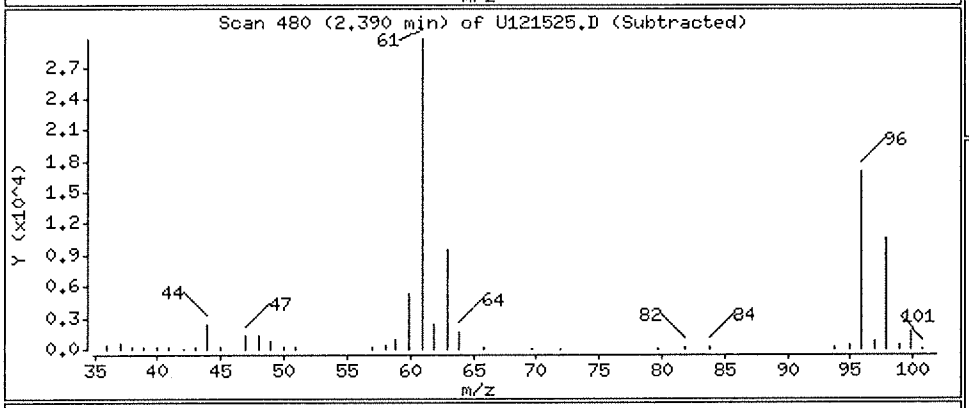
Column phase: DB624

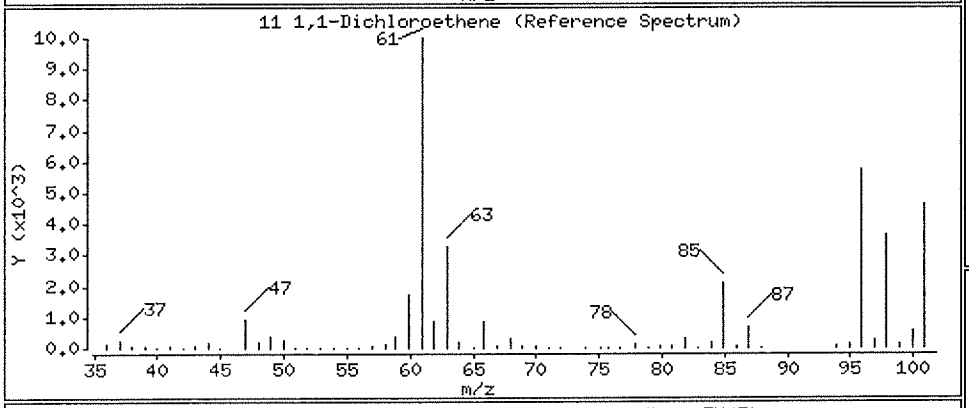
Column diameter: 0.18

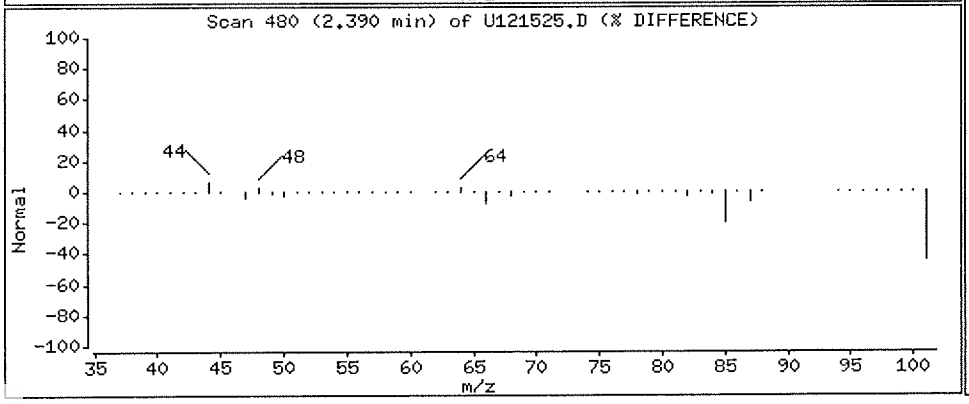
11 1,1-Dichloroethene

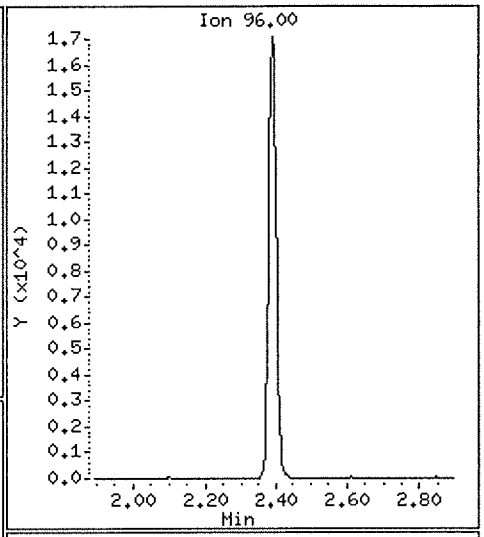
Concentration: 12.00 ug/l

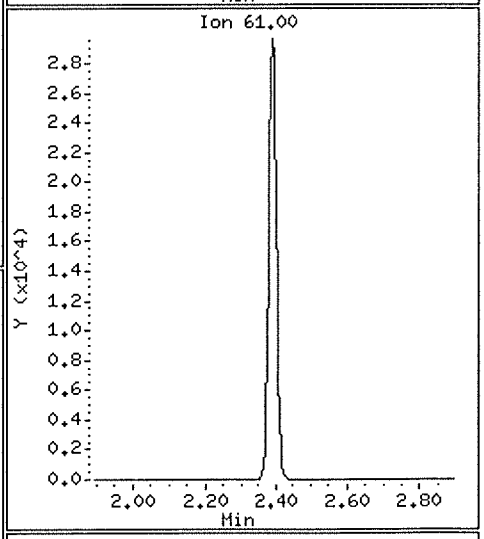


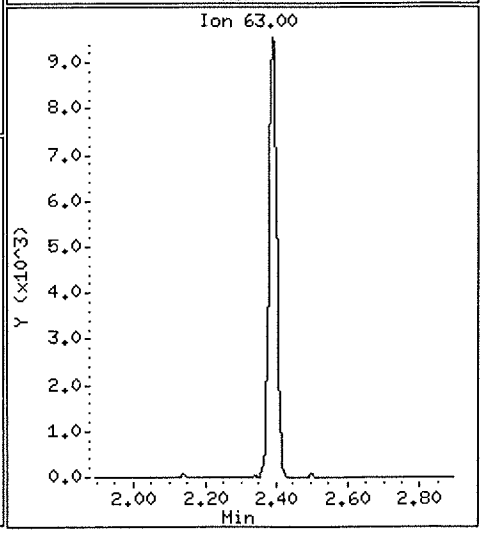












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121525.D Page 5

Date : 15-DEC-2021 21:02

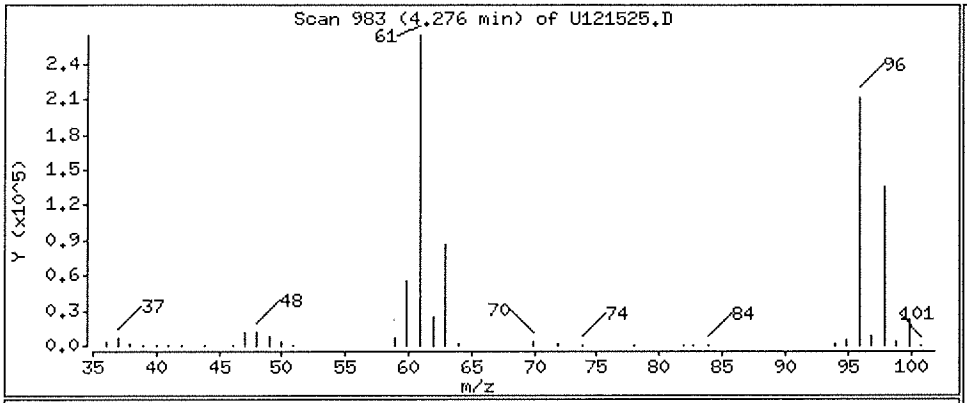
Client ID: HS21120243-05 Instrument: VOA9.i

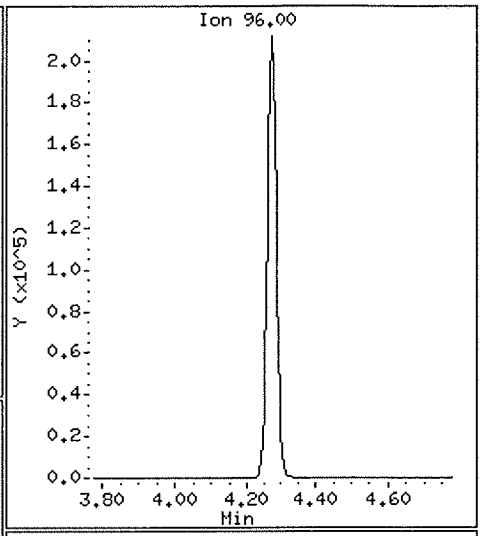
Sample Info: HS21120243-05;HS21120243-05;;;

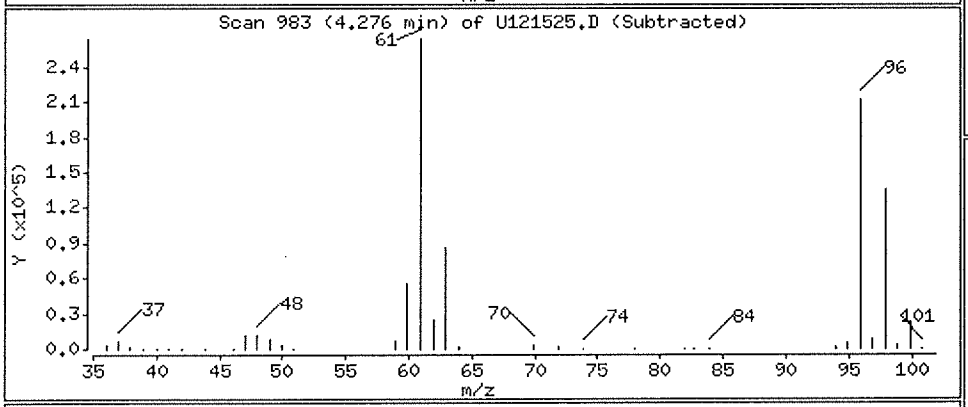
Purge Volume: 5.0 Operator: PC

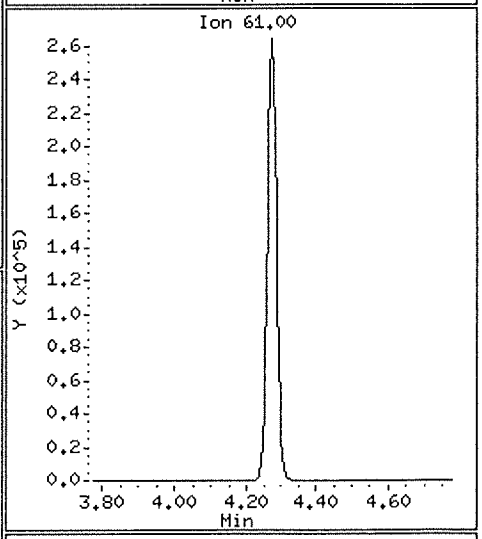
Column phase: DB624 Column diameter: 0.18

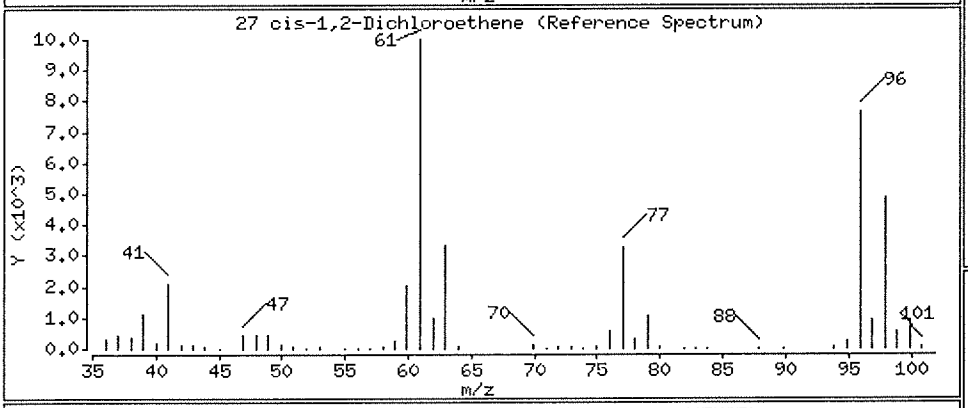
27 cis-1,2-Dichloroethene Concentration: 132.60 ug/l

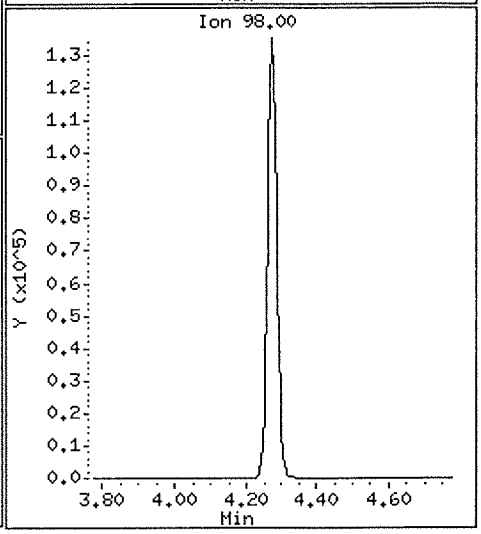


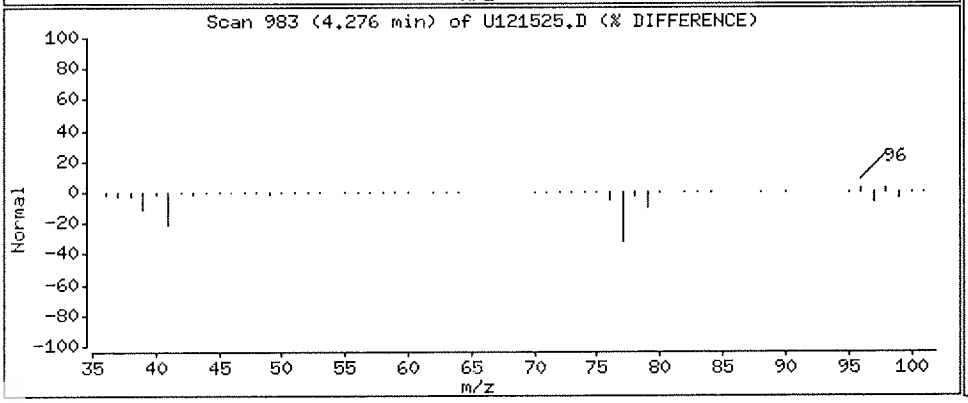












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121525.D

Date : 15-DEC-2021 21:02

Client ID: HS21120243-05

Instrument: VOA9.i

Sample Info: HS21120243-05;HS21120243-05;;;

Purge Volume: 5.0

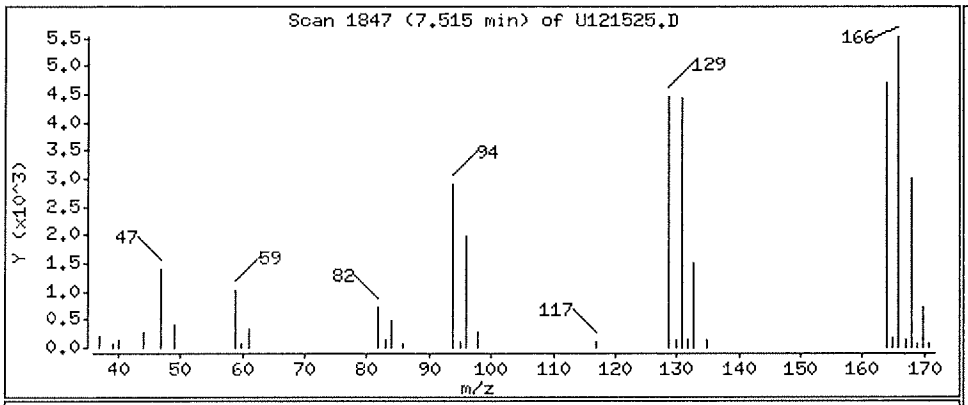
Operator: PC

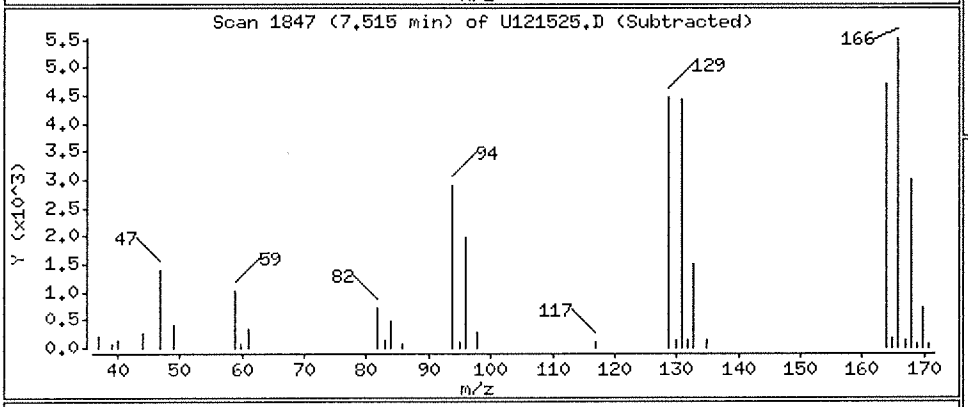
Column phase: DB624

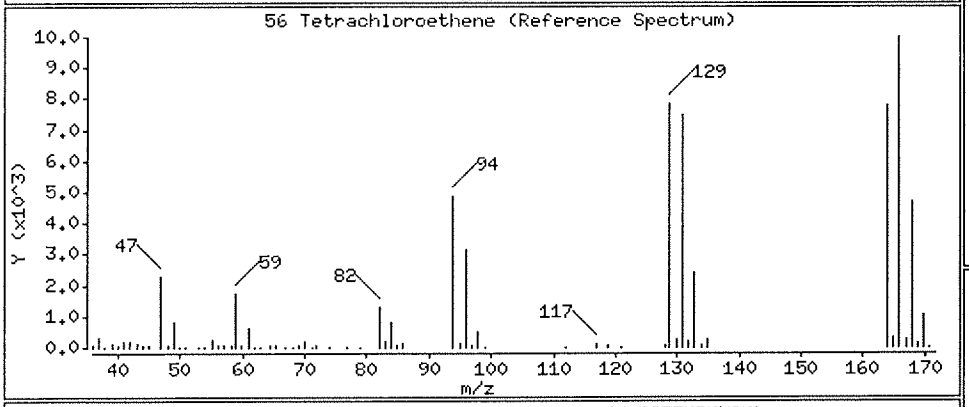
Column diameter: 0.18

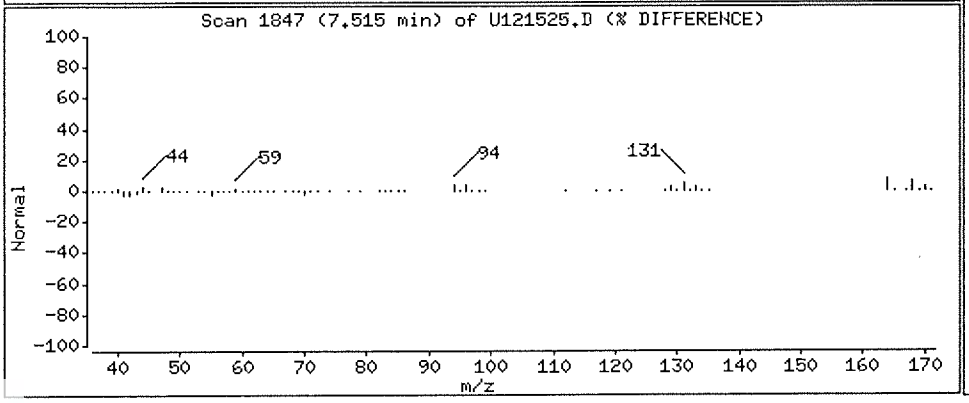
56 Tetrachloroethene

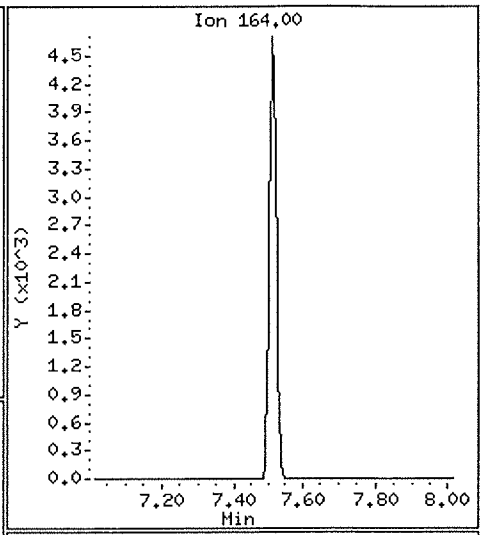
Concentration: 3.17 ug/l

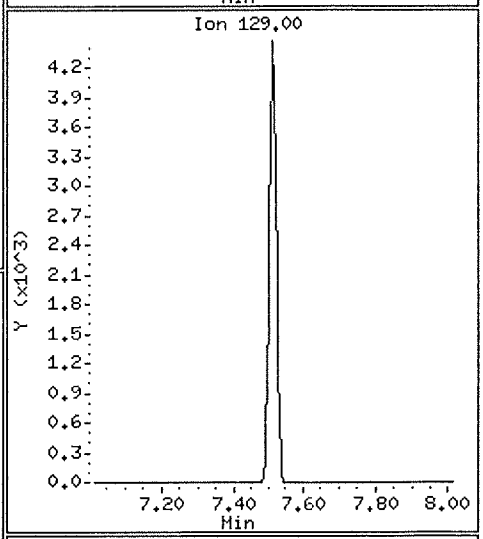


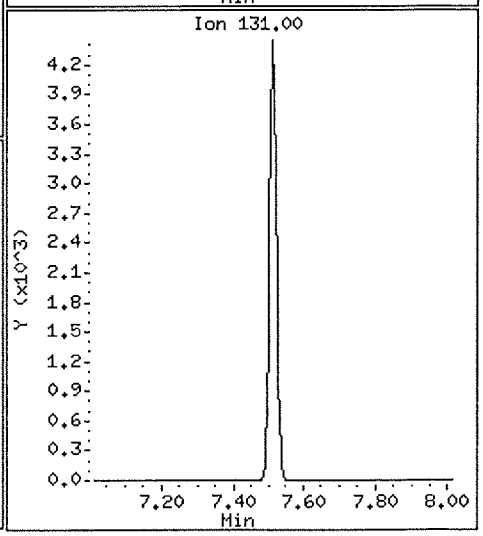












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121525.D Page 7

Date : 15-DEC-2021 21:02

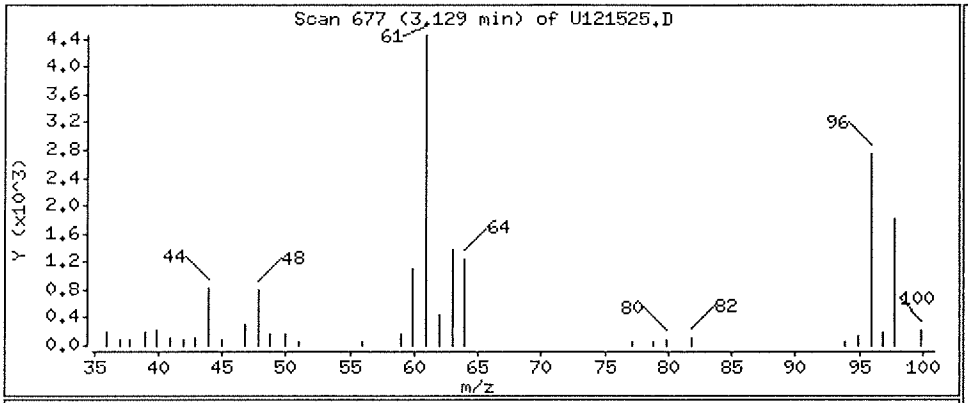
Client ID: HS21120243-05 Instrument: VOA9.i

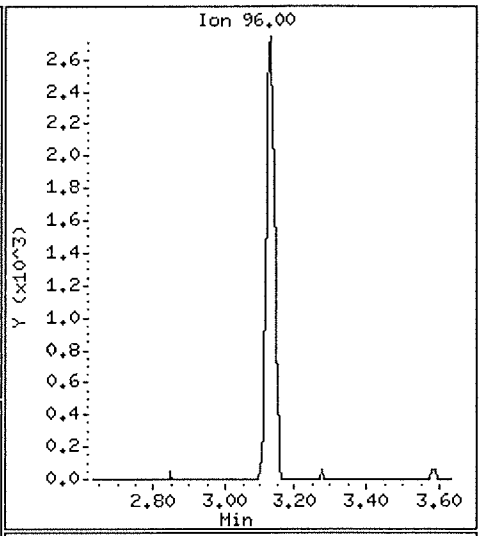
Sample Info: HS21120243-05;HS21120243-05;;;

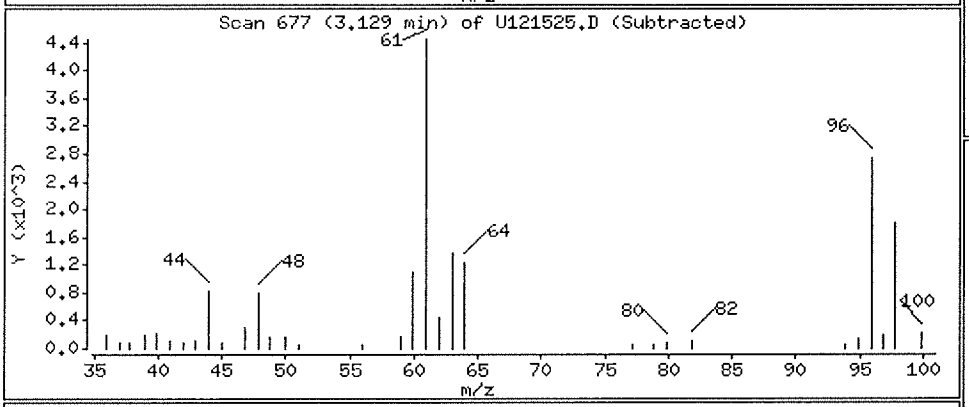
Purge Volume: 5.0 Operator: PC

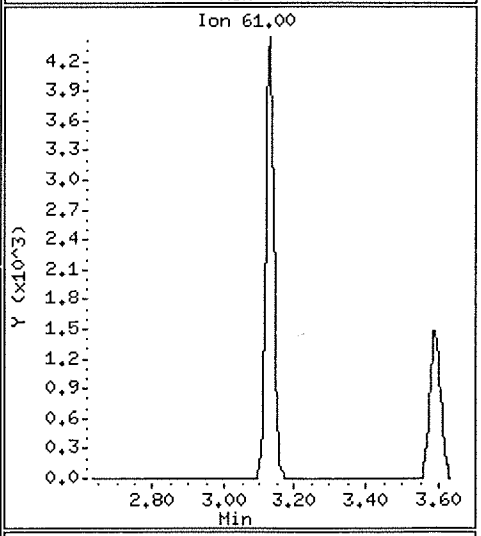
Column phase: DB624 Column diameter: 0.18

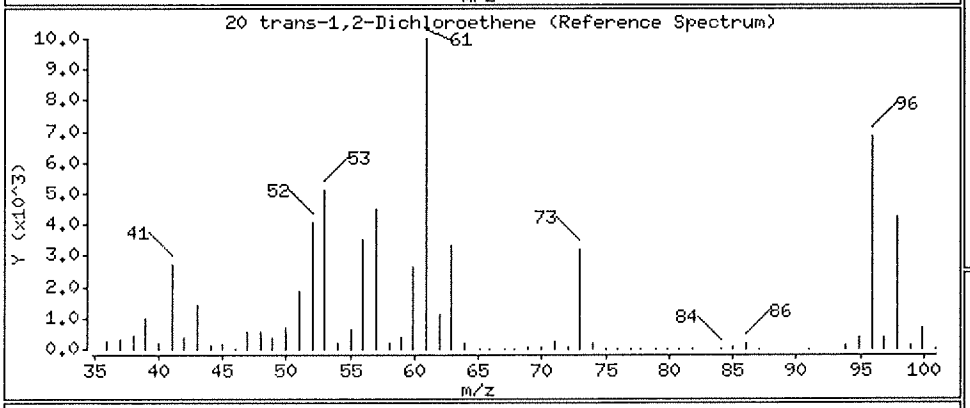
20 trans-1,2-Dichloroethene Concentration: 1.90 ug/l

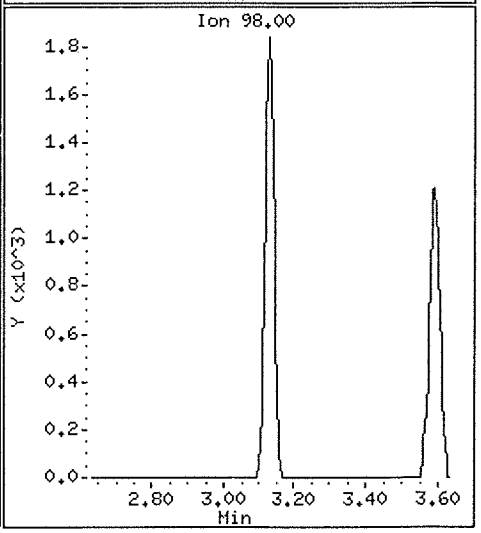


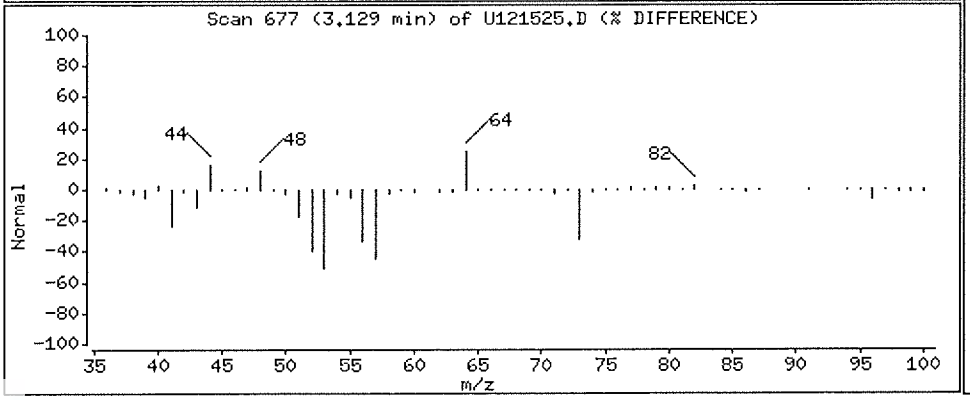












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121525.D

Date : 15-DEC-2021 21:02

Client ID: HS21120243-05

Instrument: VOA9.i

Sample Info: HS21120243-05;HS21120243-05;;;

Purge Volume: 5.0

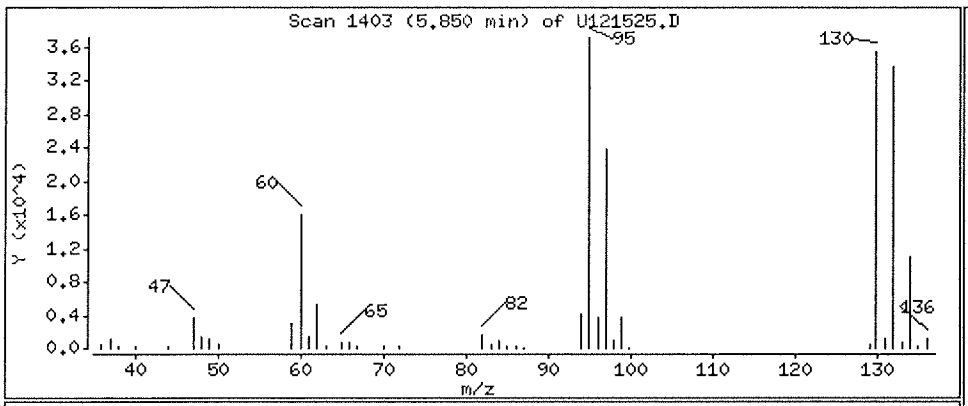
Operator: PC

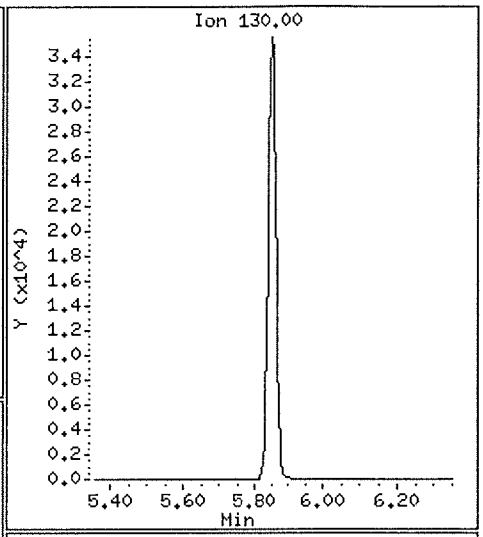
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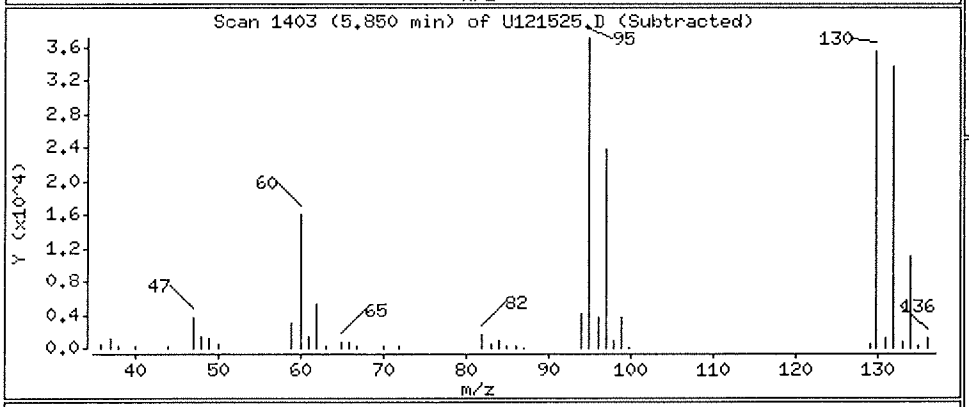
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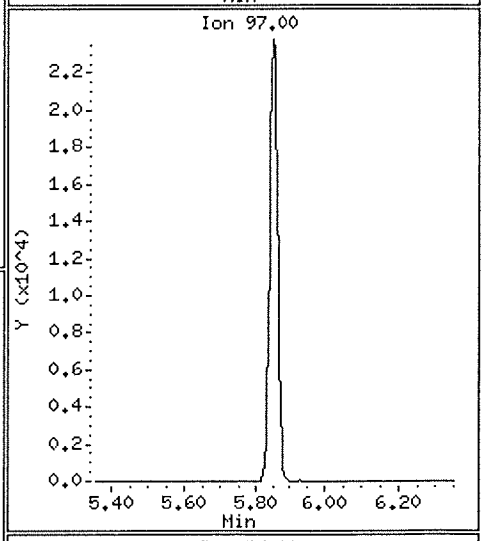
38 Trichloroethene

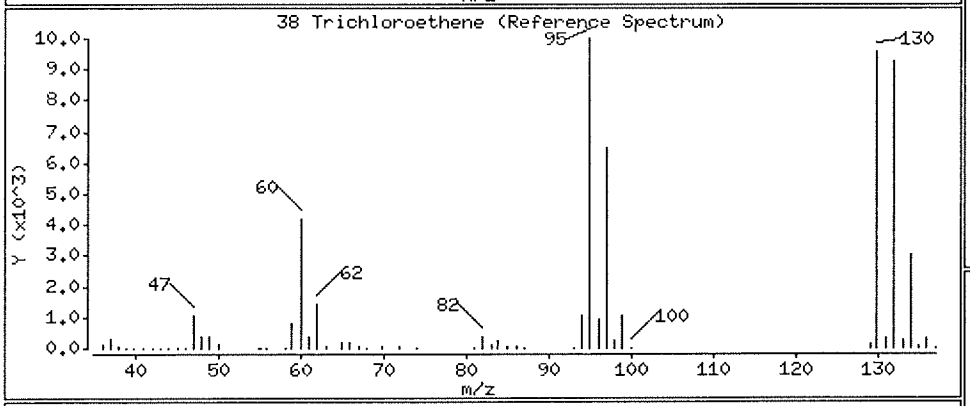
Concentration: 20.29 ug/l

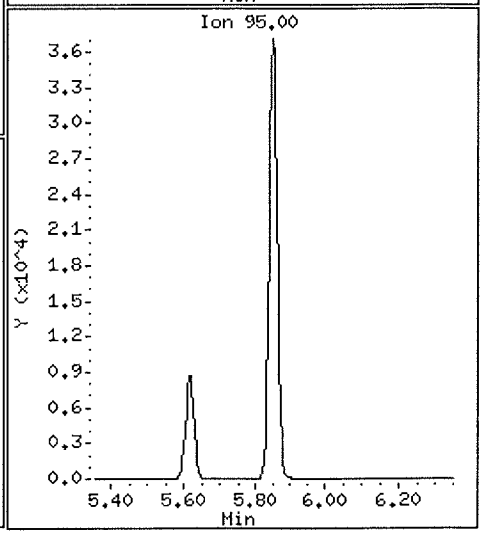


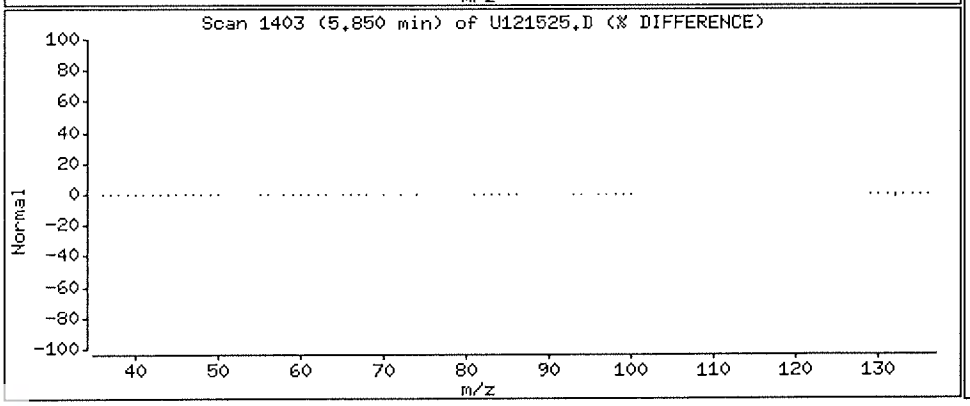












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121525.D

Date : 15-DEC-2021 21:02

Client ID: HS21120243-05

Instrument: VOA9.i

Sample Info: HS21120243-05;HS21120243-05;;;

Purge Volume: 5.0

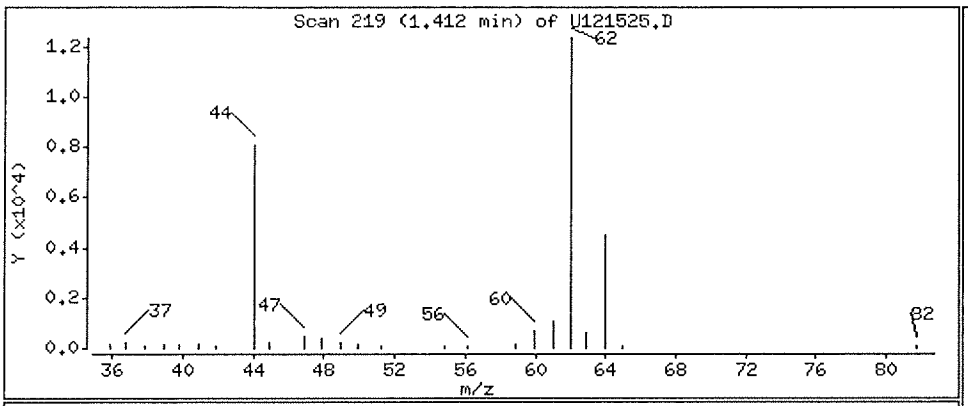
Operator: PC

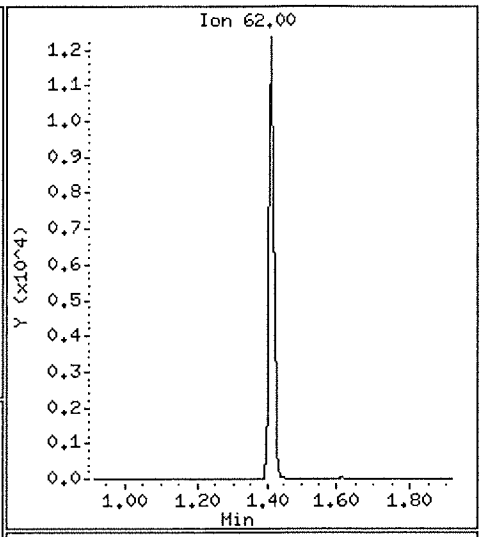
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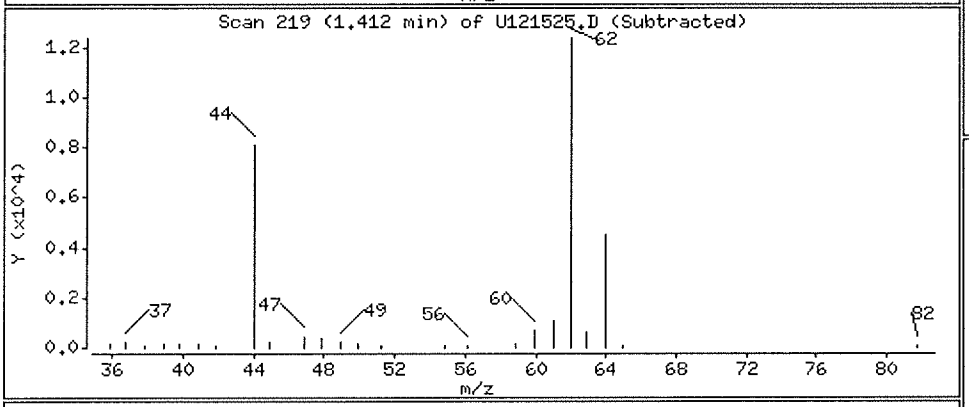
Column diameter: 0.18

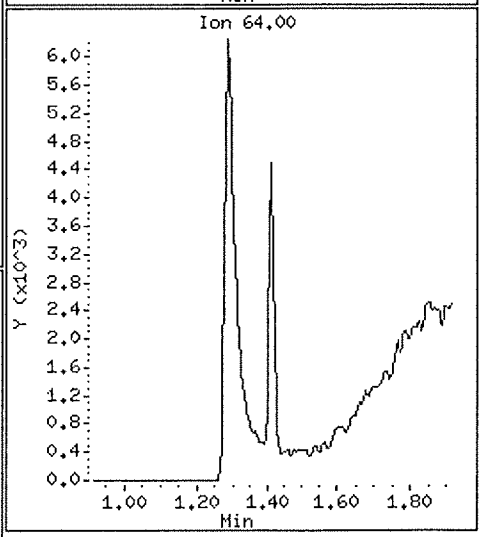
5 Vinyl Chloride

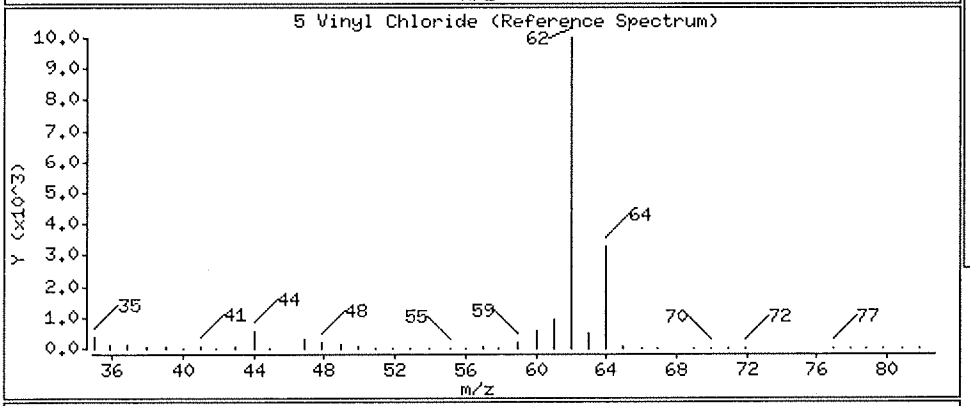
Concentration: 4.26 ug/l

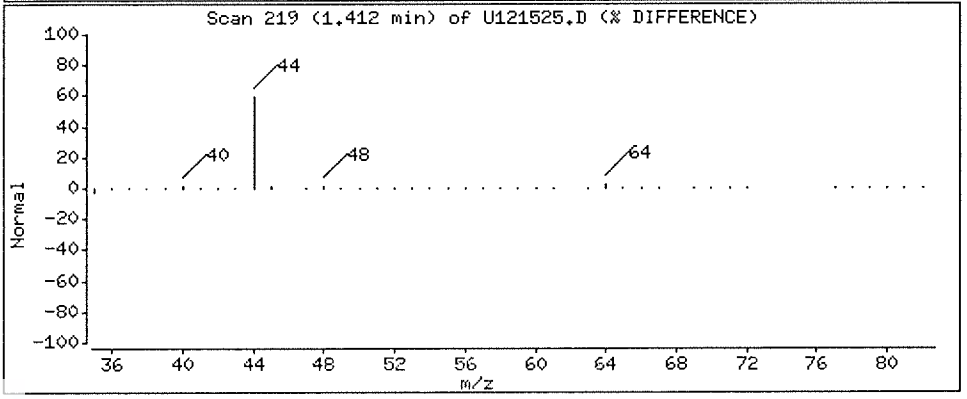












ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121532.D
Lab Smp Id: CCV-END Client Smp ID: CCV-END
Inj Date : 15-DEC-2021 23:39
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD050-END;VSTD050-END;2;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211215.b\8260C.m
Meth Date : 20-Dec-2021 14:53 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 30 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

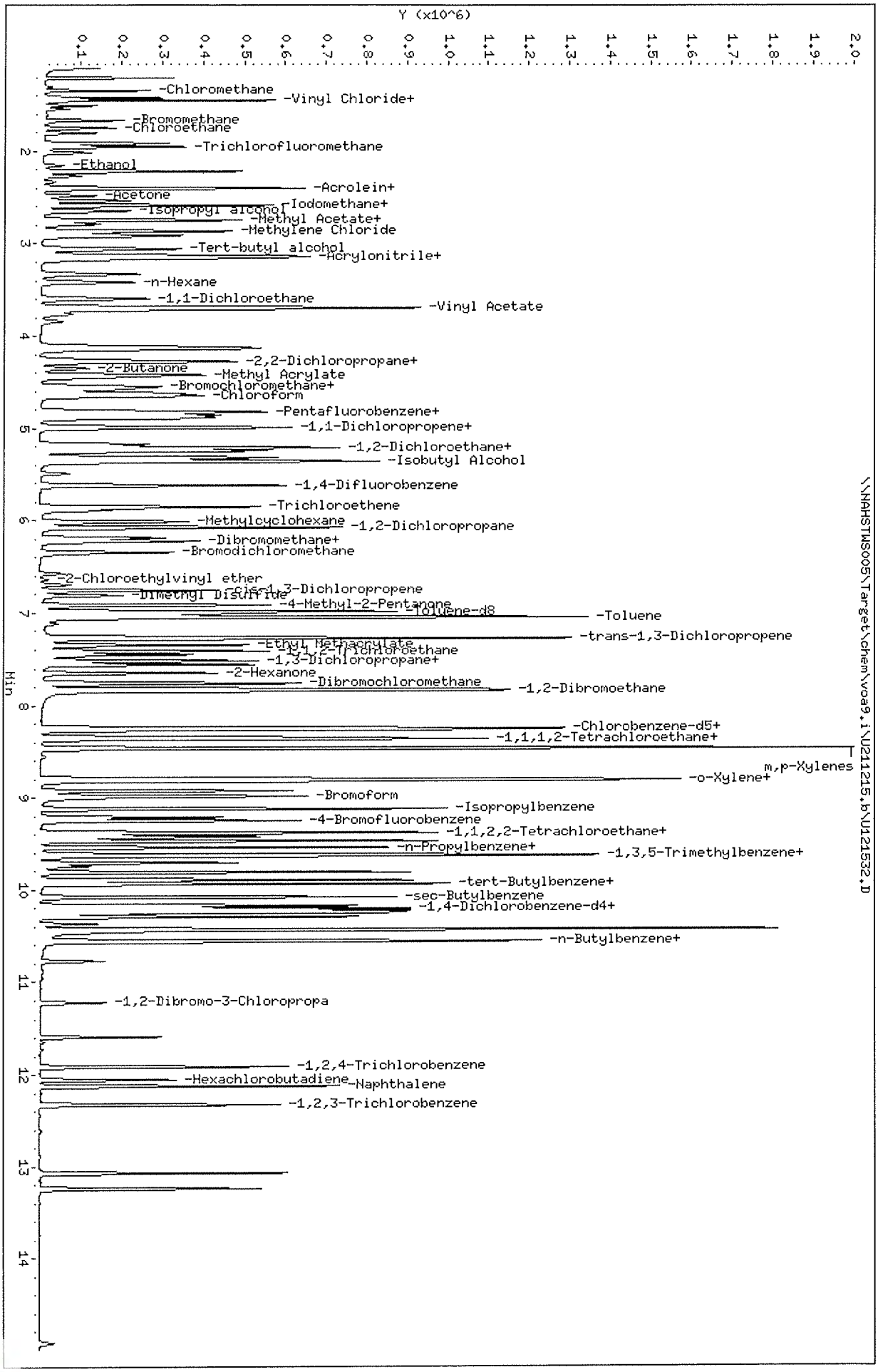
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.887	4.887	(1.000)	225163	50.0000	
*	36 1,4-Difluorobenzene	114	5.618	5.618	(1.000)	422544	50.0000	
*	47 Chlorobenzene-d5	117	8.242	8.242	(1.000)	382768	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	183647	50.0000	
$	30 Dibromofluoromethane	113	4.823	4.823	(0.987)	135774	50.0000	57.57
$	35 1,2-Dichloroethane-d4	65	5.168	5.168	(1.058)	169248	50.0000	61.60
$	48 Toluene-d8	98	6.978	6.978	(0.847)	509611	50.0000	51.15
$	69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	193189	50.0000	52.01
	60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	134536	50.0000	50.68
	31 1,1,1-Trichloroethane	97	4.815	4.815	(0.985)	206300	50.0000	63.64
	68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	214339	50.0000	55.45
	53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	129803	50.0000	57.55
	22 1,1-Dichloroethane	63	3.593	3.593	(0.735)	263144	50.0000	65.78
	11 1,1-Dichloroethene	96	2.397	2.397	(0.491)	122150	50.0000	60.84
	32 1,1-Dichloropropene	75	4.992	4.992	(0.889)	196114	50.0000	56.51
	93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	156917	50.0000	47.71
	71 1,2,3-Trichloropropane	75	9.415	9.415	(0.921)	219070	50.0000	57.72
	90 1,2,4-Trichlorobenzene	180	11.912	11.912	(1.165)	158120	50.0000	46.77
	79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	502541	50.0000	54.58
	89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	27523	50.0000	43.38
	57 1,2-Dibromoethane	107	7.841	7.841	(0.951)	156268	50.0000	57.03
	88 1,2-Dichlorobenzene	146	10.558	10.558	(1.033)	271082	50.0000	52.34

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121532.D Page 2
Report Date: 20-Dec-2021 14:53

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.246	(0.934)	221719	50.0000	58.16
42	1,2-Dichloropropane	63	6.075	6.075	(1.081)	160970	50.0000	60.54
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	487905	50.0000	54.03
83	1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	268320	50.0000	50.72
54	1,3-Dichloropropane	76	7.556	7.556	(0.917)	279869	50.0000	58.23
84	1,4-Dichlorobenzene	146	10.243	10.243	(1.002)	281267	50.0000	51.67
26	2,2-Dichloropropane	77	4.264	4.264	(0.873)	96516	50.0000	42.57
24	2-Butanone	43	4.350	4.350	(0.890)	140441	100.000	119.28
76	2-Chlorotoluene	91	9.539	9.539	(0.933)	440585	50.0000	55.71
52	2-Hexanone	43	7.646	7.646	(0.928)	224752	100.000	123.69
77	4-Chlorotoluene	91	9.629	9.629	(0.942)	516747	50.0000	56.38
82	p-Isopropyltoluene	119	10.198	10.198	(0.997)	461685	50.0000	51.58
45	4-Methyl-2-Pentanone	43	6.911	6.911	(0.839)	309339	100.000	112.21
10	Acetone	43	2.480	2.480	(0.508)	126013	100.000	164.38
37	Benzene	78	5.209	5.209	(0.927)	620217	50.0000	58.04
74	Bromobenzene	156	9.374	9.374	(0.917)	152955	50.0000	53.70
29	Bromochloromethane	128	4.545	4.545	(0.930)	77839	50.0000	61.28
39	Bromodichloromethane	83	6.341	6.341	(1.129)	183109	50.0000	53.18
66	Bromoform	173	8.973	8.973	(1.089)	78569	50.0000	43.91
6	Bromomethane	94	1.663	1.663	(0.340)	92348	50.0000	66.73
19	Carbon Disulfide	76	2.585	2.585	(0.529)	669166	100.000	120.10
34	Carbon Tetrachloride	117	4.984	4.984	(0.887)	168433	50.0000	50.14
59	Chlorobenzene	112	8.264	8.264	(1.003)	394518	50.0000	52.86
7	Chloroethane	64	1.749	1.749	(0.358)	118129	50.0000	63.40(M)
28	Chloroform	83	4.650	4.650	(0.952)	281502	50.0000	64.90
3	Chloromethane	50	1.340	1.340	(0.274)	161293	50.0000	72.15
27	cis-1,2-Dichloroethene	96	4.279	4.279	(0.876)	169000	50.0000	61.43
46	cis-1,3-Dichloropropene	75	6.750	6.750	(1.202)	222543	50.0000	49.96
55	Dibromochloromethane	129	7.751	7.751	(0.940)	140689	50.0000	48.83
44	Dibromomethane	93	6.184	6.184	(1.101)	102684	50.0000	56.62
2	Dichlorodifluoromethane	85	1.202	1.202	(0.246)	178990	50.0000	66.83
61	Ethylbenzene	106	8.362	8.362	(1.015)	197671	50.0000	52.92
91	Hexachlorobutadiene	225	12.054	12.054	(1.179)	56089	50.0000	44.89
67	Isopropylbenzene	105	9.115	9.115	(1.106)	586110	50.0000	52.12
62	m,p-Xylenes	106	8.463	8.463	(1.027)	493003	100.000	106.84
17	Methylene Chloride	84	2.866	2.866	(0.587)	156408	50.0000	58.94
87	n-Butylbenzene	91	10.547	10.547	(1.032)	414618	50.0000	51.66
73	n-Propylbenzene	91	9.467	9.467	(0.926)	696907	50.0000	55.87
92	Naphthalene	128	12.122	12.122	(1.186)	502215	50.0000	49.63
63	o-Xylene	106	8.800	8.800	(1.068)	245059	50.0000	53.61
81	sec-Butylbenzene	105	10.075	10.075	(0.985)	541365	50.0000	52.82
64	Styrene	104	8.815	8.815	(1.070)	445223	50.0000	56.73
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	397897	50.0000	52.27
56	Tetrachloroethene	164	7.514	7.514	(0.912)	101642	50.0000	47.08
50	Toluene	91	7.038	7.038	(0.854)	633867	50.0000	55.35
20	trans-1,2-Dichloroethene	96	3.132	3.132	(0.641)	134517	50.0000	59.40
51	trans-1,3-Dichloropropene	75	7.256	7.256	(1.292)	184523	50.0000	48.40
38	Trichloroethene	130	5.854	5.854	(1.042)	158557	50.0000	57.43
8	Trichlorofluoromethane	101	1.951	1.951	(0.399)	234374	50.0000	64.54
5	Vinyl Chloride	62	1.419	1.419	(0.290)	181593	50.0000	66.68

QC Flag Legend

M - Compound response manually integrated.

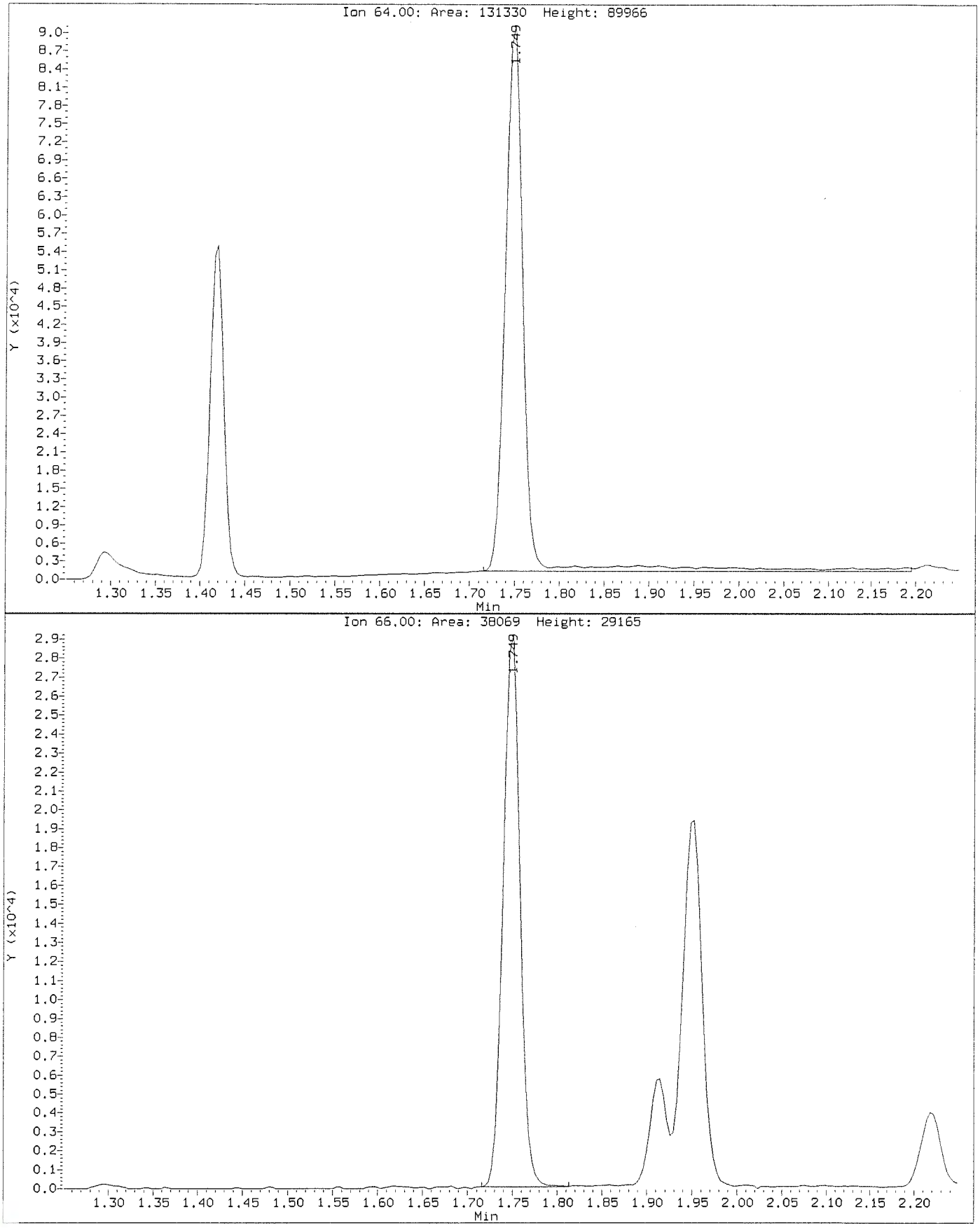


Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121532.D
Date : 15-DEC-2021 23:39
Client ID: CCV-END
Sample Info: VSTD050-END;VSTD050-END;2;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

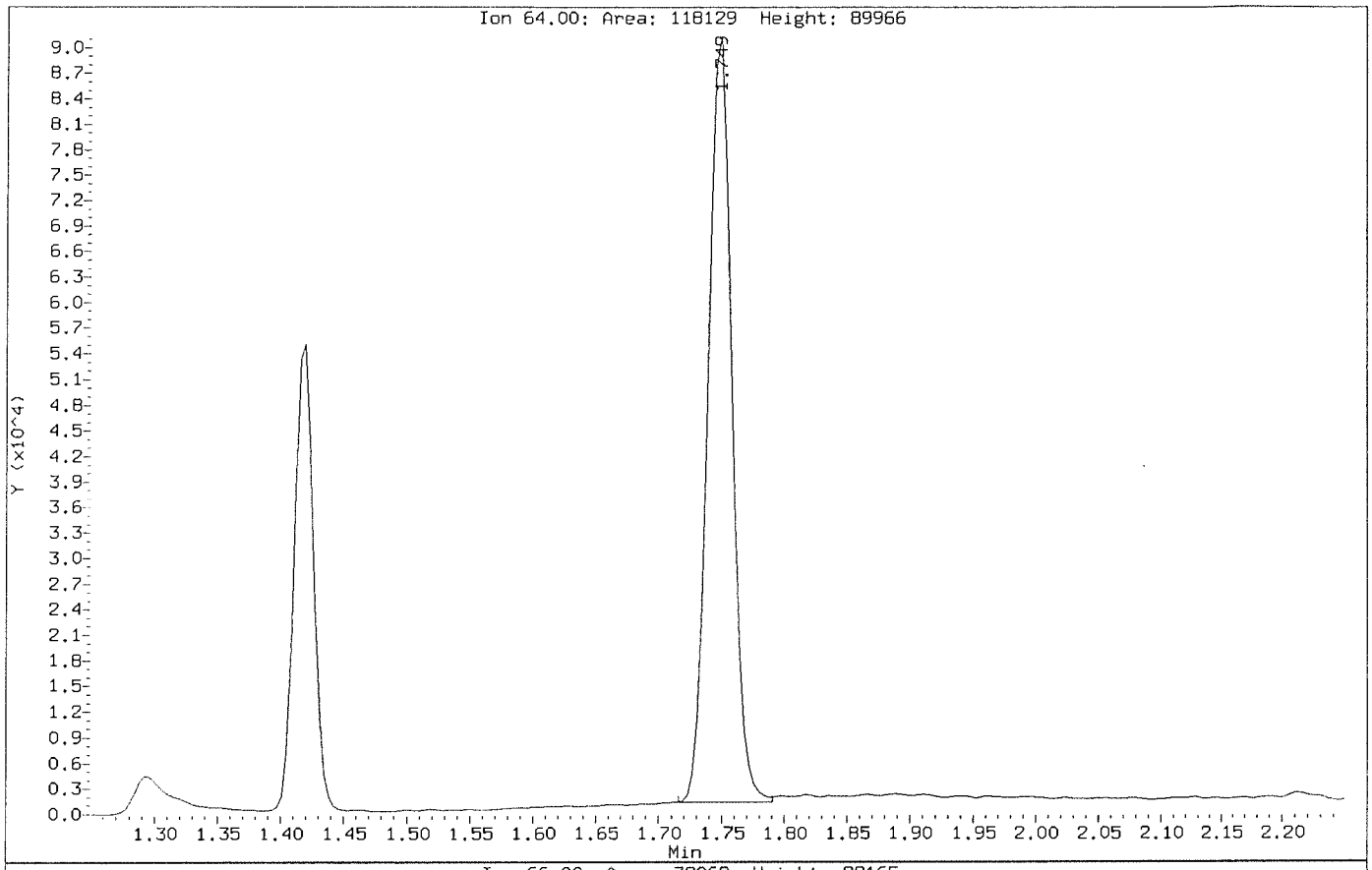
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Injection Date: 15-DEC-2021 23:39
Instrument: VOA9.i
Client Sample ID: CCV-END

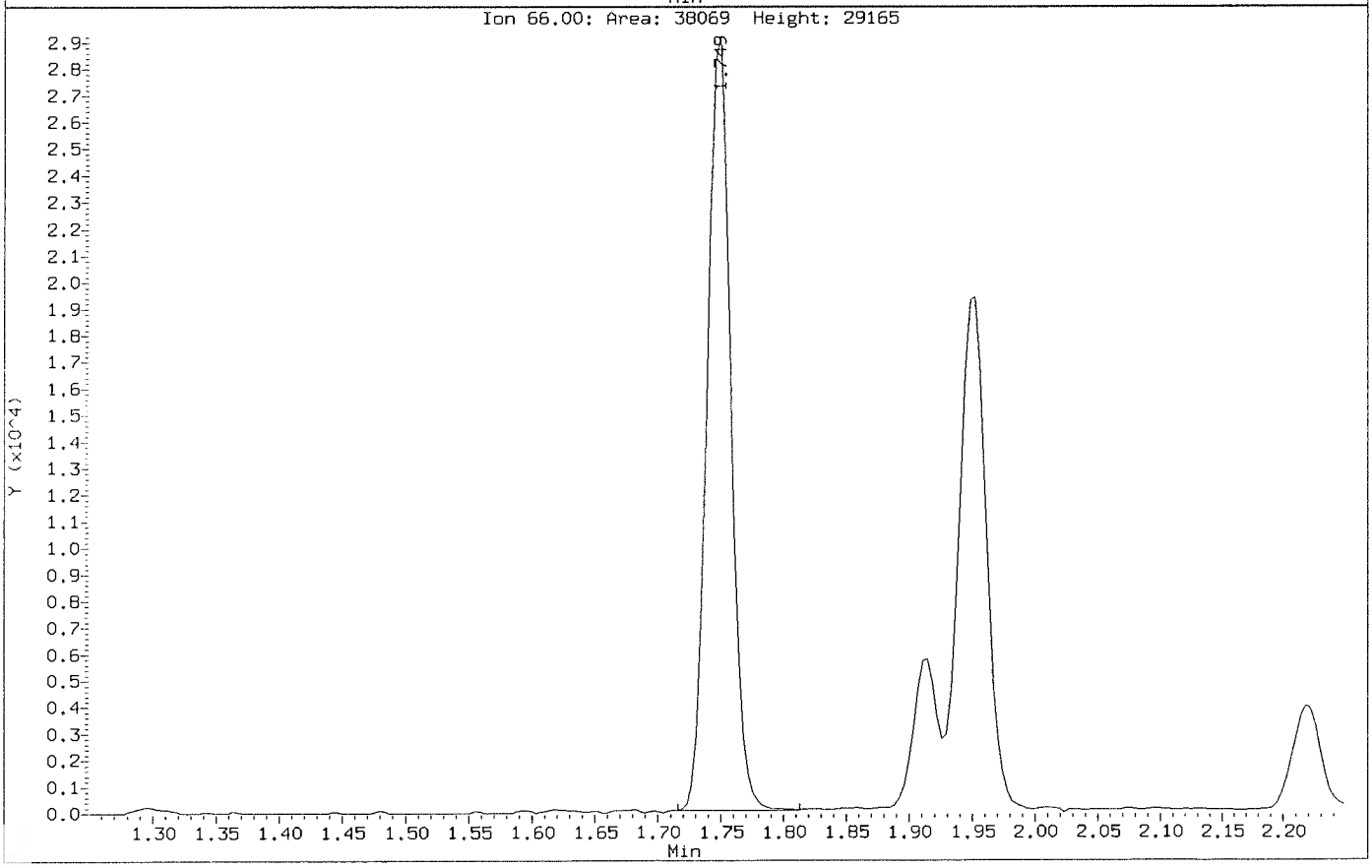
Compound: Chloroethane
CAS Number: 75-00-3



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211215.b\U121532.D
Injection Date: 15-DEC-2021 23:39
Instrument: VOA9.i
Client Sample ID: CCV-END

Compound: Chloroethane
CAS Number: 75-00-3





HS21120243 - ME - ICP_W_DOD

ALS WO# HS21120243

ALS Houston, US

Date: 11-Jan-22

Form 11 - INTERNAL STANDARD ASSOCIATION

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243

Instrument:ICPMS06

Mass	Analyte	Assoc Int Standard 1	Assoc Int Standard 2	Mode
9	Beryllium	Lithium		Ar
11	Boron	Lithium		Ar
23	Sodium	Germanium		ArHe
24	Magnesium	Germanium		ArHe
27	Aluminum	Germanium		ArHe
39	Potassium	Germanium		ArHe
44	Calcium	Germanium		Ar
47	Titanium	Germanium		Ar
51	Vanadium	Germanium		ArHe
52	Chromium	Germanium		ArHe
55	Manganese	Germanium		ArHe
56	Iron	Germanium		ArHe
59	Cobalt	Germanium		ArHe
60	Nickel	Germanium		ArHe
63	Copper	Germanium		ArHe
66	Zinc	Germanium		ArHe
75	Arsenic	Germanium		ArHe
82	Selenium	Germanium		Ar
88	Strontium	Indium		Ar
95	Molybdenum	Indium		Ar
105	Palladium	Germanium		Ar
107	Silver	Indium		Ar
114	Cadmium	Indium		Ar
118	Tin	Indium		Ar
121	Antimony	Germanium		ArHe
137	Barium	Indium		Ar
205	Thallium	Bismuth		Ar
208	Lead	Bismuth		Ar

ALS Houston, US

Date: 11-Jan-22

FORM 12 - PREPARATION LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243
Start Date: 15-Dec-2021 09:30 End Date: 15-Dec-2021 13:30

Batch ID: 173565
Prep Code: 3010A
Method: SW3010A
Technician:

SampID	ClientID	Matrix	Init Wt	Init Vol	FinalVol (mL)	PrepFac
HS21120092-05MS				10	10	1
HS21120092-05MSD				10	10	1
HS21120092-05PDS				10	10	1
HS21120092-05SD				10	10	1
HS21120243-04	LHSMW06_120221	Groundwater		10	10	1
HS21120243-05	LHSMW06_120221_a	Groundwater		10	10	1
LCS-173565				10	10	1
MBLK-173565				10	10	1

ALS Houston, US Date: 11-Jan-22

FORM 13 - ANALYSIS RUN LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243
Start Date: 15-Dec-2021 End Date: 16-Dec-2021

Run ID:ICPMS06_397733
Instrument:ICPMS06
Method:

Sample No.	D/F	Time	FileID	Analytes
ICPMS06_397733_Tune	1	15-Dec-2021 00:00	ICPMS06_397733_Tune_1	
CAL BLK	1	15-Dec-2021 11:06	008CALB.d_6423983	AS
2/10/200	1	15-Dec-2021 11:08	009CALS.d_6423984	AS
5/25/500	1	15-Dec-2021 11:10	010CALS.d_6423985	AS
10/50/100	1	15-Dec-2021 11:12	011CALS.d_6423986	AS
100/500/10K	1	15-Dec-2021 11:14	012CALS.d_6423987	AS
200/1000/20K	1	15-Dec-2021 11:16	013CALS.d_6423988	AS
ICV	1	15-Dec-2021 11:20	015_ICV.d_6423990	AS
LLICV2	1	15-Dec-2021 11:22	016LCV2.d_6423991	AS
LLICV5	1	15-Dec-2021 11:24	017LCV5.d_6423992	AS
ICB	1	15-Dec-2021 11:26	018_ICB.d_6423993	AS
ICSA	1	15-Dec-2021 11:38	020ICSA.d_6423995	AS
ICSAB	1	15-Dec-2021 11:40	021ICSB.d_6423996	AS
CAL BLK	1	15-Dec-2021 19:51	155CALB.d_6424018	AS
2/10/200	1	15-Dec-2021 19:53	156CALS.d_6424019	AS
5/25/500	1	15-Dec-2021 19:55	157CALS.d_6424020	AS
10/50/100	1	15-Dec-2021 19:57	158CALS.d_6424021	AS
100/500/10K	1	15-Dec-2021 19:59	159CALS.d_6424022	AS
200/1000/20K	1	15-Dec-2021 20:01	160CALS.d_6424023	AS
ICV	1	15-Dec-2021 20:04	162_ICV.d_6424025	AS
LLICCV5	1	15-Dec-2021 20:06	163LCV5.d_6424026	AS
LLICCV2	1	15-Dec-2021 20:08	164LCV2.d_6424027	AS
ICCB 1	1	15-Dec-2021 20:10	165_ICB.d_6424028	AS
CCV 1	1	15-Dec-2021 21:21	201_CCV.d_6424039	AS
CCB 2	1	15-Dec-2021 21:23	202_CCB.d_6424040	AS
MBLK-173565	1	15-Dec-2021 21:25	203SMPL.d_6424041	AS
LCS-173565	1	15-Dec-2021 21:27	204SMPL.d_6424042	AS
ZZZZZZSD	5	15-Dec-2021 21:31	206SMPL.d_6424044	AS
ZZZZZZMS	1	15-Dec-2021 21:33	207SMPL.d_6424045	AS
ZZZZZZMSD	1	15-Dec-2021 21:35	208SMPL.d_6424046	AS
ZZZZZZPDS	1	15-Dec-2021 21:37	209SMPL.d_6424047	
CCV 2	1	15-Dec-2021 21:39	210_CCV.d_6424048	AS
CCB 3	1	15-Dec-2021 21:41	211_CCB.d_6424049	AS
CCV 3	1	15-Dec-2021 21:55	218_CCV.d_6424056	AS
CCB 4	1	15-Dec-2021 21:57	219_CCB.d_6424057	AS
LHSMW06_120221	1	15-Dec-2021 22:06	223SMPL.d_6424033	AS
LHSMW06_120221_a	1	15-Dec-2021 22:08	224SMPL.d_6424034	AS
CCV 4	1	15-Dec-2021 22:14	227_CCV.d_6424036	AS
CCB 5	1	15-Dec-2021 22:16	228_CCB.d_6424037	AS
CCV 5	1	16-Dec-2021 00:08	284_CCV.d_6424253	AS
CCB 6	1	16-Dec-2021 00:09	285_CCB.d_6424254	AS
LLCCV2	1	16-Dec-2021 00:11	286LCV2.d_6424255	AS
LLCCV5	1	16-Dec-2021 00:13	287LCV5.d_6424256	AS
ICSA	1	16-Dec-2021 00:15	288ICSA.d_6424257	AS
ICSAB	1	16-Dec-2021 00:17	289ICSB.d_6424258	AS

ALS Houston, US Date: 11-Jan-22

Form 2 - Initial and Continuing Calibration Verification

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243

Run ID: ICPMS06_397733
Instrument: ICPMS06
Method: SW6020A

ICV	Date: 15-Dec-2021 11:20		Seq: 6423990	ICV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	105.047	105	90-110	

ICV	Date: 15-Dec-2021 20:04		Seq: 6424025	ICV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	104.062	104	90-110	

CCV1	Date: 15-Dec-2021 21:21		Seq: 6424039	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	100.043	100	90-110	

CCV2	Date: 15-Dec-2021 21:39		Seq: 6424048	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	99.361	99	90-110	

CCV3	Date: 15-Dec-2021 21:55		Seq: 6424056	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	99.717	100	90-110	

CCV4	Date: 15-Dec-2021 22:14		Seq: 6424036	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	99.839	100	90-110	

CCV5	Date: 16-Dec-2021 00:08		Seq: 6424253	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	99.288	99	90-110	

Form 3 - BLANKS

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243

Run ID: ICPMS06_397733
Instrument: ICPMS06
Method: SW6020A

ICB	Date: 15-Dec-2021 11:26		Seq: 6423993	ICB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	5	0.4	5	U	

ICCB1	Date: 15-Dec-2021 20:10		Seq: 6424028	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	5	0.4	5	U	

CCB2	Date: 15-Dec-2021 21:23		Seq: 6424040	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	

MBLK-173565	Date: 15-Dec-2021 21:25		Seq: 6424041	MBLK	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	5	0.4	5	U	

CCB3	Date: 15-Dec-2021 21:41		Seq: 6424049	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	

CCB4	Date: 15-Dec-2021 21:57		Seq: 6424057	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	

CCB5	Date: 15-Dec-2021 22:16		Seq: 6424037	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	

CCB6	Date: 16-Dec-2021 00:09		Seq: 6424254	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	

ALS Houston, US Date: 11-Jan-22

Form 4 - ICP Interference Check Sample

Client: Bhate Environmental Associates, Inc. Run ID: ICPMS06_397733
Project: LHAAP / Site 58 Instrument: ICPMS06
WorkOrder: HS21120243 Method: SW6020A

ICSA	Date: 15-Dec-2021 11:38	Seq: 6423995	ICSA	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Arsenic		0.094	0	

ICSAB	Date: 15-Dec-2021 11:40	Seq: 6423996	ICSAB	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Arsenic	100	97.12	97.1	

ICSA	Date: 16-Dec-2021 00:15	Seq: 6424257	ICSA	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Arsenic		0.023	0	

ICSAB	Date: 16-Dec-2021 00:17	Seq: 6424258	ICSAB	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Arsenic	100	97.92	97.9	

ALS Houston, US

Date: 11-Jan-22

Form 5A - Matrix Spike/Matrix Spike Duplicate Recovery

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243

Date Analyzed: 15-Dec-2021 21:35
Date Extracted: 15-Dec-2021 13:30
Units: ug/L

Matrix Spike: HS21120092-05MS
Client Sample ID:

Analysis Method: SW6020A

Analyte	Sample Result	MS Result	Spike Amount	% Rec	MSD Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
Arsenic	1.712	56.42	50.00	109	56.88	50.00	110	84-116	0.809	20

ALS Houston, US Date: 11-Jan-22

Form 7 - Laboratory Control Sample

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243

Date Analyzed: 15-Dec-2021 21:27
Date Extracted: 15-Dec-2021 13:30
Units: ug/L

Lab Sample ID: LCS-173565 Analysis Method: SW6020A

Analyte	Spike Amount	LCS Result	% Rec	% Rec Limits
Arsenic	50	53.07	106	84-116

ALS Houston, US Date: 11-Jan-22

Form 8 - ICP Serial Dilutions

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
WorkOrder: HS21120243

Date Analyzed: 15-Dec-2021 21:31
Date Extracted: 15-Dec-2021 13:30
Units: ug/L

Lab Sample ID: HS21120092-05SD
Client Sample ID:

Analysis Method: SW6020A

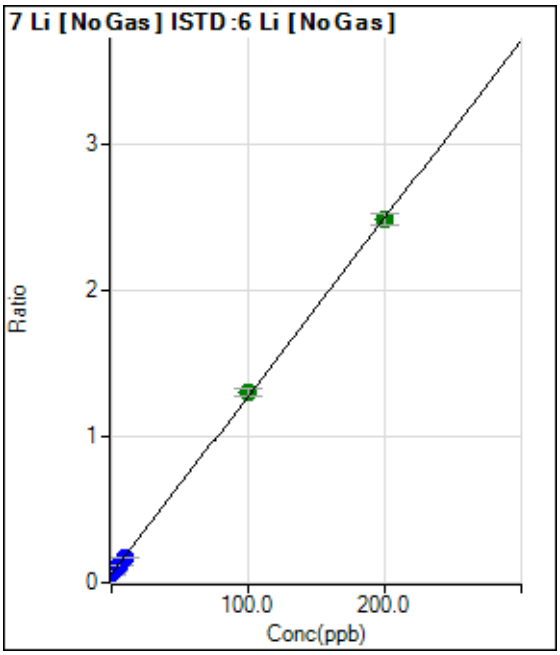
Analyte	Sample Result	C	SD Result	C	RPD	Q
Arsenic	1.712	J	0	U	0	

Calibration for 162_ICV.d

Batch Folder: C:\Agilent\ICPMH\1\DATA\121521A.b\
Analysis File: 121521A.batch.bin
DA Date-Time: 12/15/2021 8:05:33 PM
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

Level	Standard Data File	Sample Name	Acq. Date-Time
1	155CALB.d	CAL BLK	12/15/2021 7:51:17 PM
2	156CALS.d	2/10/200	12/15/2021 7:53:15 PM
3	157CALS.d	5/25/500	12/15/2021 7:55:13 PM
4	158CALS.d	10/50/100	12/15/2021 7:57:11 PM
5	159CALS.d	100/500/10K	12/15/2021 7:59:09 PM
6	160CALS.d	200/1000/20K	12/15/2021 8:01:02 PM

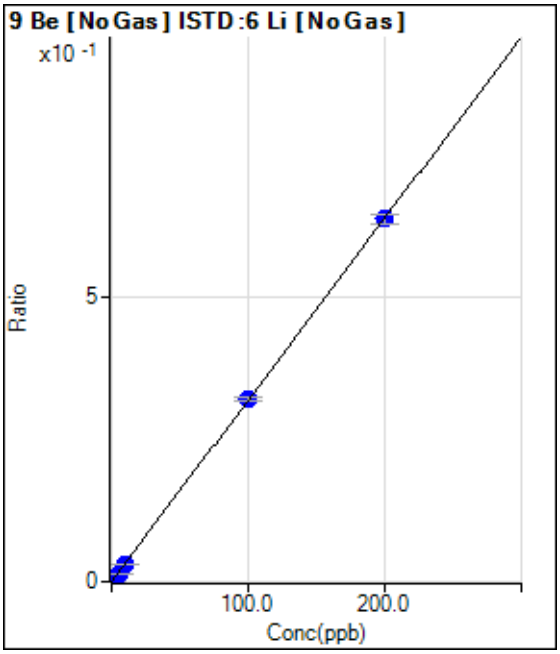
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	50552.12	0.0594	P	0.8
2	☐	2.000	1.899	69634.36	0.0825	P	1.1
3	☐	5.000	4.798	98214.42	0.1178	P	1.7
4	☐	10.000	9.544	146627.60	0.1756	P	1.4
5	☐	100.000	101.940	1024927.49	1.3011	A	4.5
6	☐	200.000	199.059	1916055.96	2.4842	A	3.4

y = 0.0122 * x + 0.0594
R = 0.9999
DL = 0.1106
BEC = 4.874

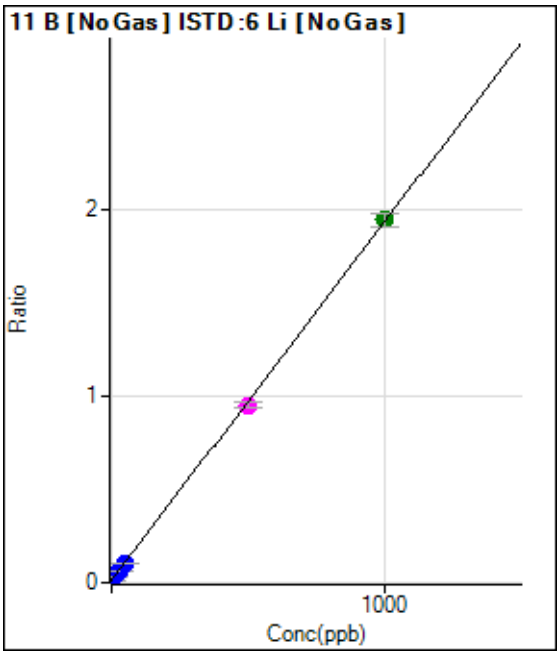
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	11.67	0.0000	P	64.5
2	☐	2.000	1.867	5025.95	0.0060	P	4.4
3	☐	5.000	4.688	12452.24	0.0149	P	2.3
4	☐	10.000	9.303	24736.75	0.0296	P	1.9
5	☐	100.000	100.368	251783.29	0.3196	P	2.4
6	☐	200.000	199.860	490818.99	0.6363	P	3.0

y = 0.0032 * x + 1.3642E-005
R = 1.0000
DL = 0.008288
BEC = 0.004285

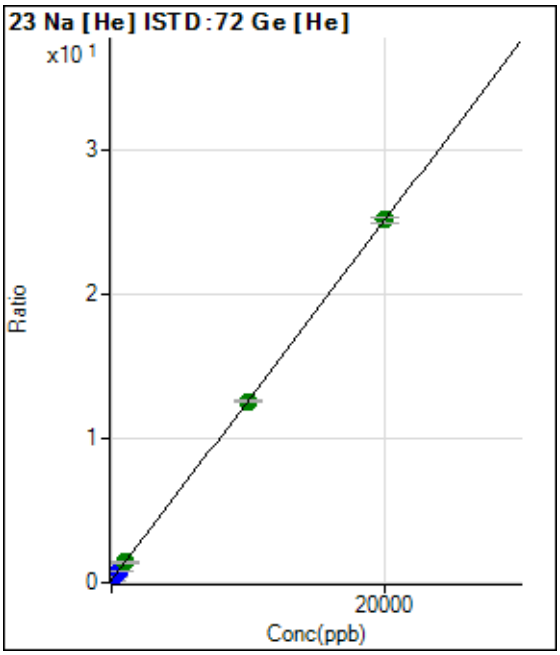
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	10959.36	0.0129	P	1.7
2	☐	10.000	9.165	25700.24	0.0304	P	0.9
3	☐	25.000	23.392	48130.44	0.0577	P	1.2
4	☐	50.000	47.375	86603.19	0.1037	P	0.5
5	☐	500.000	489.236	749403.14	0.9512	M	3.2
6	☐	1000.000	1005.562	1497279.20	1.9414	A	3.9

y = 0.0019 * x + 0.0129
R = 0.9999
DL = 0.3404
BEC = 6.711

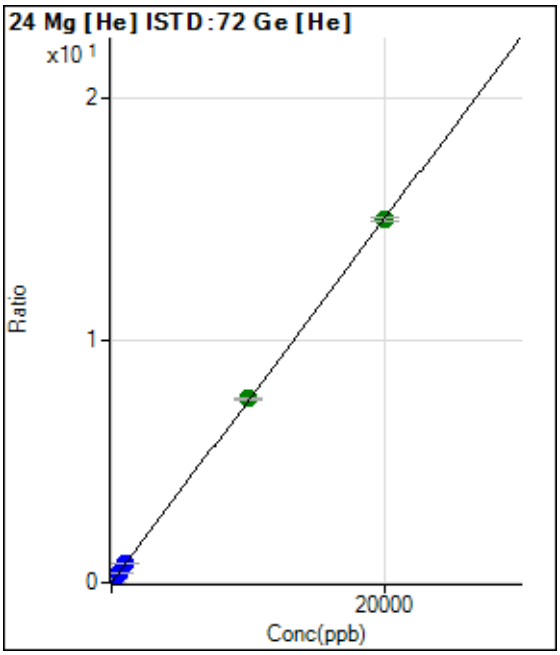
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	113314.05	0.1633	P	0.7
2	☐	200.000	198.289	286337.36	0.4101	P	0.5
3	☐	500.000	501.016	555136.35	0.7870	P	1.0
4	☐	1000.000	1002.597	986188.45	1.4115	A	2.3
5	☐	10000.00	9928.910	8630568.00	12.5249	A	1.3
6	☐	20000.00	20035.40	17034505.17	25.1076	A	1.3

y = 0.0012 * x + 0.1633
R = 1.0000
DL = 2.612
BEC = 131.1

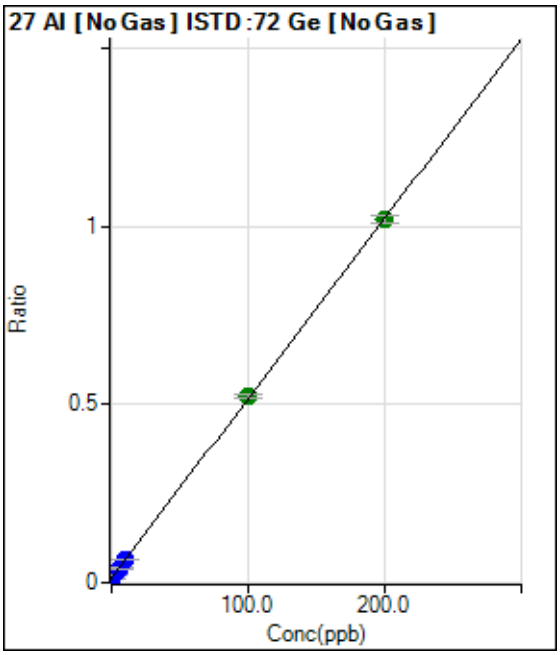
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	443.35	0.0006	P	9.4
2	☐	200.000	206.815	108913.14	0.1560	P	0.4
3	☐	500.000	516.749	274258.94	0.3888	P	0.2
4	☐	1000.000	1046.621	549796.96	0.7869	P	1.3
5	☐	10000.00	10118.72	5238421.49	7.6019	A	1.3
6	☐	20000.00	19937.81	10162238.18	14.9782	A	1.1

y = 7.5121E-004 * x + 6.3888E-004
R = 1.0000
DL = 0.2391
BEC = 0.8505

Weight: <None>
Min Conc: <None>

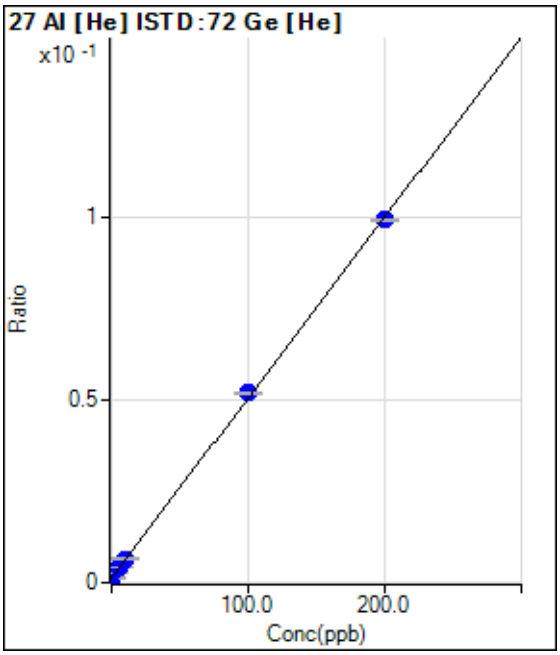


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	27811.48	0.0130	P	0.3
2	☐	2.000	2.098	50608.92	0.0236	P	0.6
3	☐	5.000	5.412	86450.94	0.0403	P	1.3
4	☐	10.000	10.639	141654.95	0.0667	P	0.8
5	☐	100.000	101.232	1095713.63	0.5238	A	1.8
6	☐	200.000	199.340	2115045.70	1.0189	A	2.1

y = 0.0050 * x + 0.0130
R = 1.0000
DL = 0.02521
BEC = 2.576

Weight: <None>
Min Conc: <None>

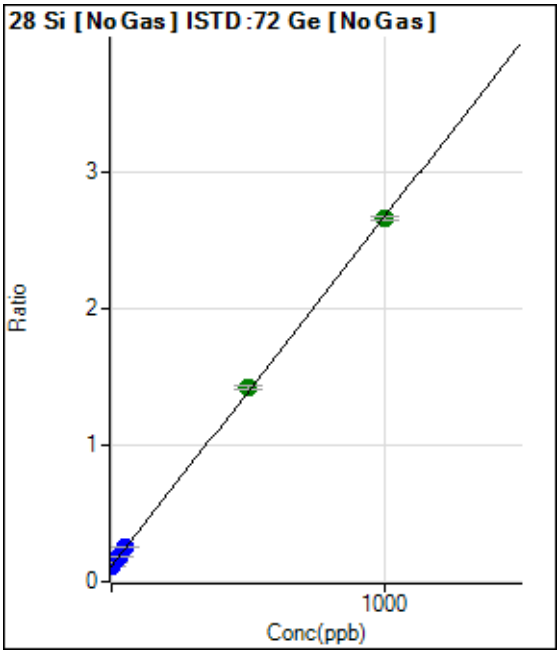
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	910.04	0.0013	P	6.0
2	☐	2.000	4.163	2345.78	0.0034	P	50.4
3	☐	5.000	5.715	2913.70	0.0041	P	8.5
4	☐	10.000	10.539	4547.49	0.0065	P	4.0
5	☐	100.000	102.636	35779.61	0.0519	P	0.8
6	☐	200.000	198.615	67345.96	0.0993	P	0.6

y = 4.9311E-004 * x + 0.0013
R = 0.9999
DL = 0.479
BEC = 2.659

Weight: <None>
Min Conc: <None>

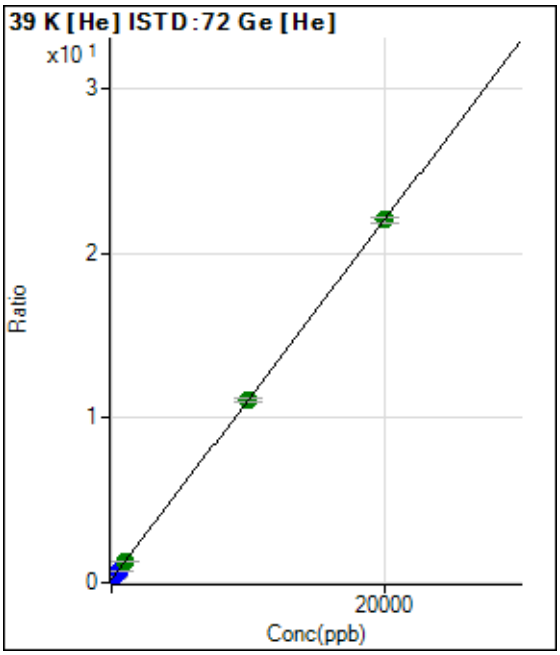


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	244693.35	0.1144	P	0.8
2	☐	10.000	11.161	306587.58	0.1429	P	1.4
3	☐	25.000	25.934	387339.06	0.1806	P	1.0
4	☐	50.000	54.999	541457.00	0.2548	P	2.7
5	☐	500.000	510.462	2966471.94	1.4181	A	1.6
6	☐	1000.000	994.484	5510487.42	2.6543	A	1.0

y = 0.0026 * x + 0.1144
R = 0.9999
DL = 1.031
BEC = 44.78

Weight: <None>
Min Conc: <None>

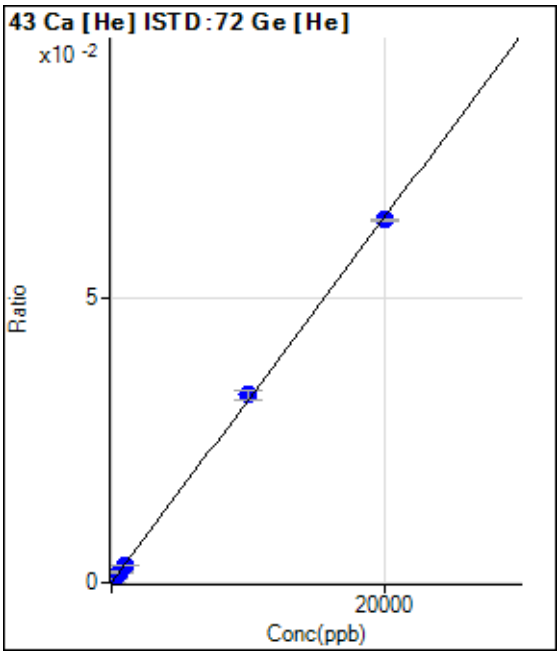
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	128419.33	0.1850	P	1.2
2	☐	200.000	196.550	278995.15	0.3996	P	0.8
3	☐	500.000	489.935	507812.43	0.7200	P	0.4
4	☐	1000.000	1010.304	900013.14	1.2881	A	2.5
5	☐	10000.00	9992.037	7644615.93	11.0945	A	1.9
6	☐	20000.00	20003.75	14945588.53	22.0255	A	1.4

y = 0.0011 * x + 0.1850
R = 1.0000
DL = 5.92
BEC = 169.5

Weight: <None>
Min Conc: <None>

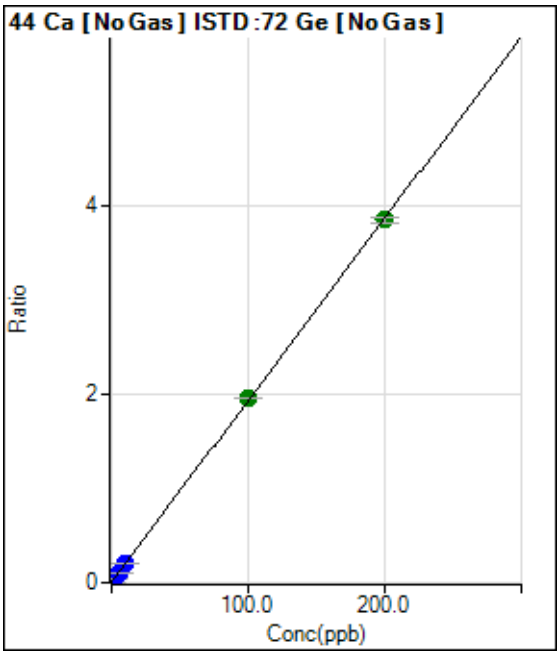


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	23.33	0.0000	P	65.7
2	☐	200.000	200.542	473.35	0.0007	P	20.4
3	☐	500.000	520.666	1203.41	0.0017	P	20.6
4	☐	1000.000	945.359	2146.88	0.0031	P	4.6
5	☐	10000.00	10278.06	22789.11	0.0331	P	4.6
6	☐	20000.00	19863.18	43355.16	0.0639	P	0.7

y = 3.2151E-006 * x + 3.3638E-005
R = 0.9999
DL = 20.62
BEC = 10.46

Weight: <None>
Min Conc: <None>

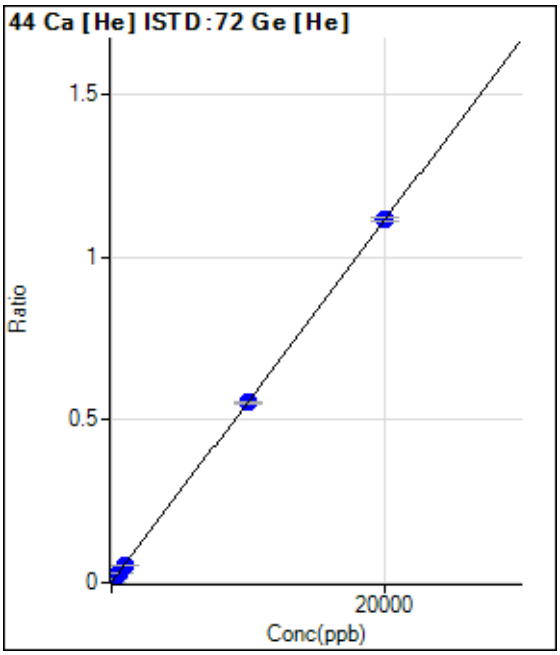
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	8732.91	0.0041	P	5.1
2	☐	2.000	1.997	91626.69	0.0427	P	0.6
3	☐	5.000	5.025	217152.36	0.1013	P	2.3
4	☐	10.000	10.225	428703.83	0.2018	P	1.2
5	☐	100.000	101.354	4109185.35	1.9642	A	0.3
6	☐	200.000	199.311	8011030.30	3.8587	A	1.7

y = 0.0193 * x + 0.0041
R = 1.0000
DL = 0.03208
BEC = 0.211

Weight: <None>
Min Conc: <None>

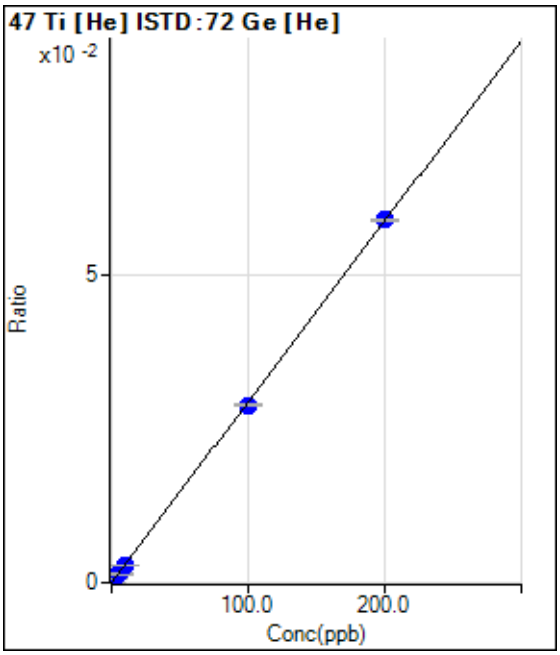


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	546.69	0.0008	P	18.5
2	☐	200.000	190.831	7965.79	0.0114	P	3.3
3	☐	500.000	483.440	19534.13	0.0277	P	2.6
4	☐	1000.000	973.385	38407.17	0.0550	P	0.7
5	☐	10000.00	9940.334	381811.75	0.5541	P	0.8
6	☐	20000.00	20031.66	757009.42	1.1157	P	0.9

y = 5.5660E-005 * x + 7.8783E-004
R = 1.0000
DL = 7.866
BEC = 14.15

Weight: <None>
Min Conc: <None>

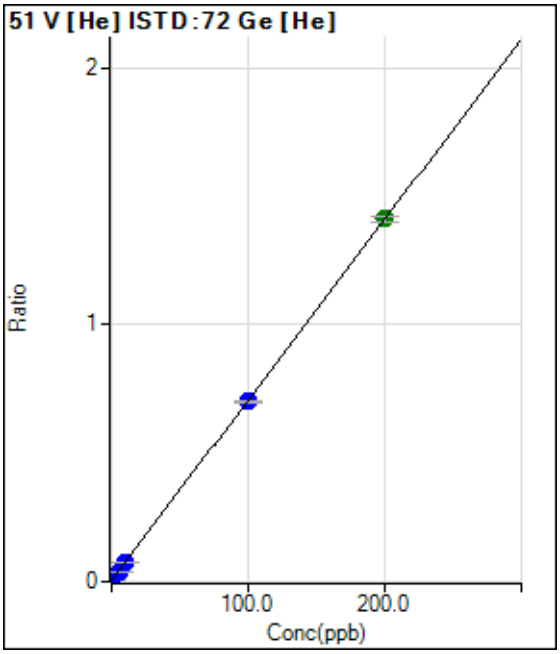
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	13.33	0.0000	P	42.9
2	☐	2.000	1.919	406.68	0.0006	P	1.3
3	☐	5.000	5.003	1050.06	0.0015	P	16.0
4	☐	10.000	9.782	2020.19	0.0029	P	4.0
5	☐	100.000	98.402	19918.05	0.0289	P	1.4
6	☐	200.000	200.811	40005.09	0.0590	P	0.4

y = 2.9351E-004 * x + 1.9193E-005
R = 1.0000
DL = 0.08424
BEC = 0.06539

Weight: <None>
Min Conc: <None>

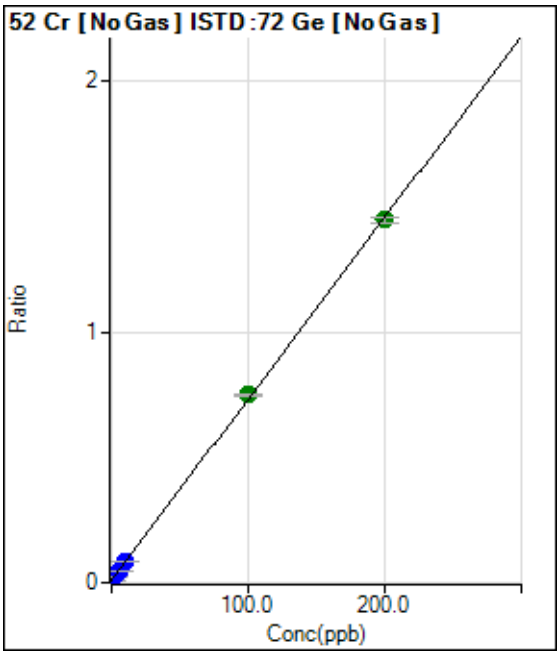


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4102.86	0.0059	P	2.1
2	☐	2.000	1.914	13505.57	0.0193	P	0.5
3	☐	5.000	4.767	27767.01	0.0394	P	1.0
4	☐	10.000	9.693	51660.06	0.0739	P	0.4
5	☐	100.000	99.023	482915.14	0.7008	P	1.0
6	☐	200.000	200.511	958686.66	1.4130	A	1.8

y = 0.0070 * x + 0.0059
R = 1.0000
DL = 0.05371
BEC = 0.8424

Weight: <None>
Min Conc: <None>

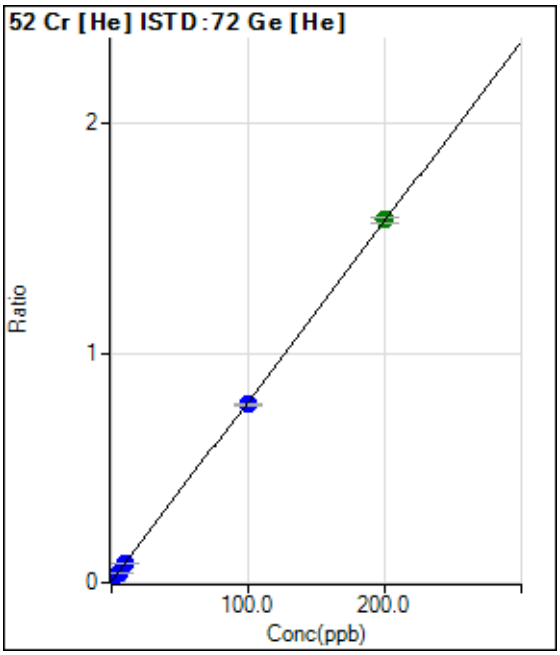
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	19674.40	0.0092	P	2.6
2	☐	2.000	2.013	50951.59	0.0237	P	1.6
3	☐	5.000	5.040	97868.01	0.0456	P	1.1
4	☐	10.000	10.124	174976.90	0.0824	P	1.9
5	☐	100.000	102.297	1566235.60	0.7487	A	1.2
6	☐	200.000	198.844	3003258.91	1.4467	A	1.5

y = 0.0072 * x + 0.0092
R = 0.9999
DL = 0.09736
BEC = 1.272

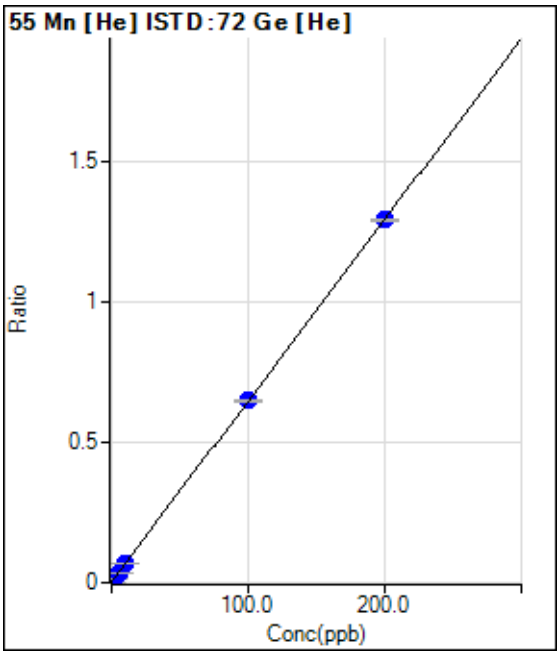
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	3803.93	0.0055	P	4.2
2	☐	2.000	2.039	14995.08	0.0215	P	3.0
3	☐	5.000	4.898	30978.65	0.0439	P	1.9
4	☐	10.000	9.974	58521.46	0.0838	P	1.1
5	☐	100.000	98.300	535351.20	0.7769	P	0.4
6	☐	200.000	200.853	1073166.31	1.5816	A	1.3

y = 0.0078 * x + 0.0055
R = 0.9999
DL = 0.08734
BEC = 0.6984

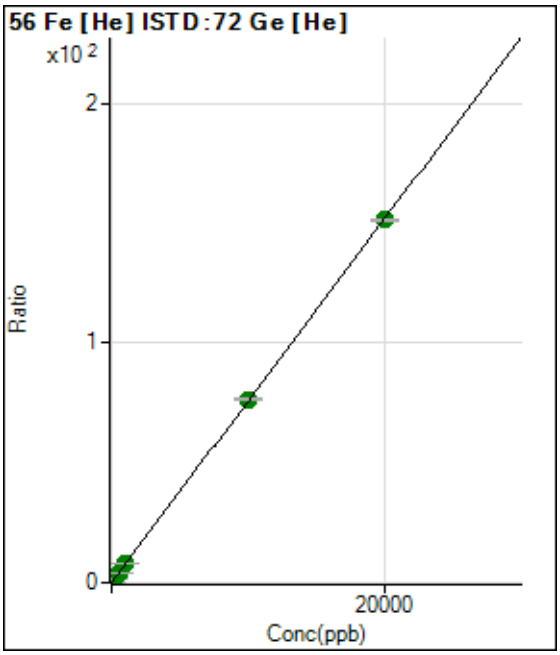
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1766.82	0.0025	P	9.6
2	☐	2.000	1.976	10671.01	0.0153	P	4.1
3	☐	5.000	4.880	23987.98	0.0340	P	0.7
4	☐	10.000	9.847	46144.89	0.0660	P	2.5
5	☐	100.000	100.084	446422.66	0.6478	P	0.7
6	☐	200.000	199.969	876514.18	1.2919	P	0.6

y = 0.0064 * x + 0.0025
R = 1.0000
DL = 0.1135
BEC = 0.3948

Weight: <None>
Min Conc: <None>

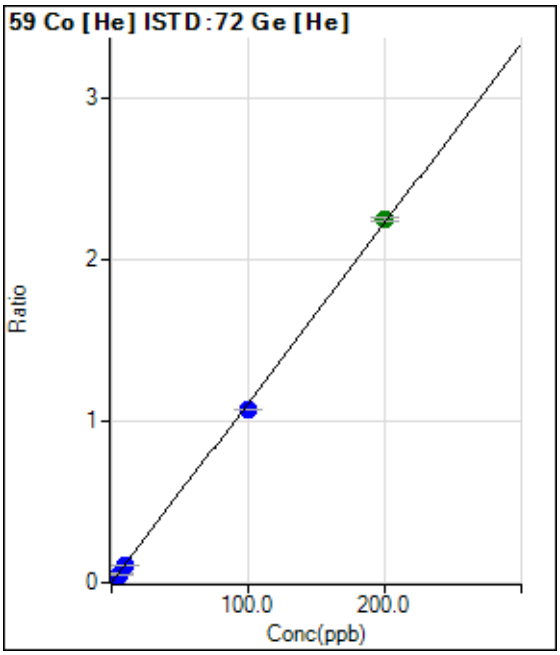


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	13430.13	0.0194	P	1.8
2	☐	200.000	201.884	1082643.03	1.5508	A	1.8
3	☐	500.000	501.049	2694485.38	3.8202	A	1.1
4	☐	1000.000	1013.739	5386461.17	7.7094	A	2.0
5	☐	10000.00	10095.62	52787539.21	76.6034	A	0.7
6	☐	20000.00	19951.45	102704068.4	151.368	A	0.3

y = 0.0076 * x + 0.0194
R = 1.0000
DL = 0.1374
BEC = 2.551

Weight: <None>
Min Conc: <None>

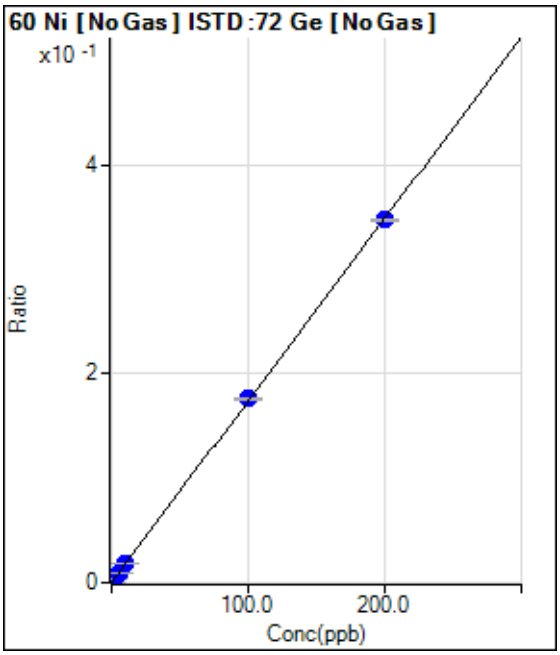
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	33.33	0.0000	P	75.6
2	☐	2.000	1.884	14688.12	0.0210	P	4.0
3	☐	5.000	4.772	37528.52	0.0532	P	3.4
4	☐	10.000	9.576	74587.09	0.1067	P	0.5
5	☐	100.000	96.338	739721.81	1.0735	P	0.6
6	☐	200.000	201.859	1526007.06	2.2492	A	1.1

y = 0.0111 * x + 4.8018E-005
R = 0.9998
DL = 0.009775
BEC = 0.00431

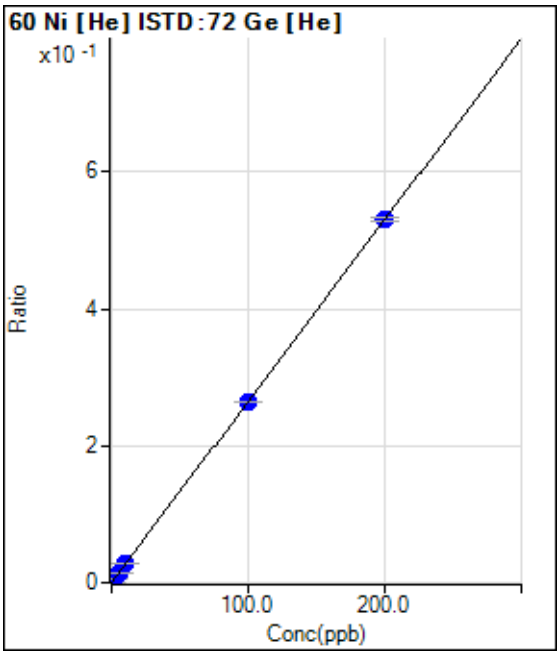
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	413.35	0.0002	P	4.7
2	☐	2.000	2.063	8122.56	0.0038	P	1.1
3	☐	5.000	4.979	19010.27	0.0089	P	3.2
4	☐	10.000	10.155	37979.88	0.0179	P	1.2
5	☐	100.000	101.033	368511.39	0.1762	P	1.7
6	☐	200.000	199.476	721702.54	0.3476	P	0.7

y = 0.0017 * x + 1.9318E-004
R = 1.0000
DL = 0.0156
BEC = 0.1109

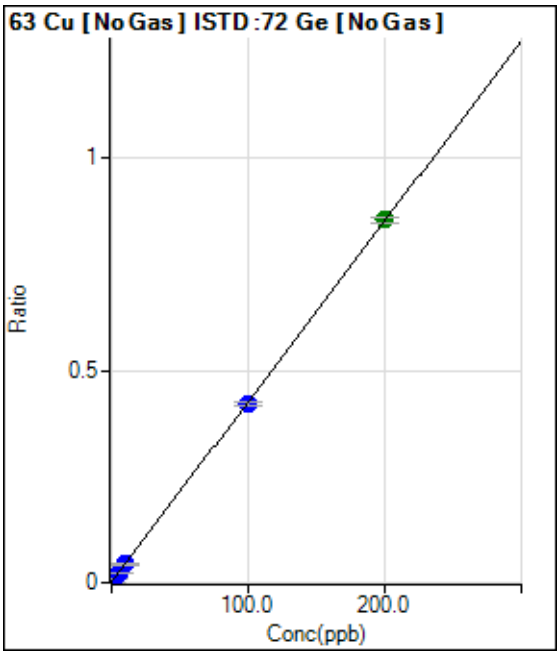
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	90.00	0.0001	P	0.3
2	☐	2.000	2.087	3947.30	0.0057	P	5.8
3	☐	5.000	4.978	9390.02	0.0133	P	0.7
4	☐	10.000	10.122	18819.89	0.0269	P	0.8
5	☐	100.000	99.856	182307.53	0.2645	P	0.2
6	☐	200.000	200.066	359532.01	0.5299	P	1.1

y = 0.0026 * x + 1.2967E-004
R = 1.0000
DL = 0.0004827
BEC = 0.04897

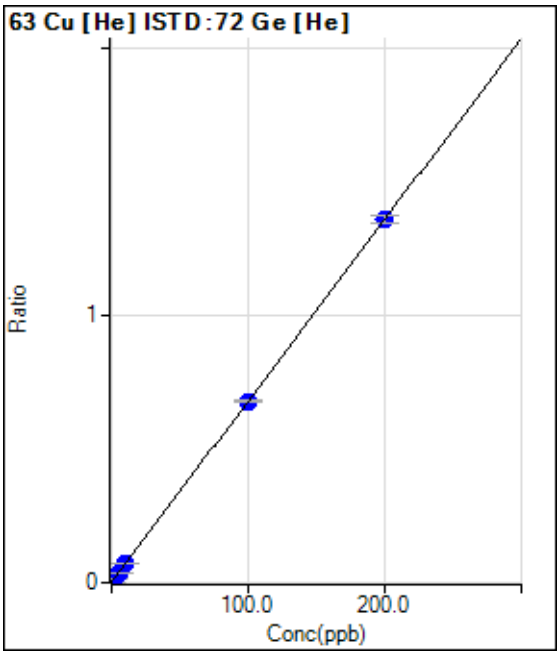
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2376.93	0.0011	P	4.9
2	☐	2.000	1.875	19484.22	0.0091	P	2.0
3	☐	5.000	4.875	46824.36	0.0218	P	4.0
4	☐	10.000	9.943	92140.88	0.0434	P	1.7
5	☐	100.000	98.504	878314.15	0.4199	P	2.0
6	☐	200.000	200.755	1774057.53	0.8546	A	1.9

y = 0.0043 * x + 0.0011
R = 1.0000
DL = 0.03844
BEC = 0.2614

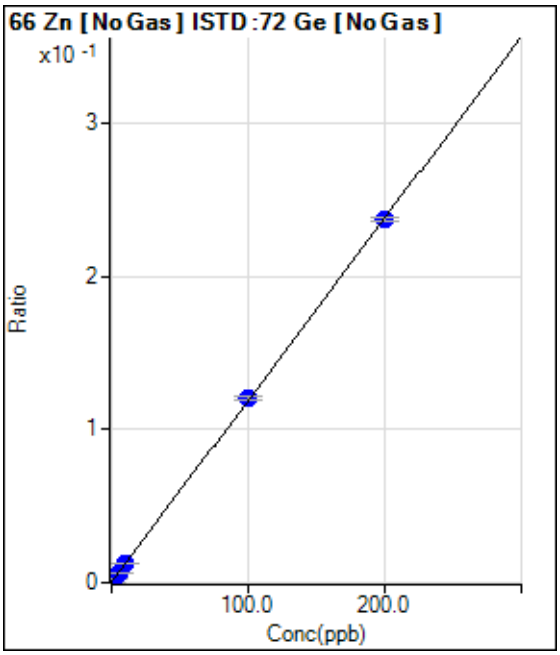
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	983.38	0.0014	P	4.2
2	☐	2.000	1.994	10427.52	0.0149	P	6.4
3	☐	5.000	4.908	24472.29	0.0347	P	1.9
4	☐	10.000	10.035	48530.34	0.0695	P	2.4
5	☐	100.000	100.017	468287.56	0.6795	P	0.2
6	☐	200.000	199.992	920881.78	1.3574	P	2.1

y = 0.0068 * x + 0.0014
R = 1.0000
DL = 0.02615
BEC = 0.209

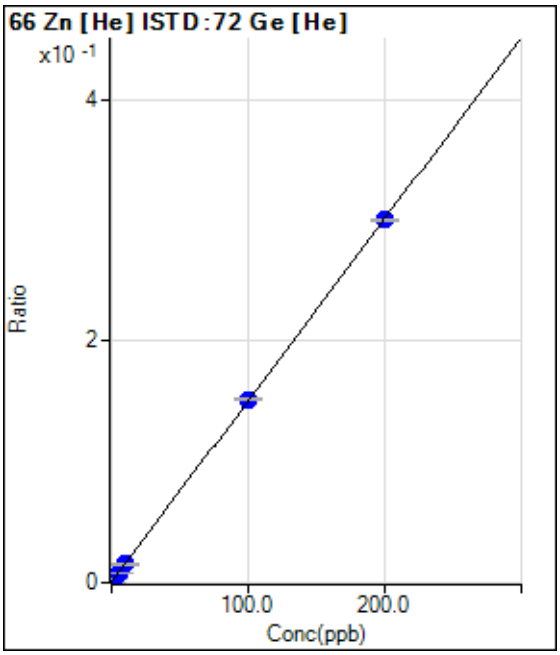
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	626.69	0.0003	P	29.2
2	☐	2.000	1.873	5394.50	0.0025	P	5.3
3	☐	5.000	5.037	13443.56	0.0063	P	1.9
4	☐	10.000	9.986	25788.16	0.0121	P	1.7
5	☐	100.000	101.425	252361.26	0.1206	P	1.4
6	☐	200.000	199.288	491509.50	0.2368	P	1.1

y = 0.0012 * x + 2.9278E-004
R = 1.0000
DL = 0.2161
BEC = 0.2468

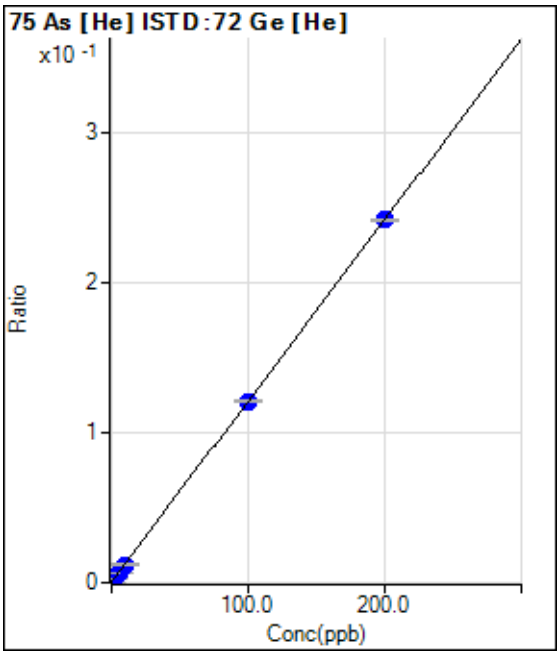
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	266.68	0.0004	P	12.3
2	☐	2.000	1.855	2213.56	0.0032	P	1.0
3	☐	5.000	4.842	5401.17	0.0077	P	7.6
4	☐	10.000	9.816	10574.28	0.0151	P	3.9
5	☐	100.000	100.860	104691.33	0.1519	P	0.6
6	☐	200.000	199.584	203721.61	0.3003	P	0.8

y = 0.0015 * x + 3.8432E-004
R = 1.0000
DL = 0.09465
BEC = 0.2558

Weight: <None>
Min Conc: <None>

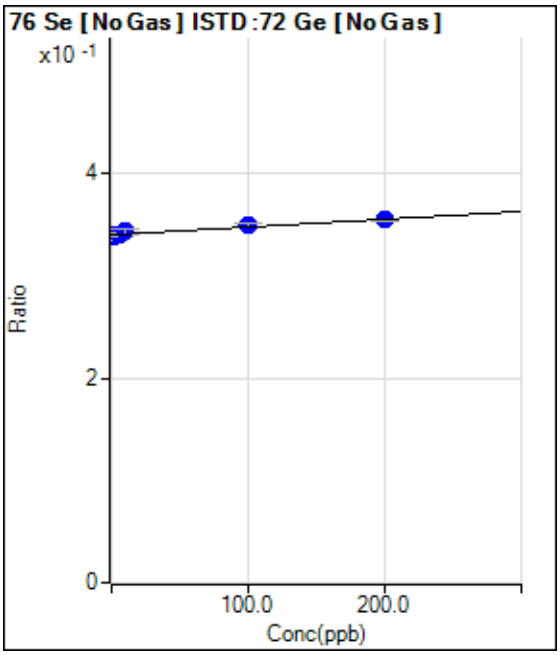


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	317.79	0.0005	P	8.8
2	☐	2.000	1.910	1925.71	0.0028	P	1.6
3	☐	5.000	4.725	4337.39	0.0061	P	2.2
4	☐	10.000	9.667	8458.24	0.0121	P	2.6
5	☐	100.000	99.868	83221.19	0.1208	P	0.9
6	☐	200.000	200.091	163860.94	0.2415	P	0.8

y = 0.0012 * x + 4.5777E-004
R = 1.0000
DL = 0.1006
BEC = 0.38

Weight: <None>
Min Conc: <None>

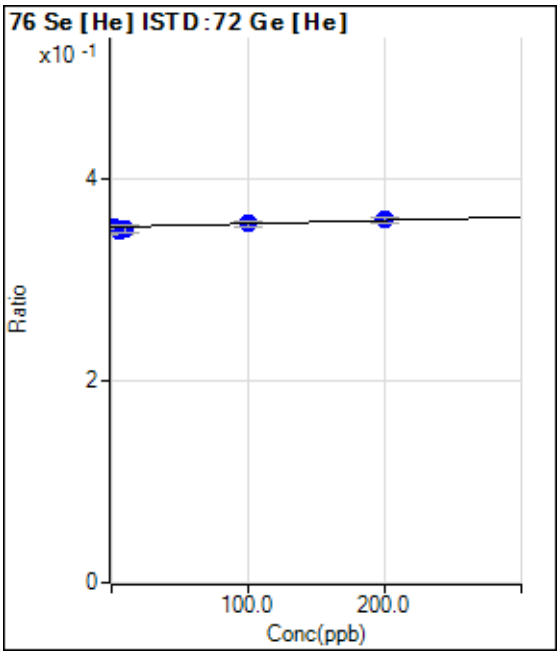
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	727412.57	0.3400	P	0.5
2	☐	2.000	-29.630	724616.68	0.3377	P	1.4
3	☐	5.000	-2.077	728842.23	0.3398	P	1.0
4	☐	10.000	48.900	730107.75	0.3437	P	1.7
5	☐	100.000	115.843	729778.82	0.3489	P	1.0
6	☐	200.000	190.626	736115.51	0.3546	P	0.4

y = 7.6366E-005 * x + 0.3400
R = 0.9585
DL = 61.1
BEC = 4452

Weight: <None>
Min Conc: <None>

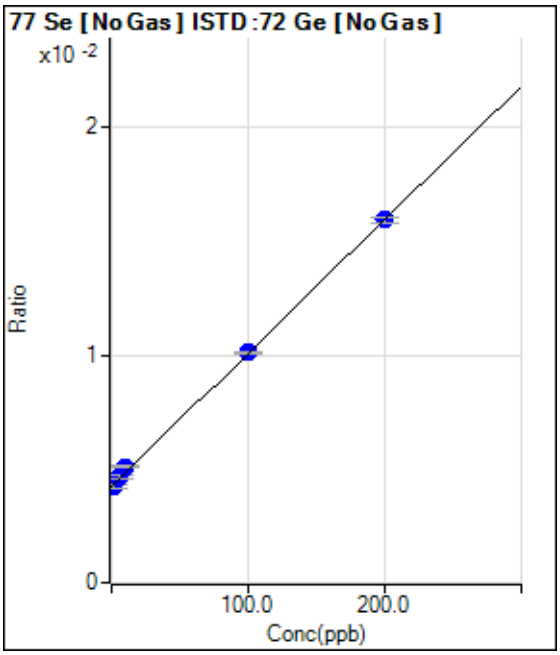


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	244719.10	0.3526	P	1.0
2	☐	2.000	12.062	246438.62	0.3530	P	1.0
3	☐	5.000	-144.691	245345.07	0.3478	P	1.6
4	☐	10.000	-64.315	244886.86	0.3505	P	1.8
5	☐	100.000	89.892	245009.27	0.3555	P	1.3
6	☐	200.000	212.411	243956.77	0.3596	P	1.4

y = 3.2851E-005 * x + 0.3526
R = 0.8815
DL = 335.5
BEC = 1.073E+04

Weight: <None>
Min Conc: <None>

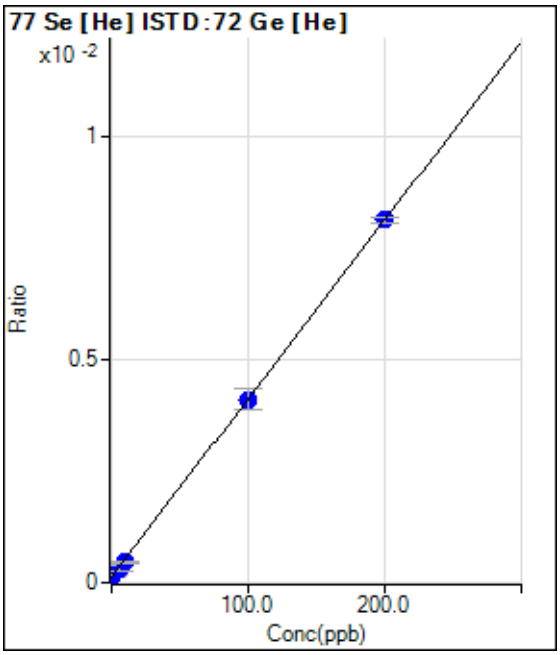
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	9059.87	0.0042	P	3.3
2	☐	2.000	0.340	9126.57	0.0043	P	4.5
3	☐	5.000	7.334	10003.90	0.0047	P	2.8
4	☐	10.000	14.732	10831.15	0.0051	P	1.6
5	☐	100.000	100.191	21160.16	0.0101	P	1.1
6	☐	200.000	199.626	33111.02	0.0159	P	1.8

y = 5.8684E-005 * x + 0.0042
R = 0.9996
DL = 7.179
BEC = 72.16

Weight: <None>
Min Conc: <None>

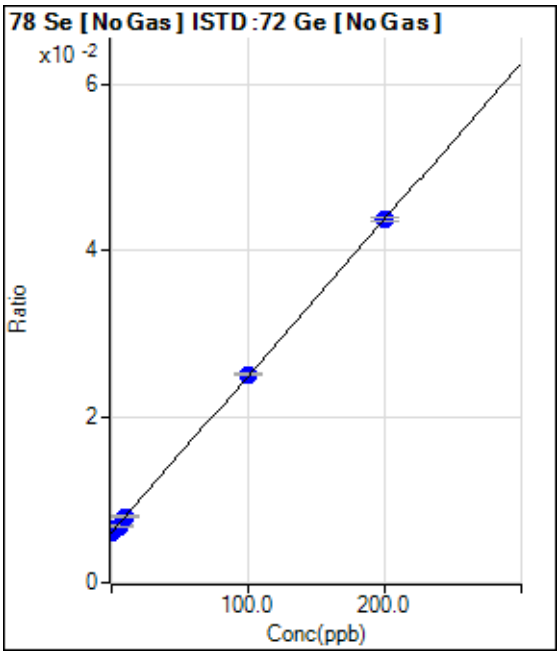


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	90.00	0.0001	P	11.3
2	☐	2.000	1.651	136.67	0.0002	P	15.5
3	☐	5.000	4.656	223.34	0.0003	P	35.3
4	☐	10.000	8.311	323.34	0.0005	P	6.7
5	☐	100.000	99.748	2843.69	0.0041	P	10.9
6	☐	200.000	200.222	5527.91	0.0081	P	1.8

y = 4.0046E-005 * x + 1.2970E-004
R = 1.0000
DL = 1.102
BEC = 3.239

Weight: <None>
Min Conc: <None>

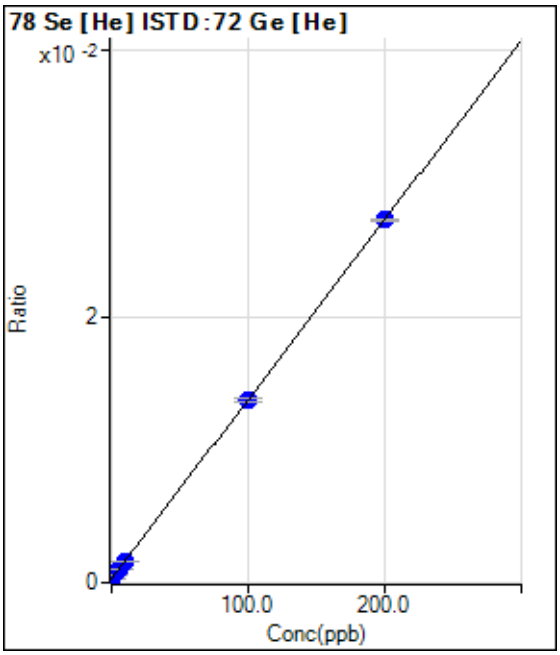
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	12976.40	0.0061	P	3.4
2	☐	2.000	2.102	13864.03	0.0065	P	6.1
3	☐	5.000	3.962	14611.46	0.0068	P	1.0
4	☐	10.000	9.740	16784.01	0.0079	P	3.2
5	☐	100.000	100.925	52525.64	0.0251	P	0.9
6	☐	200.000	199.575	90771.54	0.0437	P	0.9

y = 1.8869E-004 * x + 0.0061
R = 1.0000
DL = 3.288
BEC = 32.14

Weight: <None>
Min Conc: <None>

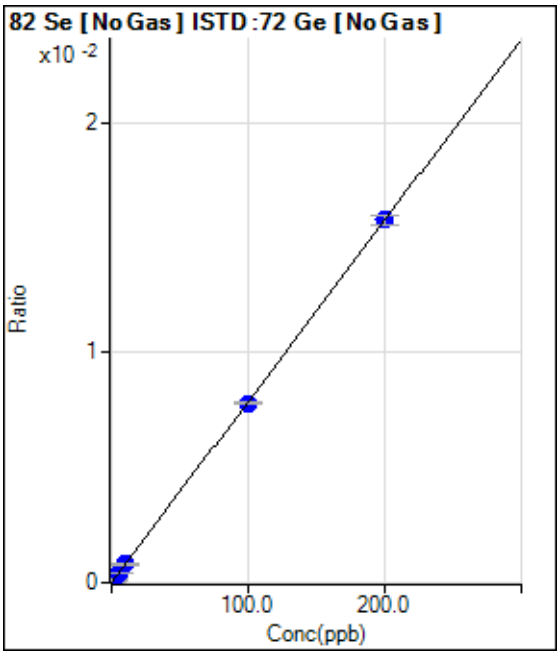


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	191.33	0.0003	P	10.2
2	☐	2.000	2.075	388.01	0.0006	P	1.9
3	☐	5.000	5.114	681.35	0.0010	P	3.5
4	☐	10.000	9.702	1108.05	0.0016	P	5.3
5	☐	100.000	99.935	9484.69	0.0138	P	1.7
6	☐	200.000	200.044	18505.35	0.0273	P	0.3

y = 1.3496E-004 * x + 2.7573E-004
R = 1.0000
DL = 0.6278
BEC = 2.043

Weight: <None>
Min Conc: <None>

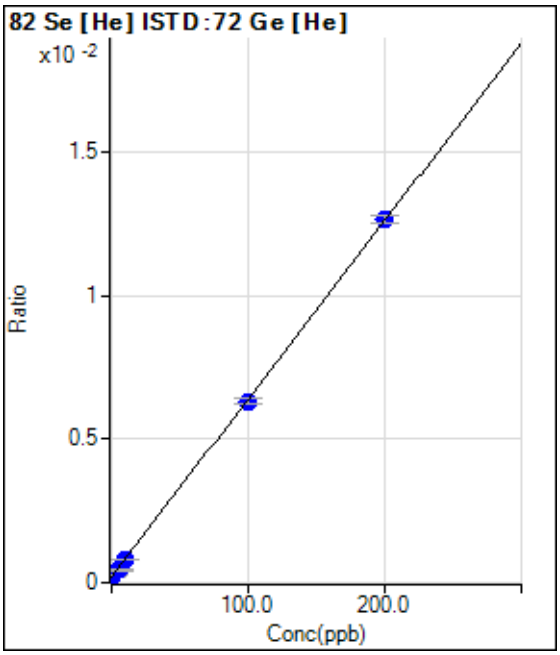
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	-47.84	0.0000	P	-178.9
2	☐	2.000	1.670	234.98	0.0001	P	65.7
3	☐	5.000	5.042	805.87	0.0004	P	8.0
4	☐	10.000	10.416	1698.71	0.0008	P	10.9
5	☐	100.000	99.061	16312.69	0.0078	P	1.0
6	☐	200.000	200.451	32806.75	0.0158	P	2.4

y = 7.8946E-005 * x - 2.2463E-005
R = 1.0000
DL = 1.527
BEC = -0.2845

Weight: <None>
Min Conc: <None>

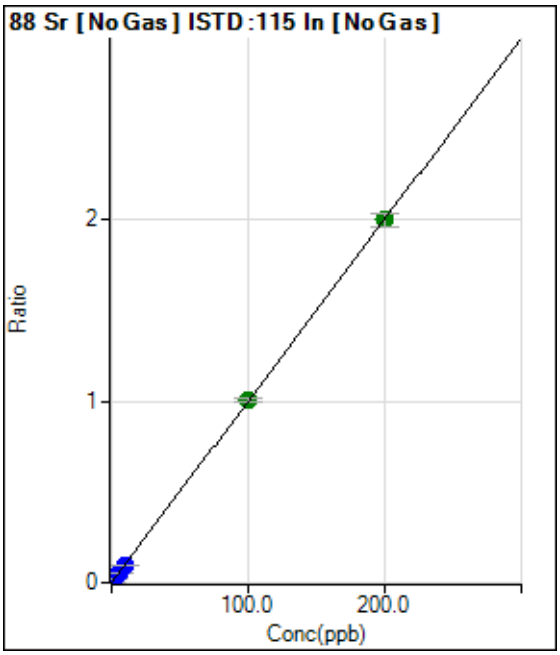


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	143.34	0.0002	P	31.1
2	☐	2.000	1.835	223.34	0.0003	P	13.4
3	☐	5.000	3.838	313.34	0.0004	P	6.1
4	☐	10.000	9.532	556.69	0.0008	P	4.5
5	☐	100.000	98.807	4360.79	0.0063	P	3.4
6	☐	200.000	200.651	8572.88	0.0126	P	2.2

y = 6.1943E-005 * x + 2.0638E-004
R = 1.0000
DL = 3.112
BEC = 3.332

Weight: <None>
Min Conc: <None>

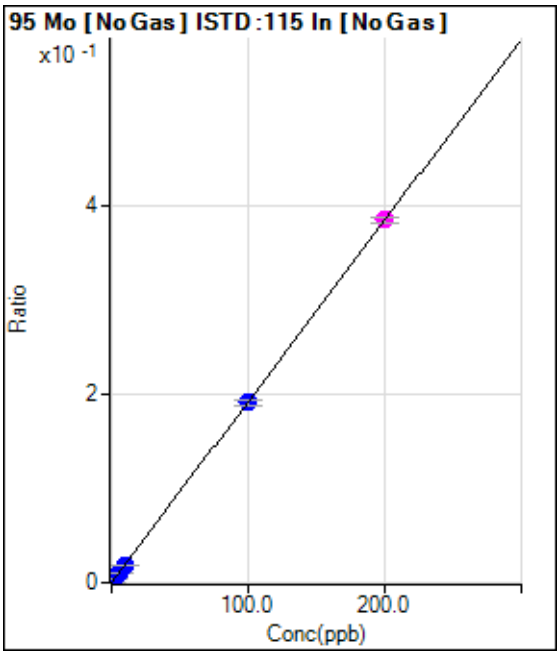
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1343.43	0.0005	P	10.1
2	☐	2.000	1.873	52359.32	0.0192	P	1.6
3	☐	5.000	4.780	131241.93	0.0483	P	0.6
4	☐	10.000	9.487	261107.26	0.0954	P	0.6
5	☐	100.000	100.306	2644517.98	1.0035	A	2.1
6	☐	200.000	199.879	5225902.53	1.9992	A	3.4

y = 0.0100 * x + 4.9411E-004
R = 1.0000
DL = 0.01501
BEC = 0.04941

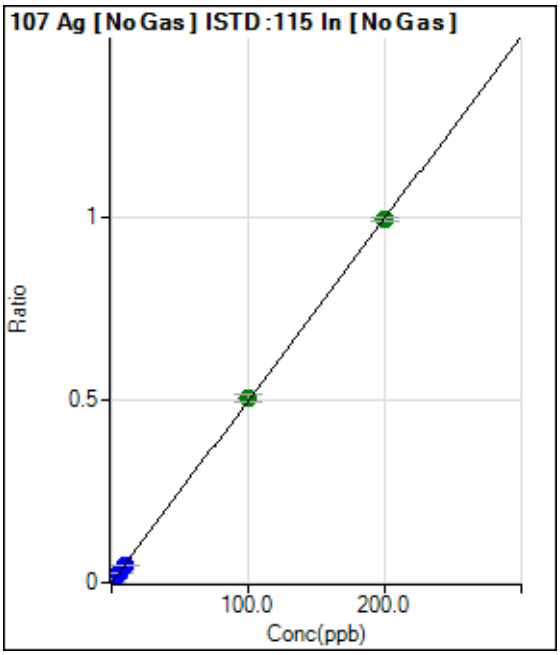
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	50.00	0.0000	P	35.7
2	☐	2.000	1.924	10147.36	0.0037	P	1.3
3	☐	5.000	4.843	25397.84	0.0093	P	0.3
4	☐	10.000	9.588	50606.31	0.0185	P	1.0
5	☐	100.000	99.342	504255.51	0.1914	P	2.3
6	☐	200.000	200.354	1008879.65	0.3859	M	1.3

y = 0.0019 * x + 1.8426E-005
R = 1.0000
DL = 0.01024
BEC = 0.009567

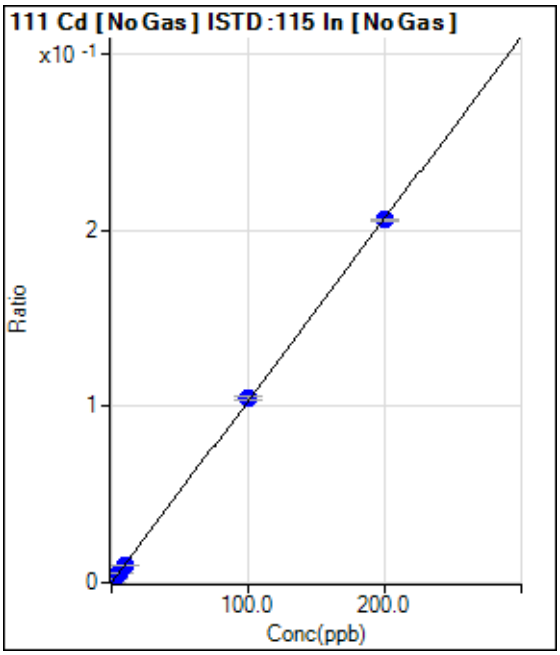
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	160.00	0.0001	P	28.3
2	☐	2.000	1.904	25945.63	0.0095	P	1.6
3	☐	5.000	4.767	64574.07	0.0238	P	0.4
4	☐	10.000	9.704	132276.17	0.0483	P	1.3
5	☐	100.000	101.404	1328584.30	0.5043	A	4.2
6	☐	200.000	199.319	2591097.26	0.9912	A	1.0

y = 0.0050 * x + 5.8942E-005
R = 1.0000
DL = 0.01005
BEC = 0.01185

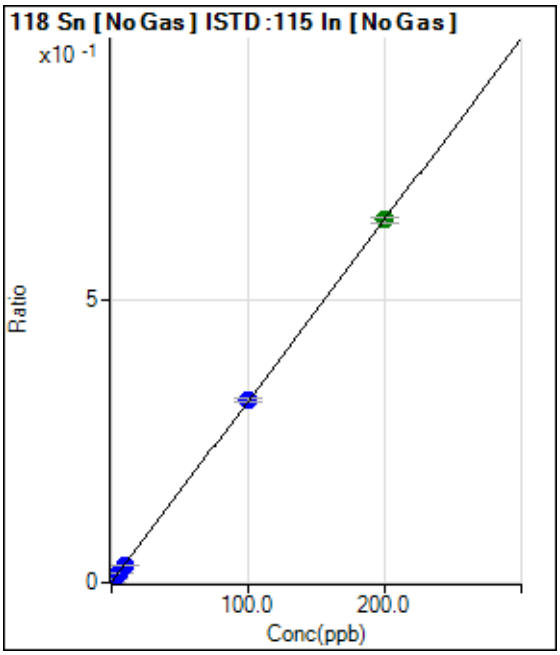
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	13.33	0.0000	P	86.6
2	☐	2.000	1.908	5384.55	0.0020	P	5.2
3	☐	5.000	4.853	13650.59	0.0050	P	2.2
4	☐	10.000	9.859	27923.28	0.0102	P	0.8
5	☐	100.000	101.223	275812.55	0.1047	P	2.0
6	☐	200.000	199.400	538979.20	0.2062	P	0.3

y = 0.0010 * x + 4.8773E-006
R = 1.0000
DL = 0.01226
BEC = 0.004718

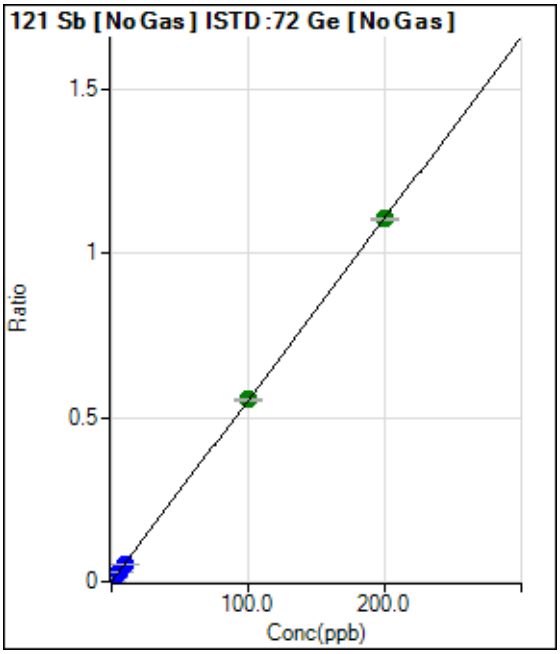
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1323.42	0.0005	P	6.9
2	☐	2.000	1.909	17992.65	0.0066	P	6.0
3	☐	5.000	4.844	43522.43	0.0160	P	1.2
4	☐	10.000	9.631	85859.65	0.0314	P	1.2
5	☐	100.000	100.163	847408.76	0.3216	P	2.3
6	☐	200.000	199.942	1676551.59	0.6414	A	1.9

y = 0.0032 * x + 4.8650E-004
R = 1.0000
DL = 0.03142
BEC = 0.1518

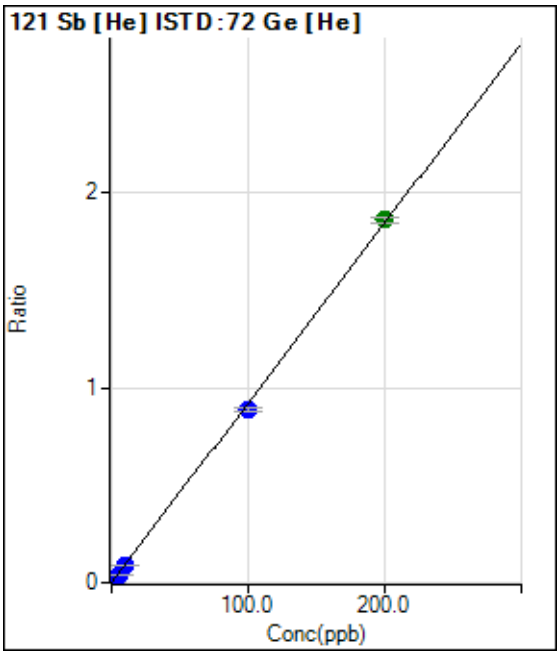
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	430.02	0.0002	P	19.6
2	☐	2.000	1.861	22526.25	0.0105	P	1.3
3	☐	5.000	4.824	57666.64	0.0269	P	2.5
4	☐	10.000	9.769	115192.57	0.0542	P	4.4
5	☐	100.000	100.341	1161695.11	0.5553	A	0.6
6	☐	200.000	199.847	2295859.34	1.1058	A	0.6

y = 0.0055 * x + 2.0093E-004
R = 1.0000
DL = 0.02138
BEC = 0.03632

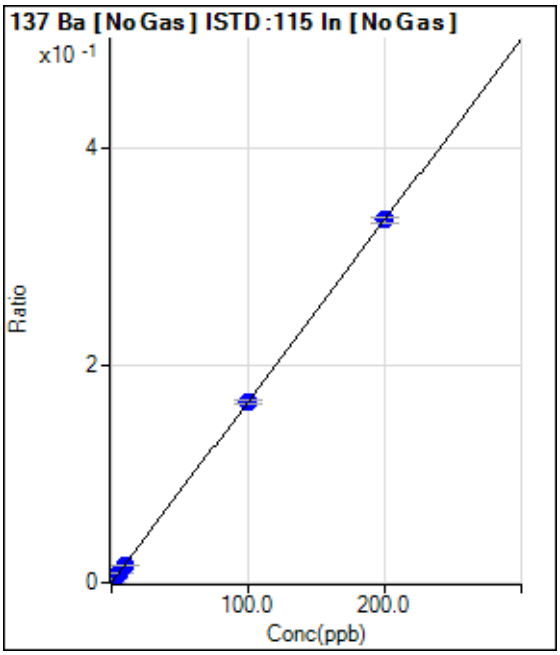
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	213.34	0.0003	P	22.0
2	☐	2.000	1.836	12029.07	0.0172	P	0.8
3	☐	5.000	4.626	30285.26	0.0429	P	1.1
4	☐	10.000	9.330	60291.79	0.0863	P	0.3
5	☐	100.000	96.372	612148.93	0.8884	P	1.5
6	☐	200.000	201.859	1262334.83	1.8605	A	1.3

y = 0.0092 * x + 3.0731E-004
R = 0.9998
DL = 0.02201
BEC = 0.03335

Weight: <None>
Min Conc: <None>

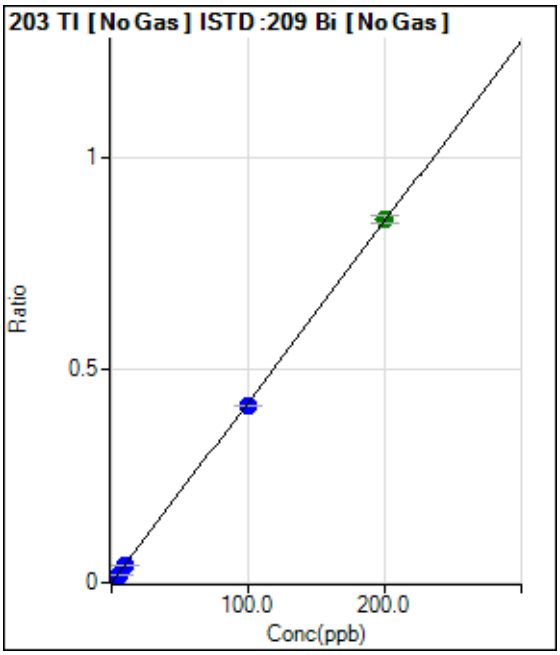


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	220.01	0.0001	P	11.1
2	☐	2.000	1.898	8826.49	0.0032	P	0.8
3	☐	5.000	4.815	21998.89	0.0081	P	2.6
4	☐	10.000	9.627	44085.02	0.0161	P	2.2
5	☐	100.000	99.635	437151.43	0.1659	P	2.8
6	☐	200.000	200.207	871177.83	0.3333	P	1.5

y = 0.0017 * x + 8.0844E-005
R = 1.0000
DL = 0.01623
BEC = 0.04858

Weight: <None>
Min Conc: <None>

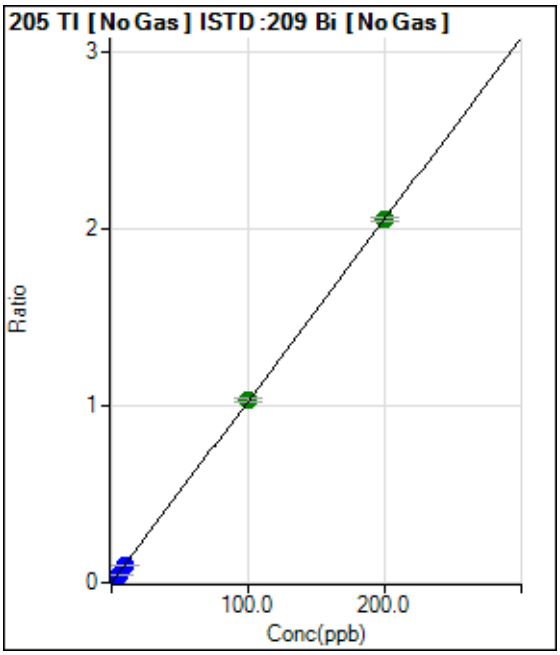
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	53.33	0.0000	P	65.1
2	☐	2.000	1.848	20089.72	0.0079	P	2.8
3	☐	5.000	4.734	52125.72	0.0201	P	1.0
4	☐	10.000	9.829	105301.46	0.0417	P	1.2
5	☐	100.000	98.258	1053303.71	0.4168	P	0.4
6	☐	200.000	200.887	2120172.52	0.8522	A	2.2

y = 0.0042 * x + 2.0878E-005
R = 0.9999
DL = 0.009612
BEC = 0.004922

Weight: <None>
Min Conc: <None>

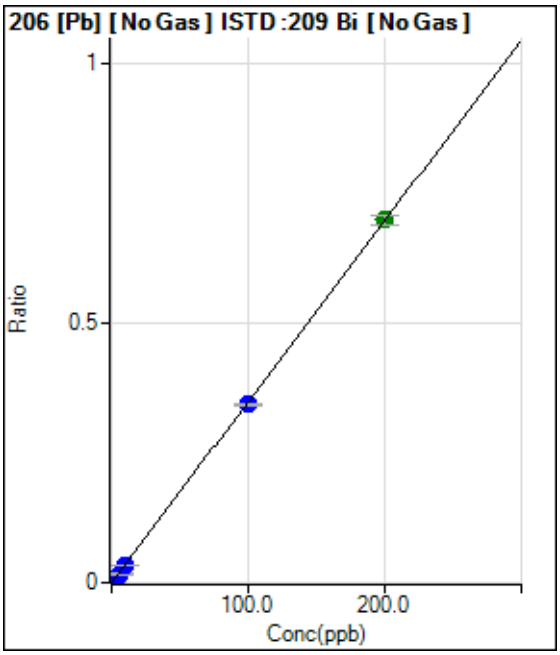


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	86.67	0.0000	P	51.8
2	☐	2.000	1.854	48661.91	0.0190	P	2.5
3	☐	5.000	4.650	123715.88	0.0477	P	2.6
4	☐	10.000	9.721	251697.18	0.0997	P	0.8
5	☐	100.000	100.609	2606829.28	1.0316	A	1.5
6	☐	200.000	199.720	5096070.03	2.0479	A	1.0

y = 0.0103 * x + 3.4236E-005
R = 1.0000
DL = 0.005189
BEC = 0.003339

Weight: <None>
Min Conc: <None>

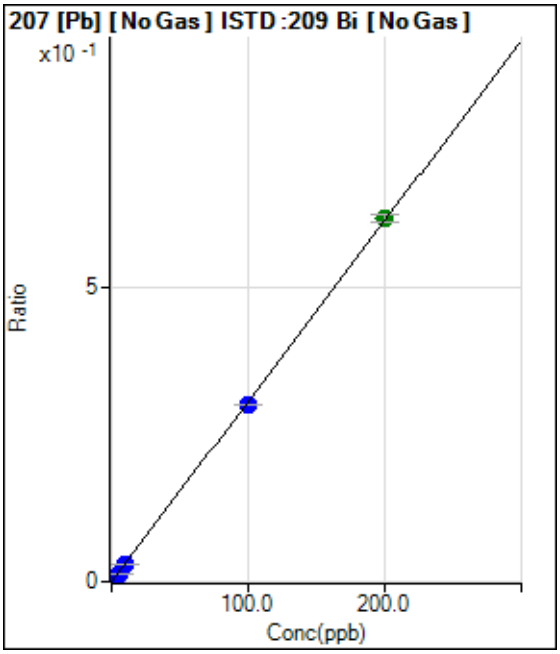
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	170.00	0.0001	P	25.7
2	☐	2.000	1.909	17165.45	0.0067	P	3.6
3	☐	5.000	4.728	42880.69	0.0165	P	2.0
4	☐	10.000	9.926	87448.76	0.0346	P	1.2
5	☐	100.000	98.667	868698.48	0.3438	P	1.1
6	☐	200.000	200.678	1739395.81	0.6991	A	2.8

y = 0.0035 * x + 6.7264E-005
R = 1.0000
DL = 0.01491
BEC = 0.01931

Weight: <None>
Min Conc: <None>

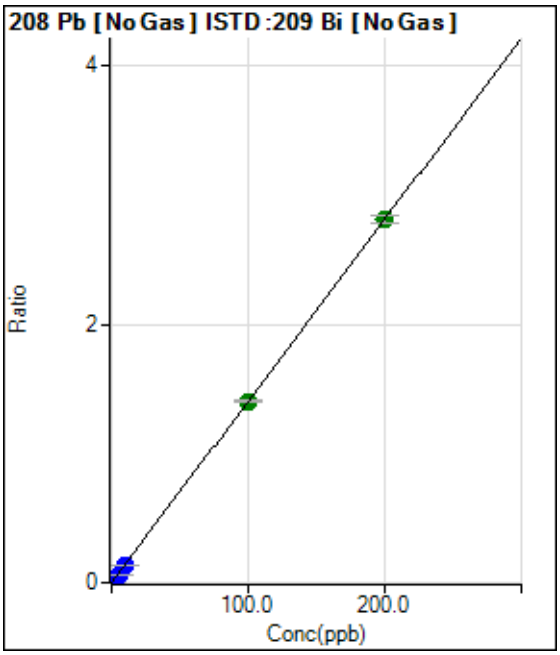


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	143.34	0.0001	P	37.0
2	☐	2.000	1.865	14782.39	0.0058	P	0.8
3	☐	5.000	4.678	37386.66	0.0144	P	1.1
4	☐	10.000	9.750	75706.30	0.0300	P	3.3
5	☐	100.000	97.788	758791.34	0.3003	P	0.5
6	☐	200.000	201.128	1536432.27	0.6175	A	2.3

y = 0.0031 * x + 5.6821E-005
R = 0.9999
DL = 0.02052
BEC = 0.01851

Weight: <None>
Min Conc: <None>

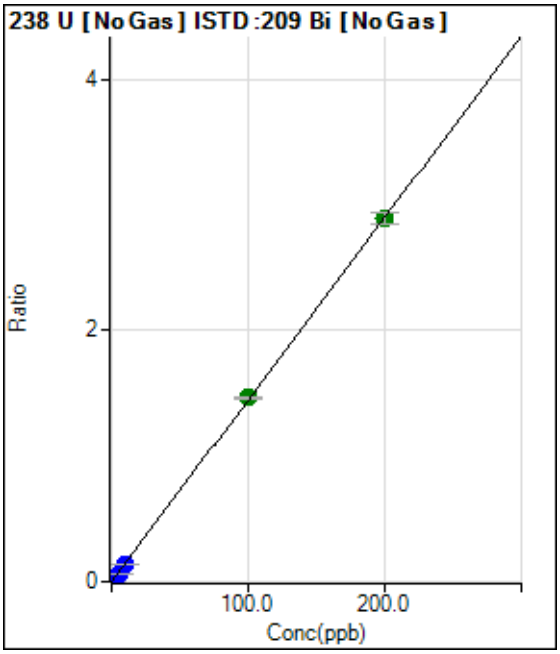
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	656.68	0.0003	P	17.3
2	☐	2.000	1.874	67859.79	0.0265	P	1.8
3	☐	5.000	4.707	171927.26	0.0663	P	1.7
4	☐	10.000	9.791	347423.54	0.1376	P	0.8
5	☐	100.000	100.141	3551009.12	1.4053	A	0.8
6	☐	200.000	199.948	6980568.75	2.8056	A	2.1

y = 0.0140 * x + 2.5944E-004
R = 1.0000
DL = 0.009597
BEC = 0.01849

Weight: <None>
Min Conc: <None>

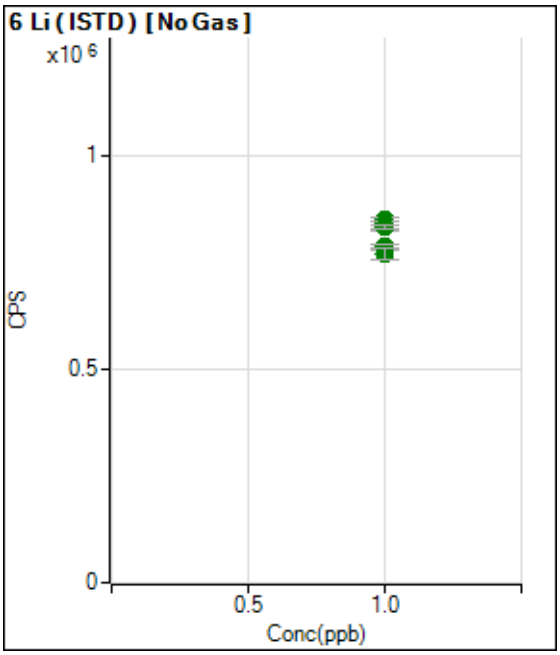


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	40.00	0.0000	P	43.9
2	☐	2.000	1.852	68618.76	0.0268	P	2.1
3	☐	5.000	4.556	171188.53	0.0660	P	2.2
4	☐	10.000	9.419	344517.43	0.1365	P	0.4
5	☐	100.000	101.071	3700484.21	1.4644	A	0.6
6	☐	200.000	199.506	7191373.85	2.8906	A	3.0

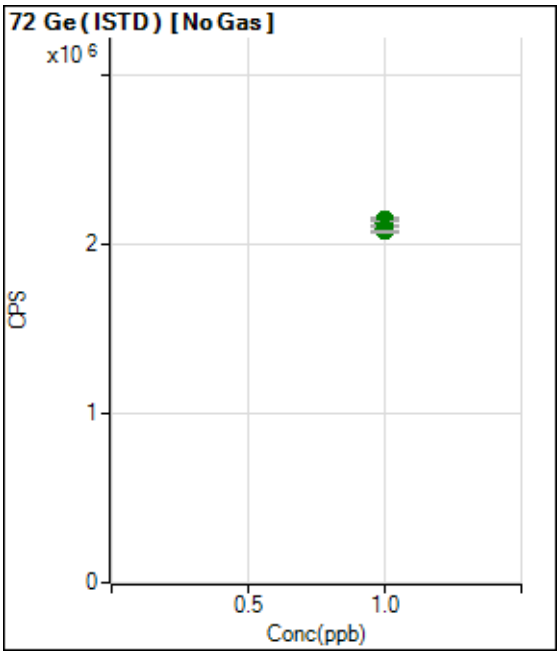
y = 0.0145 * x + 1.5811E-005
R = 1.0000
DL = 0.001437
BEC = 0.001091

Weight: <None>
Min Conc: <None>

Calibration for 162_ICV.d

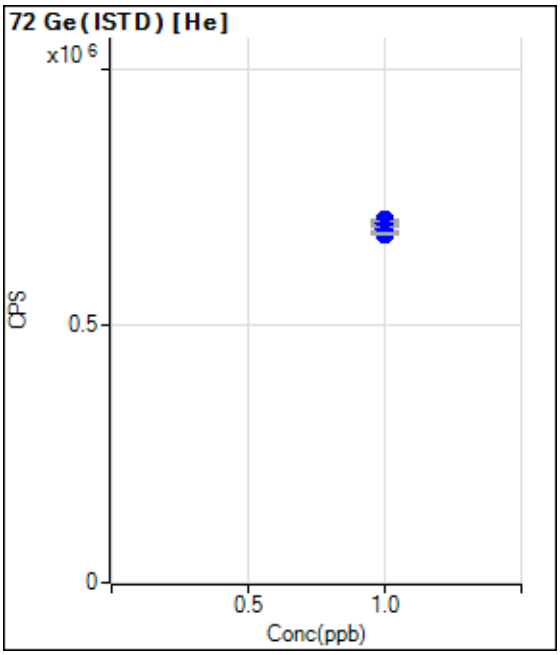


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		851396.56		A	1.0
2	☐	1.000		844098.40		A	1.3
3	☐	1.000		833751.25		A	1.4
4	☐	1.000		834919.48		A	0.8
5	☐	1.000		788191.01		A	2.1
6	☐	1.000		771890.78		A	3.5

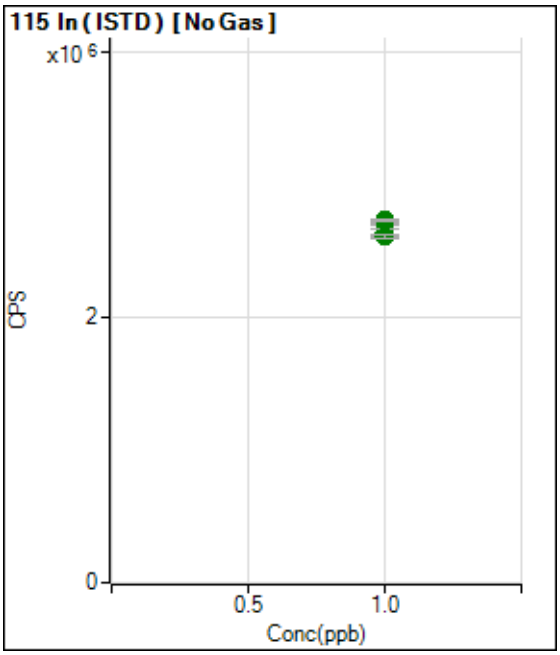


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2139407.73		A	0.4
2	☐	1.000		2145638.15		A	0.9
3	☐	1.000		2144715.12		A	0.8
4	☐	1.000		2124268.15		A	1.2
5	☐	1.000		2092022.57		A	0.9
6	☐	1.000		2076150.54		A	0.9

Calibration for 162_ICV.d

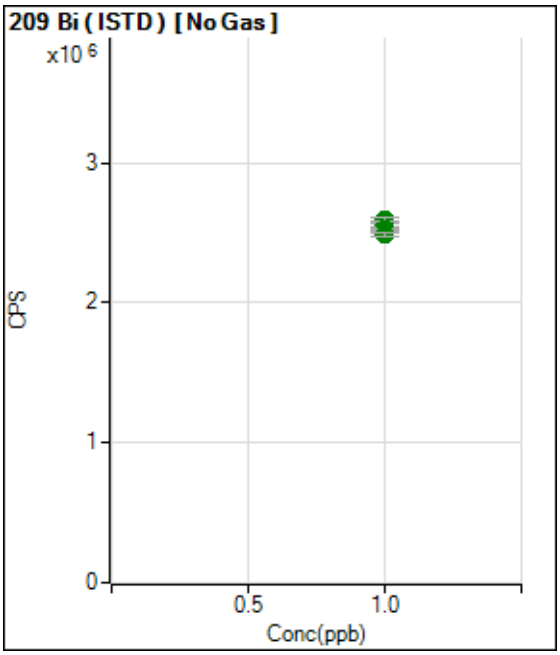


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		694064.57		P	0.3
2	☐	1.000		698154.70		P	0.5
3	☐	1.000		705354.52		P	0.7
4	☐	1.000		698779.05		P	1.1
5	☐	1.000		689128.38		P	1.0
6	☐	1.000		678517.99		P	1.0



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2719437.47		A	1.0
2	☐	1.000		2724329.72		A	1.1
3	☐	1.000		2717717.10		A	0.3
4	☐	1.000		2737982.30		A	0.7
5	☐	1.000		2636127.70		A	2.2
6	☐	1.000		2614362.72		A	1.4

Calibration for 162_ICV.d



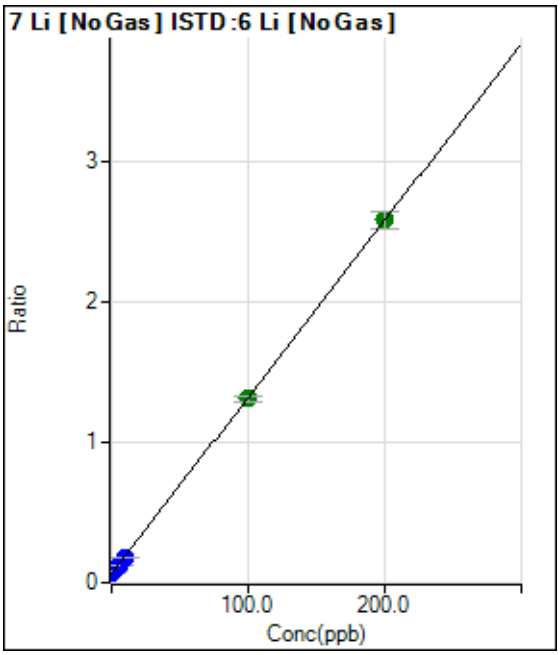
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2536806.21		A	2.3
2	☐	1.000		2556187.20		A	0.9
3	☐	1.000		2593317.67		A	1.2
4	☐	1.000		2524222.72		A	0.8
5	☐	1.000		2526930.85		A	0.6
6	☐	1.000		2488386.47		A	1.1

Calibration for 015_ICV.d

Batch Folder: C:\Agilent\ICPMH\1\DATA\121521A.b\
Analysis File: 121521A.batch.bin
DA Date-Time: 12/15/2021 7:42:15 PM
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

Level	Standard Data File	Sample Name	Acq. Date-Time
1	008CALB.d	CAL BLK	12/15/2021 11:06:53 AM
2	009CALS.d	2/10/200	12/15/2021 11:08:50 AM
3	010CALS.d	5/25/500	12/15/2021 11:10:48 AM
4	011CALS.d	10/50/100	12/15/2021 11:12:46 AM
5	012CALS.d	100/500/10K	12/15/2021 11:14:44 AM
6	013CALS.d	200/1000/20K	12/15/2021 11:16:36 AM

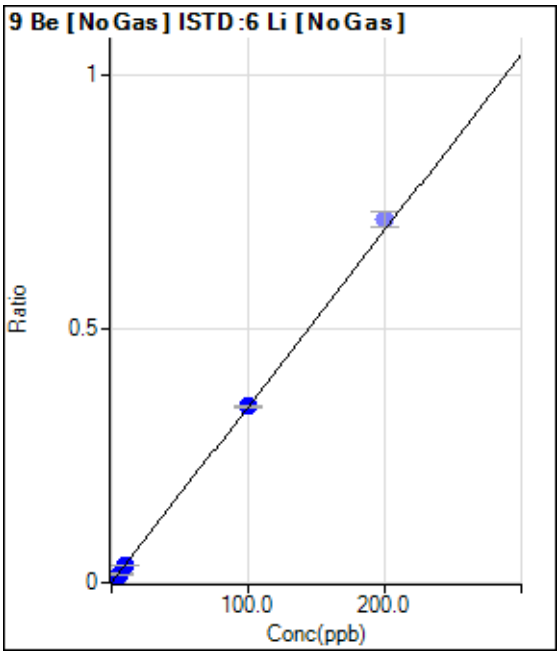
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	58628.02	0.0629	P	2.7
2	☐	2.000	1.810	78792.14	0.0857	P	0.6
3	☐	5.000	4.742	111488.67	0.1225	P	2.4
4	☐	10.000	9.165	165738.28	0.1781	P	1.1
5	☐	100.000	99.260	1150972.46	1.3101	A	3.1
6	☐	200.000	200.420	2174305.38	2.5811	A	5.1

y = 0.0126 * x + 0.0629
R = 1.0000
DL = 0.4019
BEC = 5.01

Weight: <None>
Min Conc: <None>

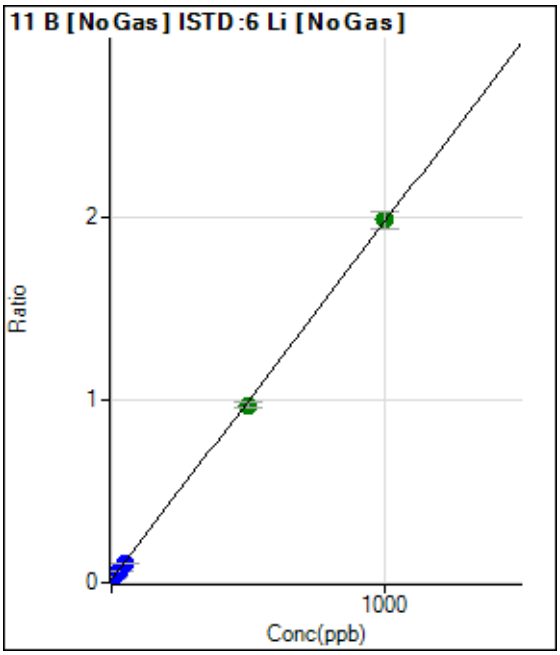


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	35.00	0.0000	P	38.2
2	☐	2.000	1.843	5911.29	0.0064	P	1.7
3	☐	5.000	4.880	15428.53	0.0170	P	2.6
4	☐	10.000	9.453	30533.13	0.0328	P	2.0
5	☐	100.000	100.064	304758.41	0.3469	P	1.9
6	☑	200.000		602014.46	0.7145	P	4.4

y = 0.0035 * x + 3.7589E-005
R = 1.0000
DL = 0.01243
BEC = 0.01084

Weight: <None>
Min Conc: <None>

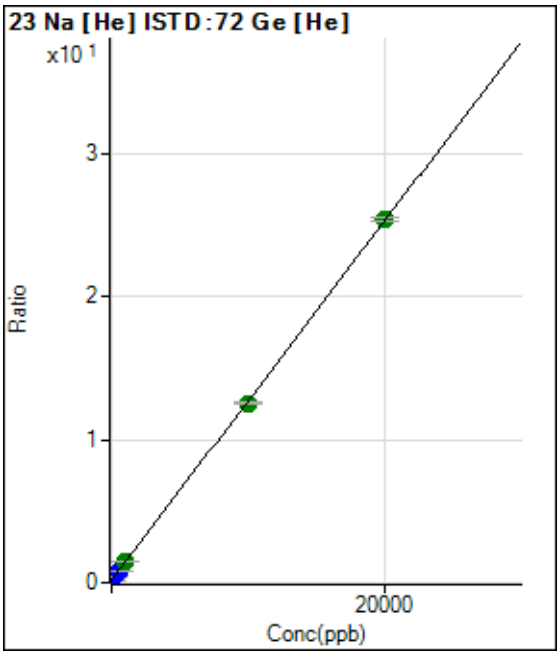
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	15086.53	0.0162	P	4.3
2	☐	10.000	8.783	30735.30	0.0334	P	1.6
3	☐	25.000	23.113	55959.36	0.0615	P	4.6
4	☐	50.000	45.927	98896.47	0.1063	P	4.1
5	☐	500.000	488.727	855953.48	0.9746	A	3.2
6	☐	1000.000	1005.900	1675507.37	1.9887	A	4.8

y = 0.0020 * x + 0.0162
R = 0.9999
DL = 1.058
BEC = 8.261

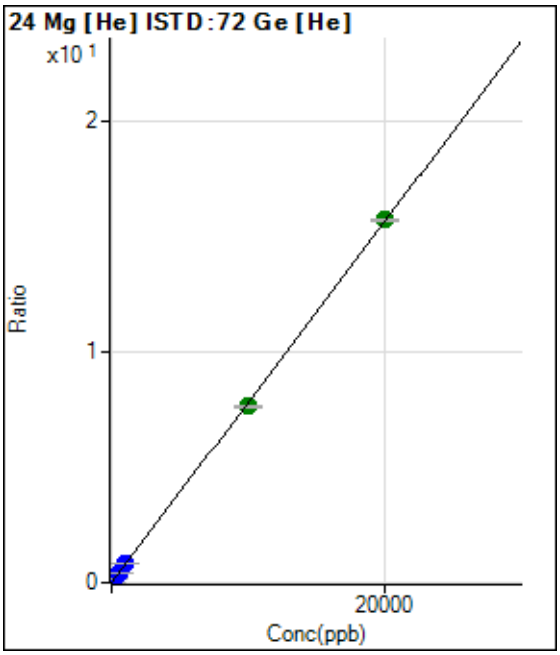
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	118768.40	0.1665	P	2.0
2	☐	200.000	198.922	295962.34	0.4164	P	0.8
3	☐	500.000	508.261	572668.50	0.8050	P	0.9
4	☐	1000.000	1023.779	1029697.20	1.4526	A	1.2
5	☐	10000.00	9853.266	8800545.91	12.5442	A	0.7
6	☐	20000.00	20071.98	17289039.74	25.3809	A	1.0

y = 0.0013 * x + 0.1665
R = 1.0000
DL = 7.979
BEC = 132.5

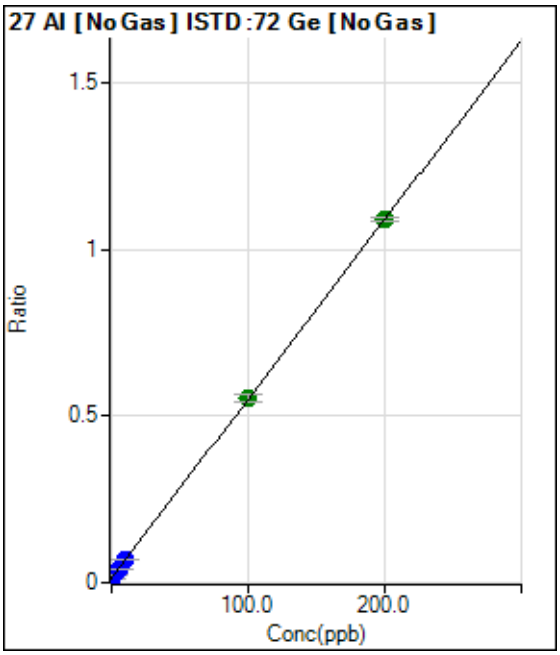
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	260.01	0.0004	P	43.2
2	☐	200.000	200.144	111362.24	0.1567	P	0.2
3	☐	500.000	512.031	284733.08	0.4002	P	1.1
4	☐	1000.000	1033.900	572602.53	0.8078	P	0.9
5	☐	10000.00	9790.616	5364572.63	7.6462	A	1.3
6	☐	20000.00	20102.69	10694104.84	15.6993	A	0.8

y = 7.8094E-004 * x + 3.6532E-004
R = 0.9999
DL = 0.6057
BEC = 0.4678

Weight: <None>
Min Conc: <None>

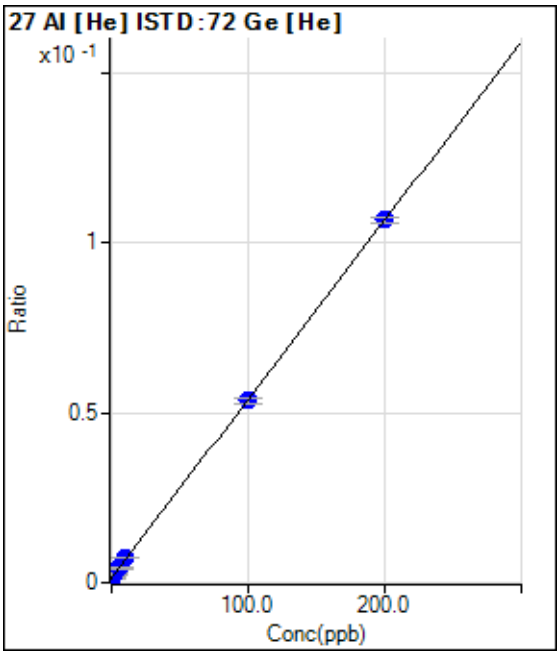


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	28716.77	0.0137	P	3.1
2	☐	2.000	2.077	51626.31	0.0249	P	1.0
3	☐	5.000	5.088	85568.91	0.0411	P	3.2
4	☐	10.000	10.424	143567.60	0.0698	P	2.6
5	☐	100.000	100.040	1114018.03	0.5518	A	4.3
6	☐	200.000	199.956	2157891.79	1.0893	A	1.1

y = 0.0054 * x + 0.0137
R = 1.0000
DL = 0.2399
BEC = 2.556

Weight: <None>
Min Conc: <None>

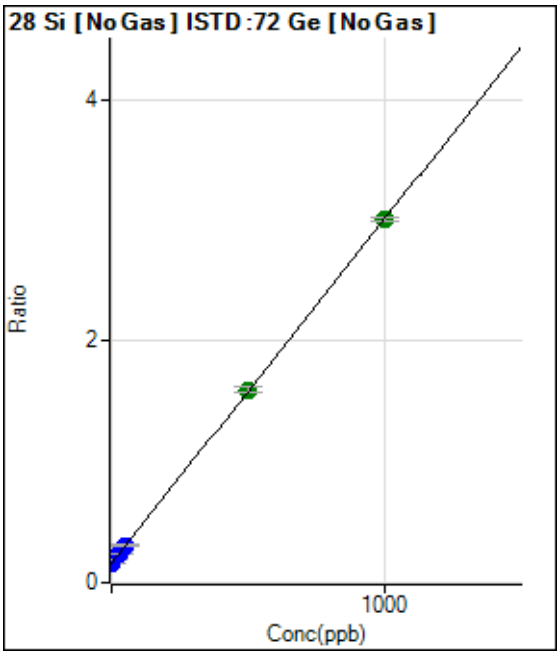
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1006.72	0.0014	P	12.2
2	☐	2.000	2.070	1776.81	0.0025	P	4.4
3	☐	5.000	5.418	3030.38	0.0043	P	9.4
4	☐	10.000	11.129	5147.71	0.0073	P	4.3
5	☐	100.000	99.176	37577.69	0.0536	P	2.6
6	☐	200.000	200.344	72726.42	0.1068	P	1.3

y = 5.2587E-004 * x + 0.0014
R = 1.0000
DL = 0.9836
BEC = 2.684

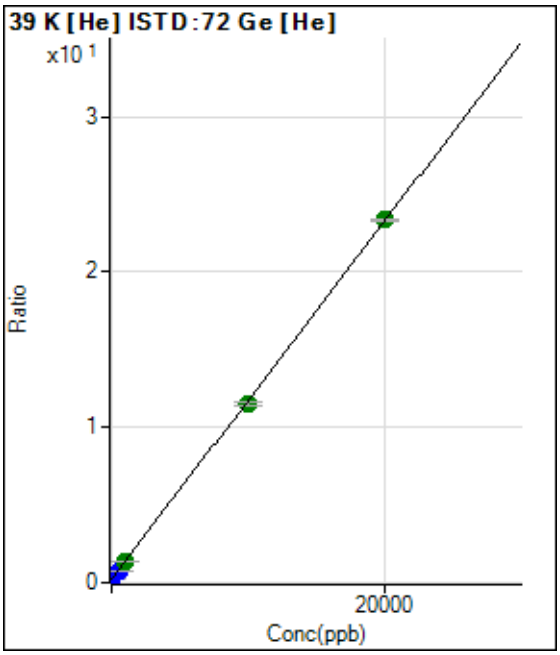
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	335760.93	0.1608	P	0.4
2	☐	10.000	14.203	416738.94	0.2012	P	10.1
3	☐	25.000	25.469	485684.00	0.2333	P	1.6
4	☐	50.000	51.851	634486.90	0.3085	P	2.2
5	☐	500.000	504.670	3229488.49	1.5990	A	2.2
6	☐	1000.000	997.519	5949471.37	3.0035	A	1.1

y = 0.0028 * x + 0.1608
R = 1.0000
DL = 0.7413
BEC = 56.41

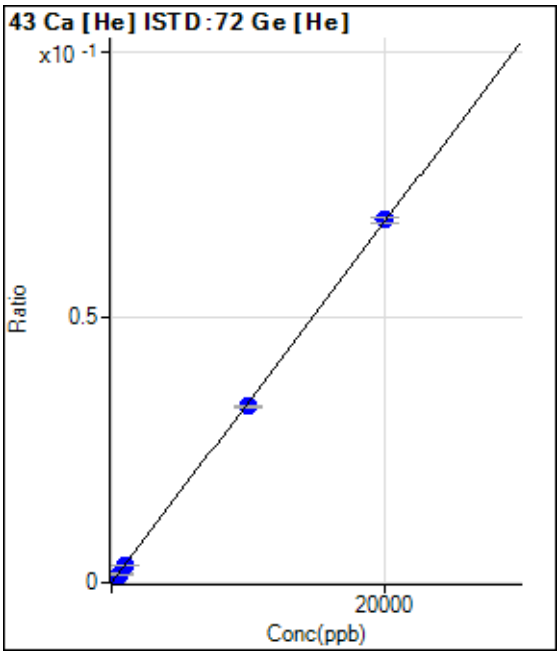
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	161478.41	0.2263	P	1.1
2	☐	200.000	192.427	318483.73	0.4481	P	0.6
3	☐	500.000	492.282	564567.52	0.7935	P	0.2
4	☐	1000.000	1017.715	991593.60	1.3989	A	2.6
5	☐	10000.00	9835.836	8109321.34	11.5592	A	2.4
6	☐	20000.00	20081.46	15915292.68	23.3642	A	0.7

y = 0.0012 * x + 0.2263
R = 1.0000
DL = 6.642
BEC = 196.4

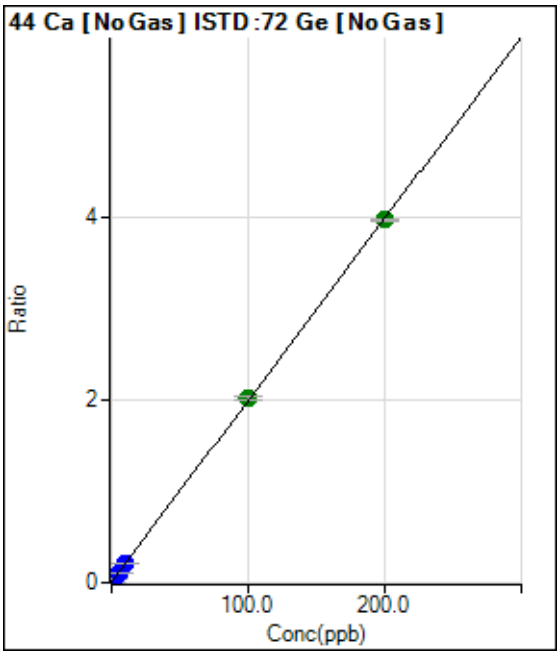
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	30.00	0.0000	P	87.9
2	☐	200.000	187.820	483.35	0.0007	P	14.1
3	☐	500.000	438.611	1090.06	0.0015	P	15.9
4	☐	1000.000	952.504	2323.57	0.0033	P	2.1
5	☐	10000.00	9778.968	23336.73	0.0333	P	0.7
6	☐	20000.00	20114.54	46575.62	0.0684	P	1.9

y = 3.3973E-006 * x + 4.1913E-005
R = 0.9999
DL = 32.53
BEC = 12.34

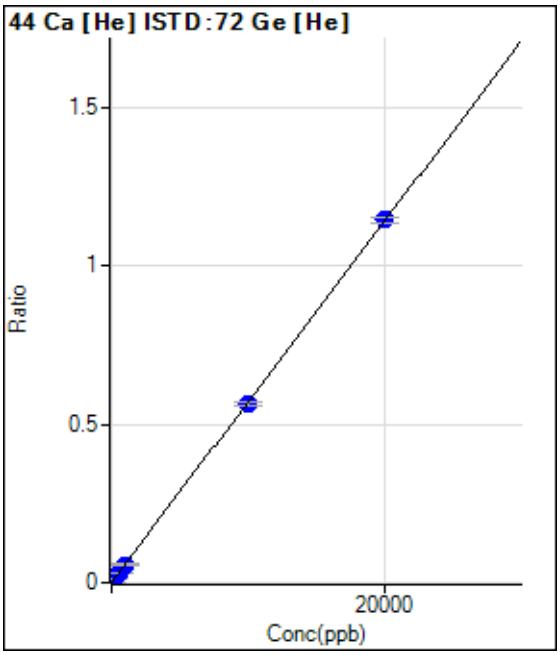
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	14247.65	0.0068	P	1.2
2	☐	2.000	1.974	95264.75	0.0460	P	0.2
3	☐	5.000	4.891	216184.86	0.1039	P	1.3
4	☐	10.000	10.093	425802.01	0.2071	P	2.8
5	☐	100.000	101.219	4069402.54	2.0151	A	2.5
6	☐	200.000	199.389	7850137.80	3.9629	A	0.7

y = 0.0198 * x + 0.0068
R = 1.0000
DL = 0.01238
BEC = 0.3438

Weight: <None>
Min Conc: <None>

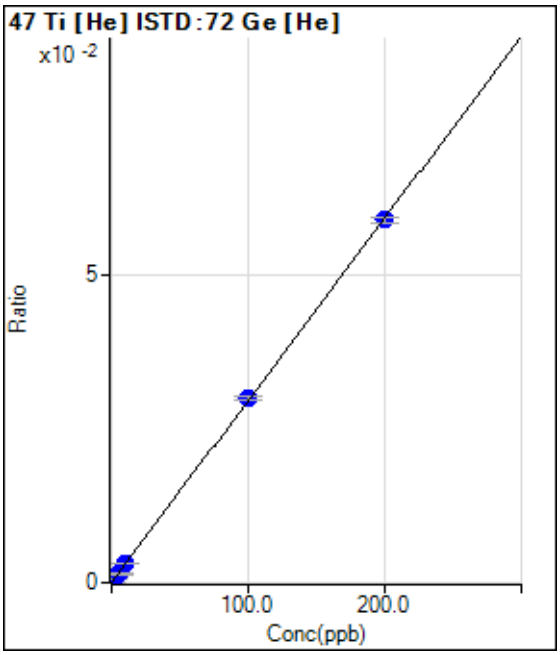


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	560.02	0.0008	P	10.5
2	☐	200.000	192.717	8376.01	0.0118	P	4.9
3	☐	500.000	484.923	20248.53	0.0285	P	1.9
4	☐	1000.000	996.662	40877.63	0.0577	P	1.9
5	☐	10000.00	9845.486	394749.10	0.5627	P	2.2
6	☐	20000.00	20077.87	781055.22	1.1466	P	1.8

y = 5.7070E-005 * x + 7.8454E-004
R = 1.0000
DL = 4.311
BEC = 13.75

Weight: <None>
Min Conc: <None>

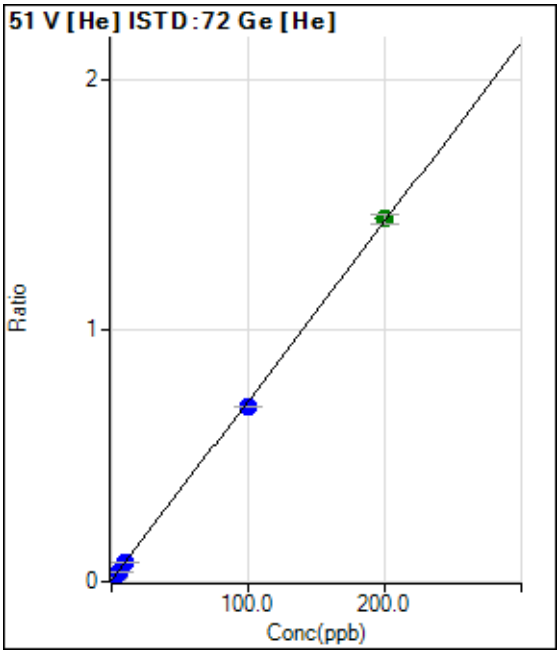
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	20.00	0.0000	P	49.4
2	☐	2.000	1.758	390.01	0.0005	P	4.6
3	☐	5.000	4.757	1023.39	0.0014	P	16.8
4	☐	10.000	10.189	2160.21	0.0030	P	3.5
5	☐	100.000	101.511	21119.90	0.0301	P	1.4
6	☐	200.000	199.244	40232.56	0.0591	P	1.6

y = 2.9629E-004 * x + 2.7953E-005
R = 1.0000
DL = 0.1398
BEC = 0.09434

Weight: <None>
Min Conc: <None>

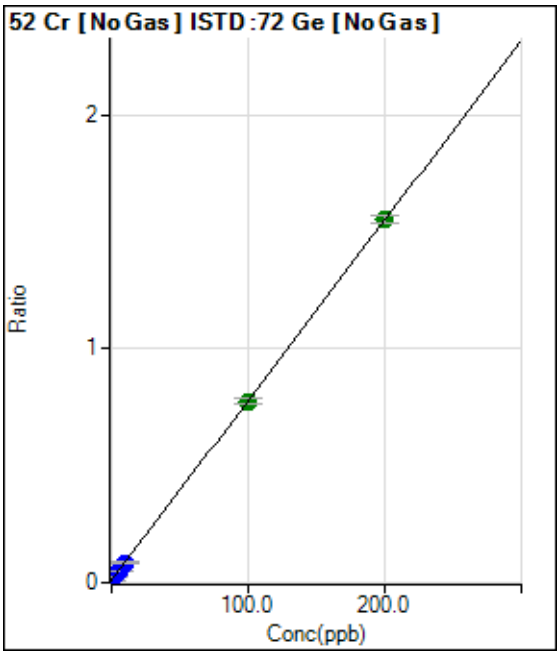


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	3837.23	0.0054	P	2.1
2	☐	2.000	1.878	13352.10	0.0188	P	1.8
3	☐	5.000	4.732	27860.49	0.0392	P	0.5
4	☐	10.000	9.702	52911.59	0.0747	P	2.8
5	☐	100.000	96.952	489413.71	0.6976	P	0.8
6	☐	200.000	201.547	983895.48	1.4444	A	2.5

y = 0.0071 * x + 0.0054
R = 0.9998
DL = 0.047
BEC = 0.7532

Weight: <None>
Min Conc: <None>

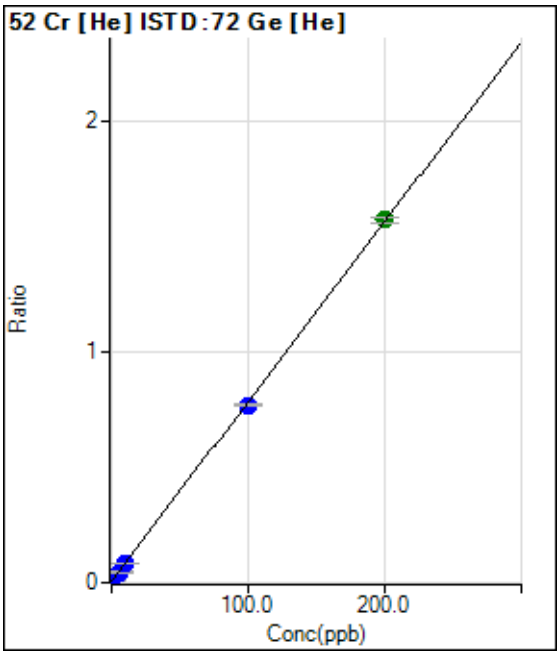
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	20886.36	0.0100	P	2.3
2	☐	2.000	1.938	51590.44	0.0249	P	1.6
3	☐	5.000	4.830	98103.02	0.0471	P	1.4
4	☐	10.000	9.859	176394.34	0.0858	P	3.1
5	☐	100.000	99.405	1563227.69	0.7742	A	2.9
6	☐	200.000	200.309	3069983.18	1.5499	A	2.0

y = 0.0077 * x + 0.0100
R = 1.0000
DL = 0.08963
BEC = 1.301

Weight: <None>
Min Conc: <None>

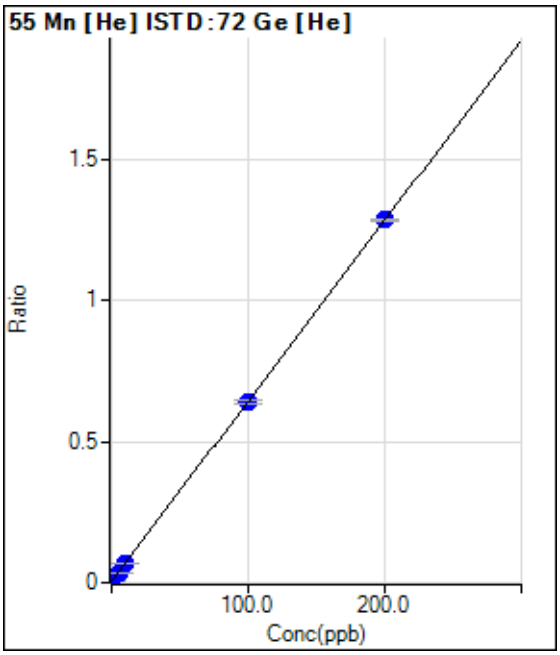


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4730.91	0.0066	P	3.9
2	☐	2.000	1.908	15282.05	0.0215	P	1.8
3	☐	5.000	4.957	32214.86	0.0453	P	3.8
4	☐	10.000	9.801	58866.59	0.0830	P	1.6
5	☐	100.000	97.740	539172.58	0.7685	P	1.1
6	☐	200.000	201.142	1072552.98	1.5746	A	1.8

y = 0.0078 * x + 0.0066
R = 0.9999
DL = 0.1
BEC = 0.8504

Weight: <None>
Min Conc: <None>

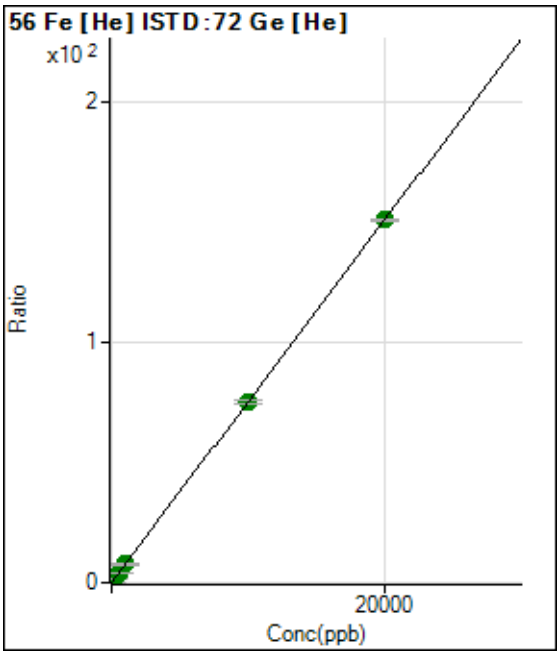
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4043.99	0.0057	P	7.6
2	☐	2.000	1.862	12499.26	0.0176	P	0.5
3	☐	5.000	4.815	25948.29	0.0365	P	3.1
4	☐	10.000	10.061	49653.78	0.0700	P	1.3
5	☐	100.000	99.283	449656.36	0.6409	P	1.8
6	☐	200.000	200.362	877161.71	1.2877	P	0.8

y = 0.0064 * x + 0.0057
R = 1.0000
DL = 0.202
BEC = 0.8862

Weight: <None>
Min Conc: <None>

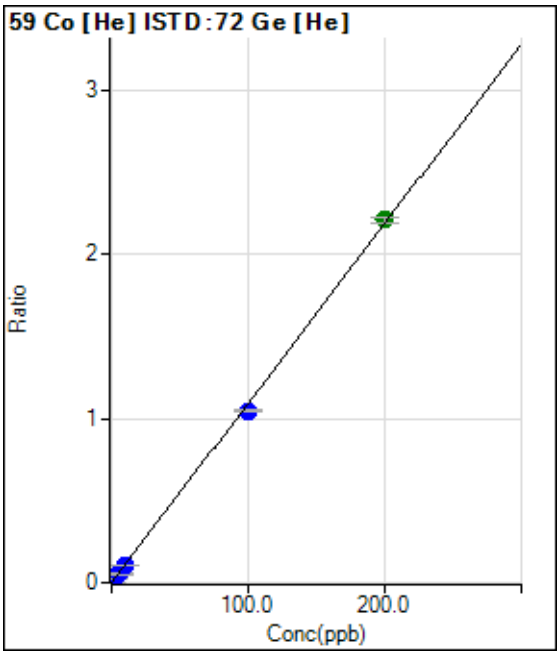


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	14911.86	0.0209	P	6.3
2	☐	200.000	200.335	1089655.56	1.5329	A	1.2
3	☐	500.000	507.947	2742459.02	3.8546	A	2.2
4	☐	1000.000	1012.551	5431625.55	7.6631	A	2.4
5	☐	10000.00	9952.420	52712055.88	75.1364	A	1.8
6	☐	20000.00	20022.96	102958401.8	151.143	A	0.6

y = 0.0075 * x + 0.0209
R = 1.0000
DL = 0.5227
BEC = 2.77

Weight: <None>
Min Conc: <None>

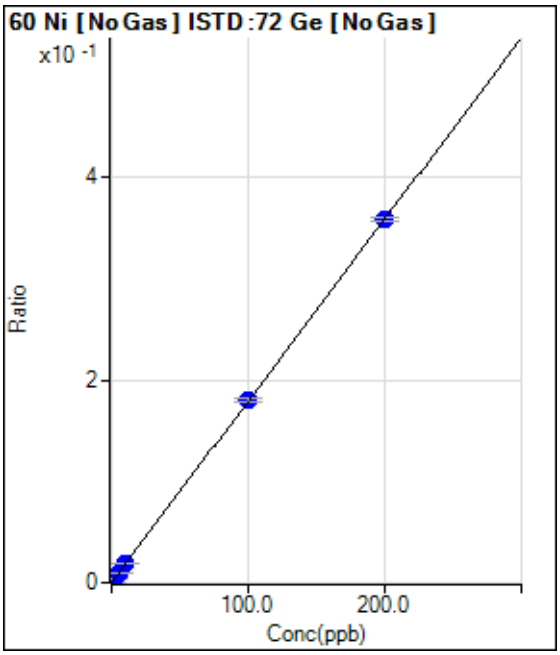
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	63.33	0.0001	P	23.4
2	☐	2.000	1.894	14778.30	0.0208	P	4.3
3	☐	5.000	4.863	37866.24	0.0532	P	3.1
4	☐	10.000	9.595	74392.71	0.1049	P	0.9
5	☐	100.000	95.672	733518.79	1.0456	P	1.5
6	☐	200.000	202.189	1505152.16	2.2095	A	1.4

y = 0.0109 * x + 8.8662E-005
R = 0.9997
DL = 0.005694
BEC = 0.008114

Weight: <None>
Min Conc: <None>

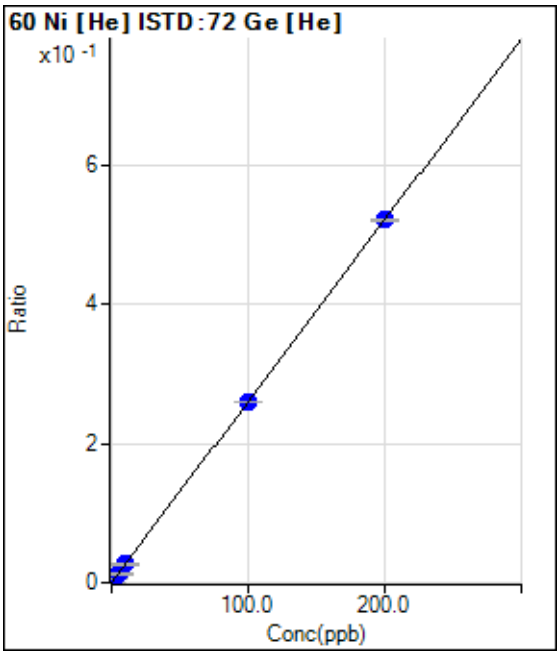


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	310.01	0.0001	P	17.0
2	☐	2.000	1.970	7615.63	0.0037	P	4.0
3	☐	5.000	4.959	18786.48	0.0090	P	4.4
4	☐	10.000	10.163	37735.87	0.0183	P	1.3
5	☐	100.000	100.402	363374.37	0.1799	P	2.3
6	☐	200.000	199.792	708991.06	0.3579	P	0.9

y = 0.0018 * x + 1.4842E-004
R = 1.0000
DL = 0.04232
BEC = 0.08288

Weight: <None>
Min Conc: <None>

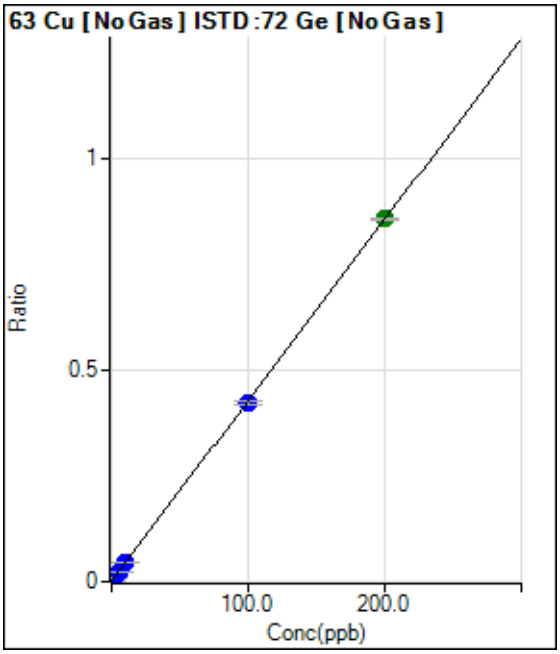
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	116.67	0.0002	P	35.0
2	☐	2.000	1.848	3530.53	0.0050	P	3.1
3	☐	5.000	4.730	8863.04	0.0125	P	3.6
4	☐	10.000	10.021	18586.27	0.0262	P	2.1
5	☐	100.000	99.617	181814.79	0.2592	P	0.2
6	☐	200.000	200.199	354657.56	0.5206	P	0.7

y = 0.0026 * x + 1.6318E-004
R = 1.0000
DL = 0.06599
BEC = 0.06276

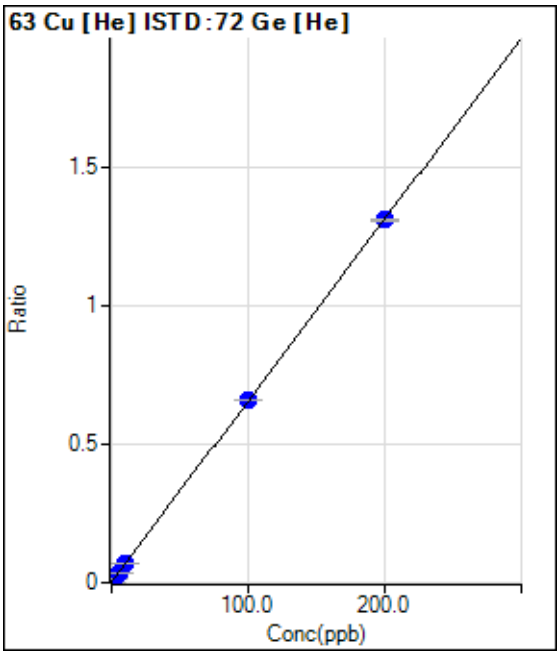
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2893.70	0.0014	P	5.4
2	☐	2.000	1.966	20302.08	0.0098	P	0.5
3	☐	5.000	5.039	47774.00	0.0230	P	1.5
4	☐	10.000	10.072	91462.82	0.0445	P	4.5
5	☐	100.000	99.090	859184.26	0.4255	P	2.2
6	☐	200.000	200.451	1702139.25	0.8592	A	0.7

y = 0.0043 * x + 0.0014
R = 1.0000
DL = 0.05242
BEC = 0.3238

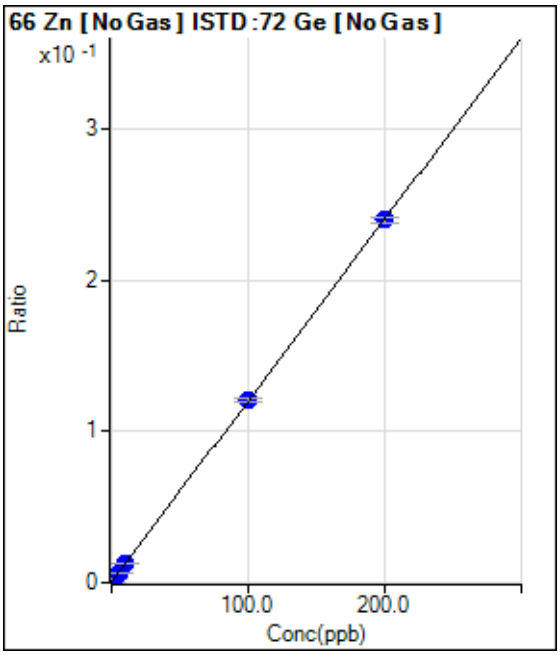
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1463.45	0.0021	P	12.4
2	☐	2.000	1.956	10570.96	0.0149	P	1.5
3	☐	5.000	4.949	24532.43	0.0345	P	2.6
4	☐	10.000	9.984	47841.08	0.0675	P	0.5
5	☐	100.000	100.444	463315.92	0.6604	P	0.7
6	☐	200.000	199.780	893359.00	1.3115	P	0.6

y = 0.0066 * x + 0.0021
R = 1.0000
DL = 0.1168
BEC = 0.3128

Weight: <None>
Min Conc: <None>

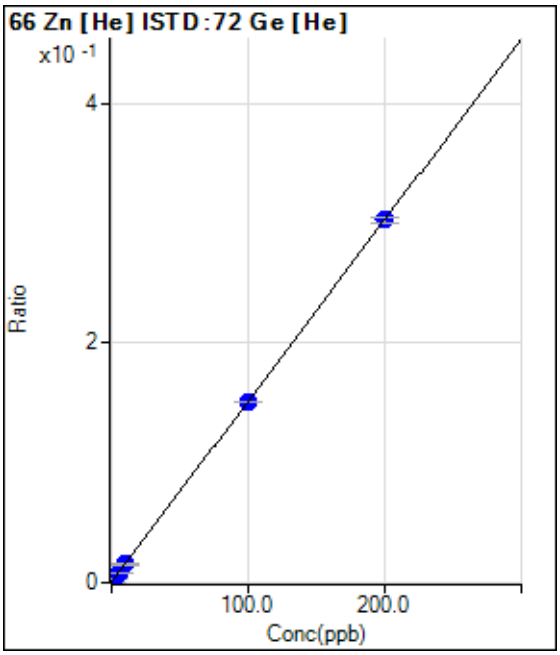


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	636.69	0.0003	P	14.1
2	☐	2.000	2.009	5631.27	0.0027	P	2.2
3	☐	5.000	4.926	12949.77	0.0062	P	3.6
4	☐	10.000	10.171	25758.08	0.0125	P	0.9
5	☐	100.000	100.377	244131.66	0.1209	P	1.6
6	☐	200.000	199.805	476020.83	0.2403	P	1.4

y = 0.0012 * x + 3.0487E-004
R = 1.0000
DL = 0.1077
BEC = 0.2538

Weight: <None>
Min Conc: <None>

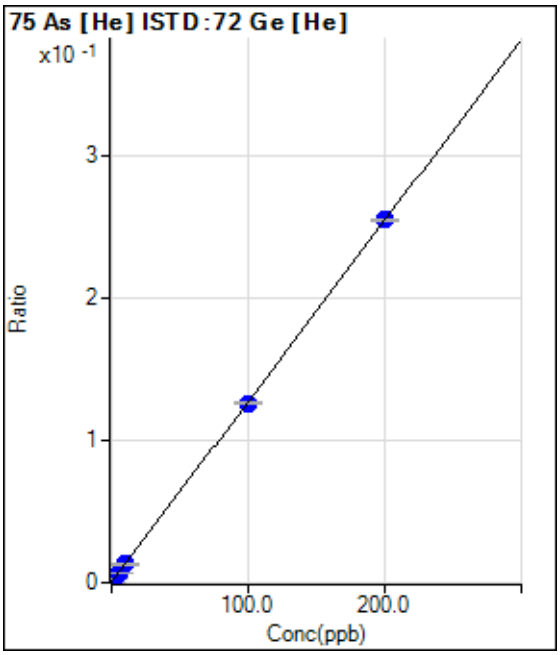
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	253.34	0.0004	P	15.4
2	☐	2.000	2.001	2403.59	0.0034	P	2.8
3	☐	5.000	4.760	5374.49	0.0076	P	1.9
4	☐	10.000	9.927	10894.54	0.0154	P	3.9
5	☐	100.000	99.744	106075.82	0.1512	P	0.5
6	☐	200.000	200.138	206409.59	0.3030	P	1.8

y = 0.0015 * x + 3.5490E-004
R = 1.0000
DL = 0.1083
BEC = 0.2347

Weight: <None>
Min Conc: <None>

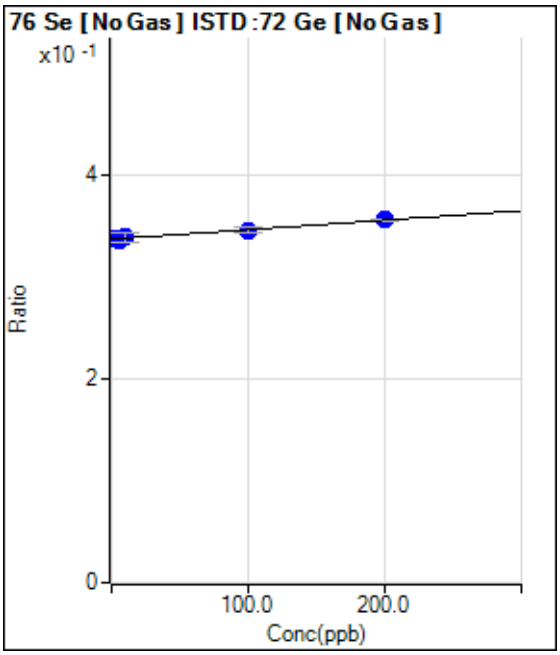


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	216.67	0.0003	P	6.5
2	☐	2.000	2.004	2024.61	0.0028	P	1.2
3	☐	5.000	4.871	4615.26	0.0065	P	3.3
4	☐	10.000	9.901	9124.24	0.0129	P	3.2
5	☐	100.000	99.077	88457.46	0.1261	P	1.0
6	☐	200.000	200.470	173569.71	0.2548	P	0.7

y = 0.0013 * x + 3.0380E-004
R = 1.0000
DL = 0.04665
BEC = 0.2393

Weight: <None>
Min Conc: <None>

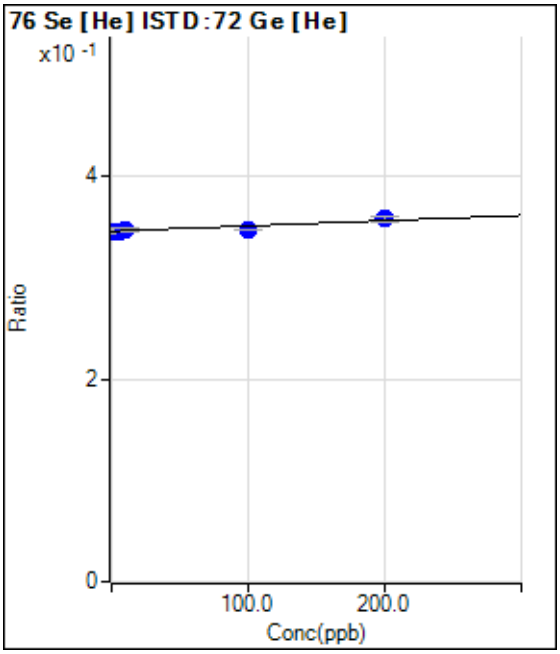
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	702503.12	0.3364	P	0.9
2	☐	2.000	7.485	698254.83	0.3371	P	0.1
3	☐	5.000	-17.753	696702.73	0.3347	P	0.9
4	☐	10.000	19.821	695467.54	0.3382	P	2.8
5	☐	100.000	95.981	697355.95	0.3453	P	2.1
6	☐	200.000	202.033	703595.72	0.3552	P	0.9

y = 9.3189E-005 * x + 0.3364
R = 0.9908
DL = 96.95
BEC = 3610

Weight: <None>
Min Conc: <None>

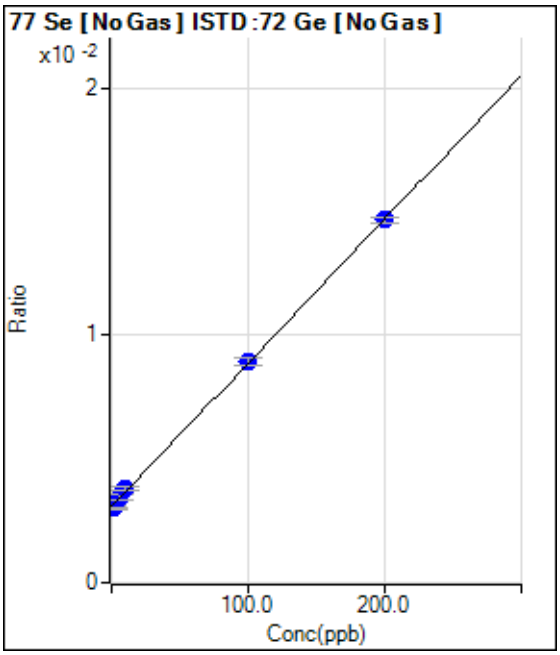


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	246910.93	0.3461	P	0.1
2	☐	2.000	-2.650	245896.80	0.3459	P	1.5
3	☐	5.000	-2.487	246107.47	0.3459	P	1.0
4	☐	10.000	33.619	246553.04	0.3478	P	1.0
5	☐	100.000	35.658	244088.77	0.3479	P	0.2
6	☐	200.000	231.224	243913.92	0.3581	P	1.3

y = 5.1926E-005 * x + 0.3461
R = 0.9294
DL = 10.09
BEC = 6665

Weight: <None>
Min Conc: <None>

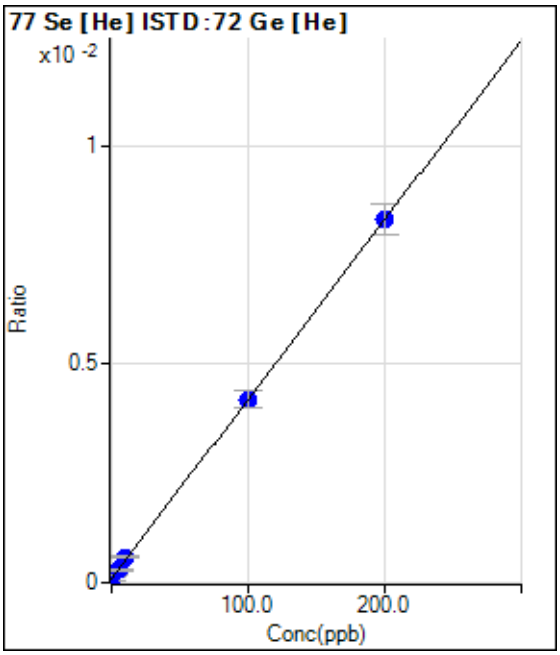
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	6414.99	0.0031	P	3.1
2	☐	2.000	-1.337	6201.53	0.0030	P	1.3
3	☐	5.000	6.296	7152.02	0.0034	P	7.5
4	☐	10.000	12.441	7802.44	0.0038	P	4.1
5	☐	100.000	100.871	18039.03	0.0089	P	4.2
6	☐	200.000	199.443	29051.79	0.0147	P	1.7

y = 5.8138E-005 * x + 0.0031
R = 0.9997
DL = 4.976
BEC = 52.83

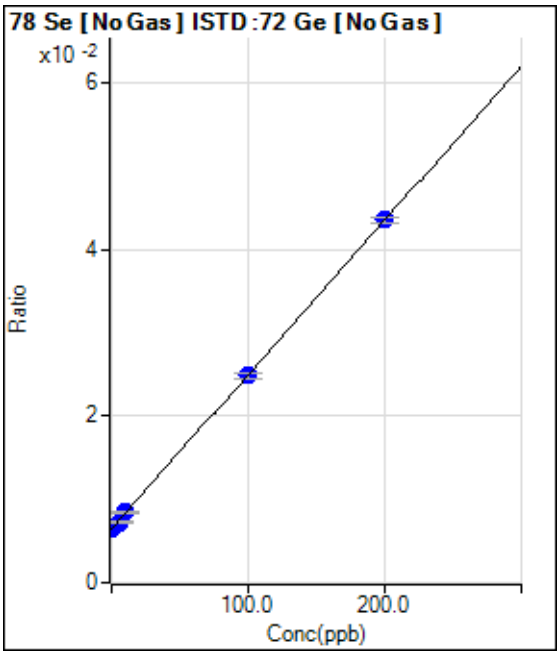
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	66.67	0.0001	P	83.6
2	☐	2.000	2.965	153.34	0.0002	P	29.3
3	☐	5.000	4.788	206.67	0.0003	P	19.7
4	☐	10.000	12.033	416.68	0.0006	P	6.0
5	☐	100.000	99.781	2940.39	0.0042	P	9.2
6	☐	200.000	200.004	5657.96	0.0083	P	8.3

y = 4.1062E-005 * x + 9.3930E-005
R = 0.9999
DL = 5.734
BEC = 2.288

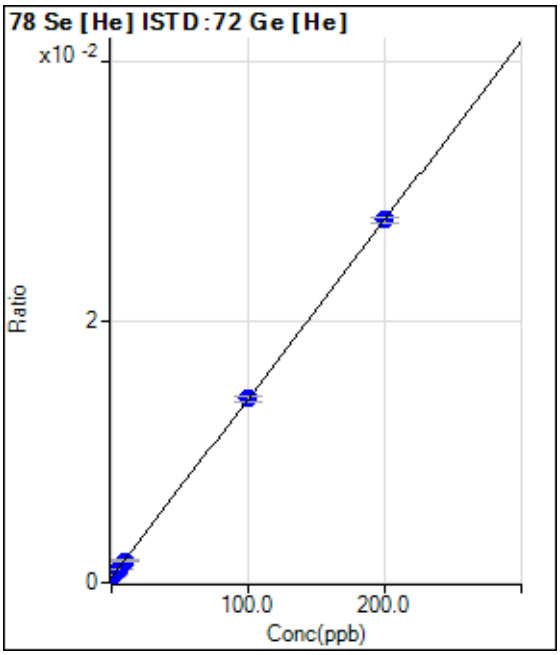
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	13533.68	0.0065	P	1.7
2	☐	2.000	1.511	14004.13	0.0068	P	2.5
3	☐	5.000	4.180	15102.00	0.0073	P	3.1
4	☐	10.000	10.557	17351.50	0.0084	P	1.9
5	☐	100.000	99.431	50247.17	0.0249	P	2.5
6	☐	200.000	200.282	86261.74	0.0435	P	1.3

y = 1.8508E-004 * x + 0.0065
R = 1.0000
DL = 1.764
BEC = 35.01

Weight: <None>
Min Conc: <None>

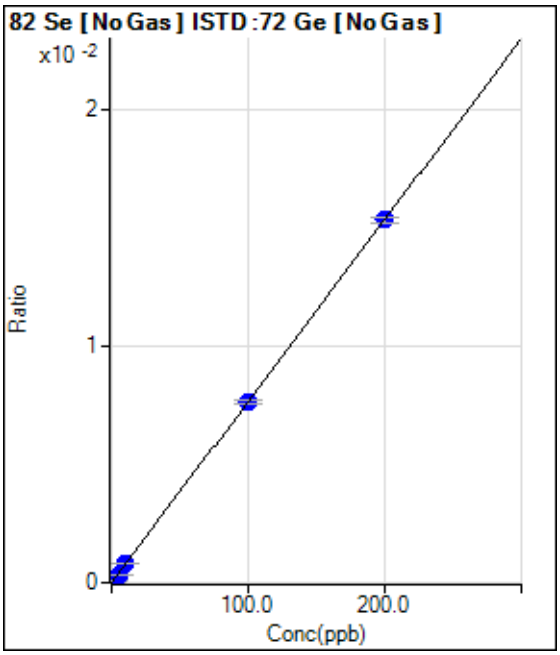


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	274.00	0.0004	P	6.8
2	☐	2.000	1.677	436.68	0.0006	P	8.3
3	☐	5.000	4.798	741.35	0.0010	P	5.2
4	☐	10.000	9.535	1199.39	0.0017	P	0.8
5	☐	100.000	99.900	9882.31	0.0141	P	2.1
6	☐	200.000	200.082	18955.96	0.0278	P	1.7

y = 1.3716E-004 * x + 3.8419E-004
R = 1.0000
DL = 0.5681
BEC = 2.801

Weight: <None>
Min Conc: <None>

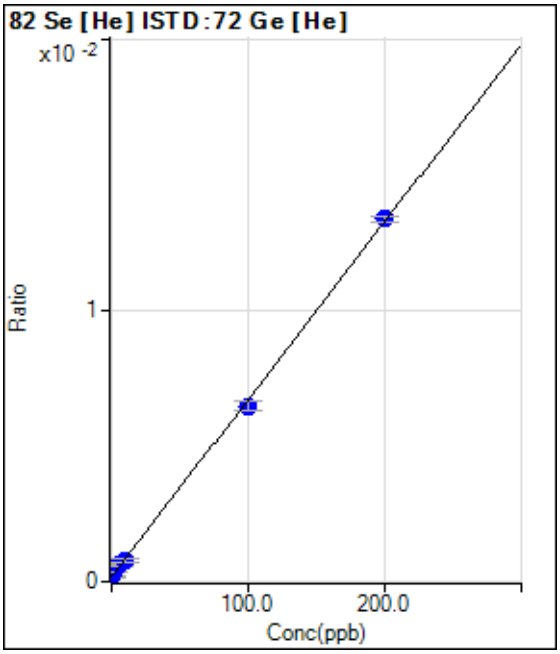
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	-28.74	0.0000	P	-256.6
2	☐	2.000	1.596	224.17	0.0001	P	54.8
3	☐	5.000	4.351	664.54	0.0003	P	5.2
4	☐	10.000	10.770	1668.89	0.0008	P	4.2
5	☐	100.000	99.703	15391.26	0.0076	P	2.5
6	☐	200.000	200.130	30327.22	0.0153	P	1.7

y = 7.6566E-005 * x - 1.3891E-005
R = 1.0000
DL = 1.397
BEC = -0.1814

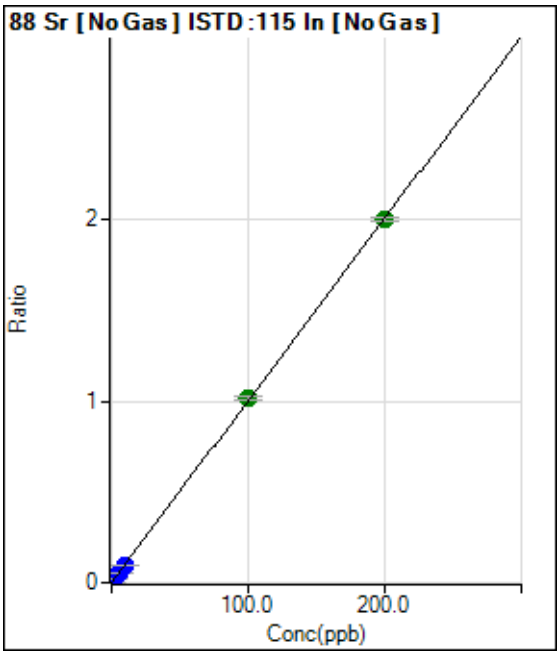
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	126.67	0.0002	P	12.1
2	☐	2.000	2.663	250.01	0.0004	P	14.4
3	☐	5.000	6.672	436.68	0.0006	P	5.0
4	☐	10.000	8.860	536.69	0.0008	P	18.1
5	☐	100.000	96.418	4547.52	0.0065	P	4.6
6	☐	200.000	201.800	9109.92	0.0134	P	1.9

y = 6.5392E-005 * x + 1.7756E-004
R = 0.9997
DL = 0.9884
BEC = 2.715

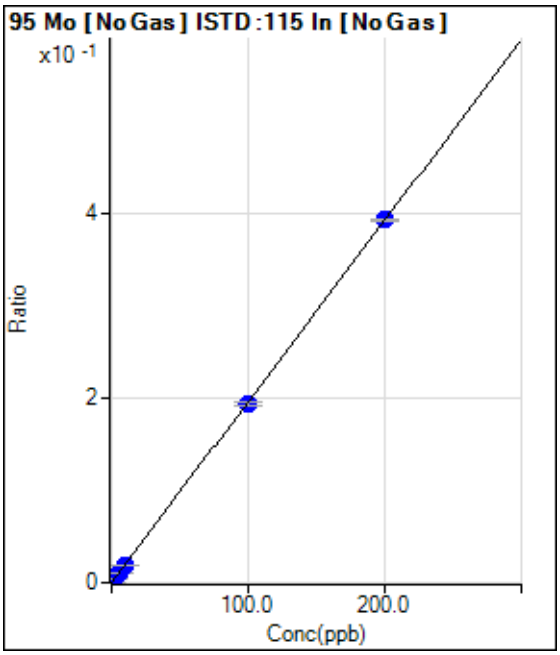
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1140.07	0.0005	P	3.4
2	☐	2.000	1.905	46918.98	0.0196	P	2.6
3	☐	5.000	4.898	119046.74	0.0496	P	0.3
4	☐	10.000	9.739	238649.35	0.0981	P	1.6
5	☐	100.000	101.401	2390961.22	1.0165	A	1.1
6	☐	200.000	199.316	4613811.91	1.9976	A	1.1

y = 0.0100 * x + 4.8415E-004
R = 1.0000
DL = 0.004905
BEC = 0.04832

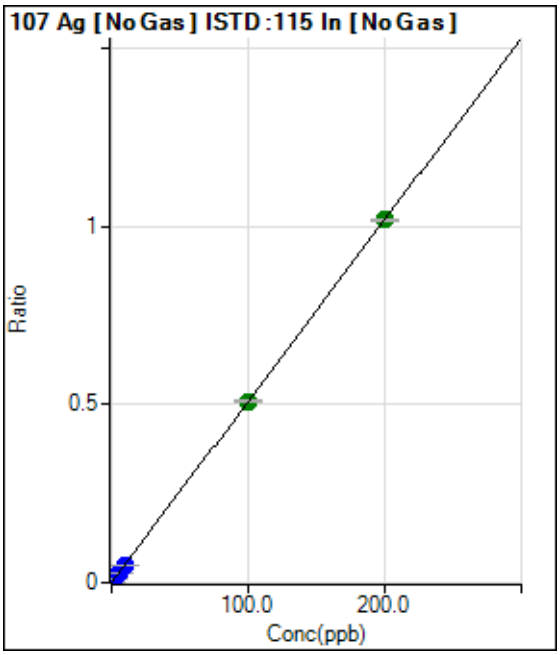
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	60.00	0.0000	P	33.6
2	☐	2.000	1.924	9129.97	0.0038	P	3.1
3	☐	5.000	4.902	23207.23	0.0097	P	3.2
4	☐	10.000	9.760	46748.81	0.0192	P	1.9
5	☐	100.000	99.110	458324.74	0.1948	P	1.9
6	☐	200.000	200.460	910125.01	0.3941	P	0.5

y = 0.0020 * x + 2.5474E-005
R = 1.0000
DL = 0.01306
BEC = 0.01296

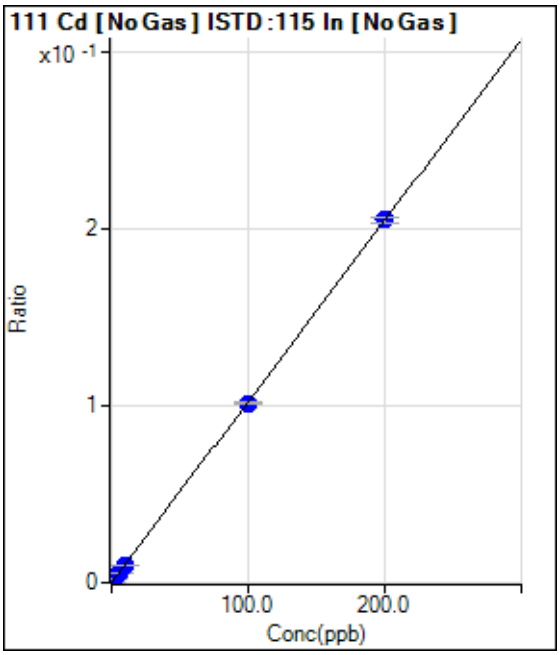
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	303.34	0.0001	P	25.3
2	☐	2.000	1.879	23264.18	0.0097	P	1.9
3	☐	5.000	4.785	58874.37	0.0245	P	0.2
4	☐	10.000	9.694	120532.21	0.0495	P	2.4
5	☐	100.000	99.941	1198411.10	0.5095	A	1.2
6	☐	200.000	200.051	2354936.48	1.0196	A	0.8

y = 0.0051 * x + 1.2851E-004
R = 1.0000
DL = 0.01913
BEC = 0.02522

Weight: <None>
Min Conc: <None>

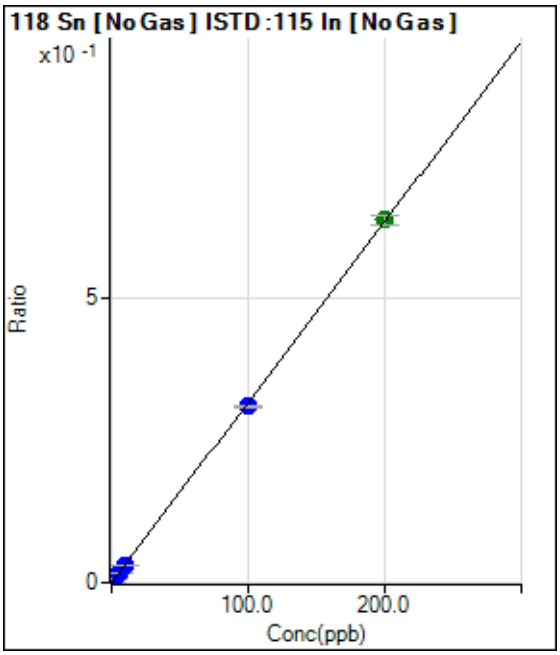


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	23.33	0.0000	P	108.7
2	☐	2.000	1.910	4710.93	0.0020	P	6.3
3	☐	5.000	4.948	12192.52	0.0051	P	2.9
4	☐	10.000	9.899	24693.49	0.0101	P	2.2
5	☐	100.000	99.194	238966.40	0.1016	P	0.8
6	☐	200.000	200.410	473997.53	0.2052	P	1.9

y = 0.0010 * x + 9.9156E-006
R = 1.0000
DL = 0.03157
BEC = 0.009683

Weight: <None>
Min Conc: <None>

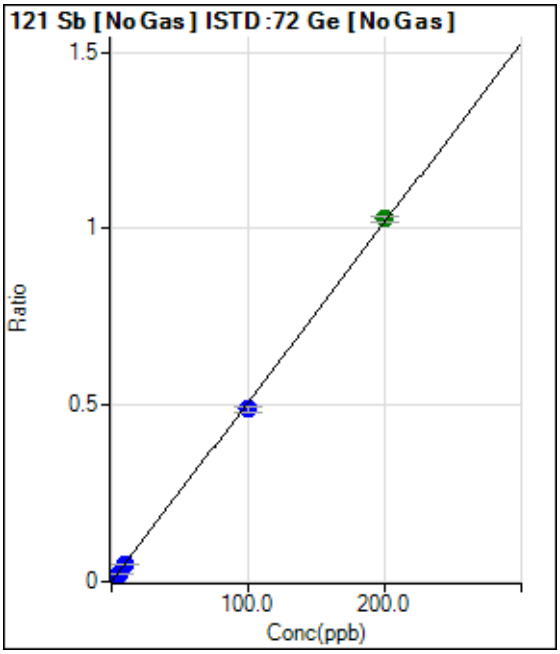
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1243.42	0.0005	P	8.3
2	☐	2.000	1.919	15803.17	0.0066	P	4.4
3	☐	5.000	4.751	37343.46	0.0155	P	3.0
4	☐	10.000	9.607	75201.72	0.0309	P	0.8
5	☐	100.000	97.711	727912.02	0.3094	P	1.0
6	☐	200.000	201.171	1469992.90	0.6365	A	2.6

y = 0.0032 * x + 5.2762E-004
R = 0.9999
DL = 0.04158
BEC = 0.1669

Weight: <None>
Min Conc: <None>

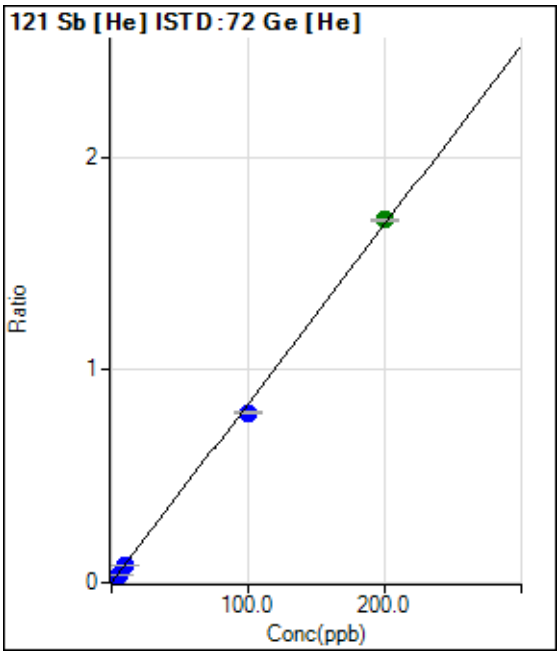


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	336.68	0.0002	P	2.9
2	☐	2.000	1.756	18837.10	0.0091	P	0.9
3	☐	5.000	4.401	46930.76	0.0225	P	0.5
4	☐	10.000	9.476	99455.02	0.0484	P	2.3
5	☐	100.000	96.006	986444.80	0.4885	P	2.9
6	☐	200.000	202.041	2036073.25	1.0279	A	1.2

y = 0.0051 * x + 1.6119E-004
R = 0.9997
DL = 0.002784
BEC = 0.03169

Weight: <None>
Min Conc: <None>

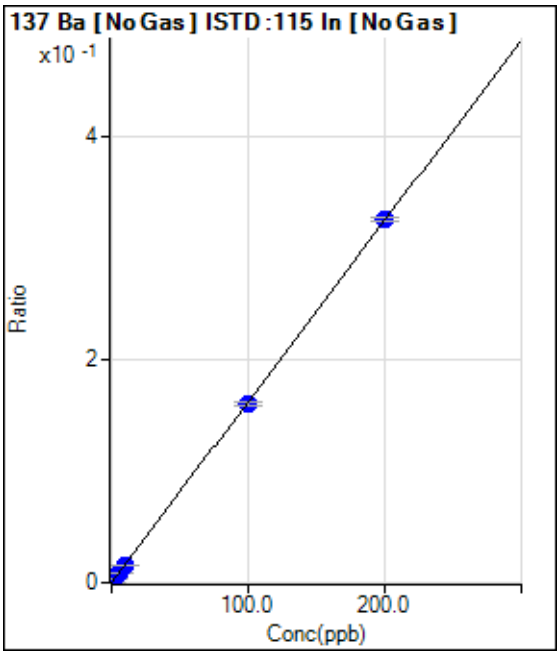
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	210.01	0.0003	P	16.1
2	☐	2.000	1.728	10547.70	0.0148	P	2.8
3	☐	5.000	4.578	27616.02	0.0388	P	3.5
4	☐	10.000	9.215	55179.50	0.0778	P	1.2
5	☐	100.000	94.956	560869.93	0.7994	P	0.4
6	☐	200.000	202.575	1161532.75	1.7052	A	0.7

y = 0.0084 * x + 2.9423E-004
R = 0.9996
DL = 0.01687
BEC = 0.03496

Weight: <None>
Min Conc: <None>

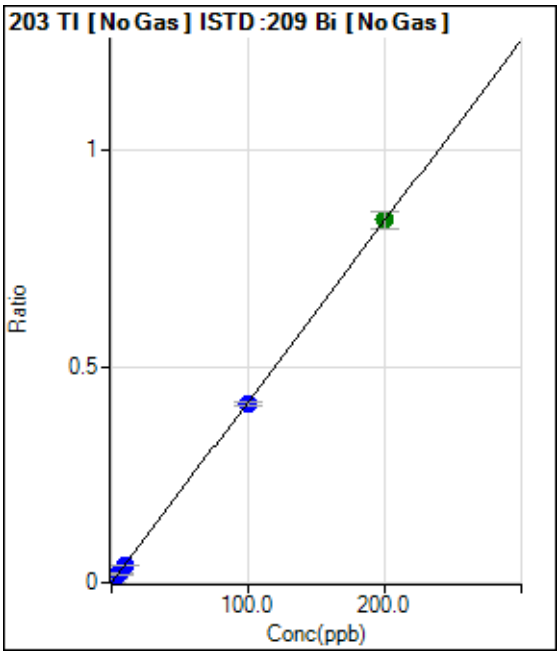


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	146.67	0.0001	P	28.5
2	☐	2.000	1.872	7425.58	0.0031	P	2.5
3	☐	5.000	4.925	19328.11	0.0080	P	3.9
4	☐	10.000	9.703	38427.37	0.0158	P	3.9
5	☐	100.000	98.847	377122.10	0.1603	P	1.5
6	☐	200.000	200.595	751319.11	0.3253	P	1.1

y = 0.0016 * x + 6.2394E-005
R = 1.0000
DL = 0.03289
BEC = 0.03848

Weight: <None>
Min Conc: <None>

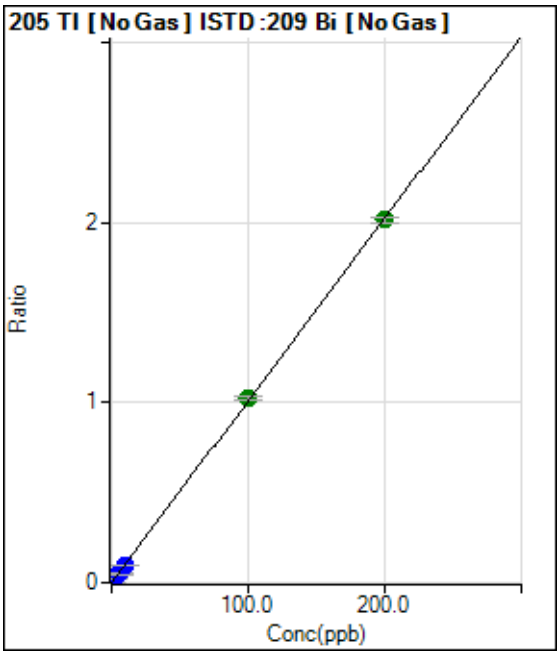
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	76.67	0.0000	P	35.3
2	☐	2.000	1.847	16227.49	0.0078	P	2.8
3	☐	5.000	4.830	42204.85	0.0203	P	2.6
4	☐	10.000	9.745	86495.62	0.0408	P	2.2
5	☐	100.000	98.876	858291.24	0.4141	P	1.3
6	☐	200.000	200.581	1728079.09	0.8400	A	4.6

y = 0.0042 * x + 3.6840E-005
R = 1.0000
DL = 0.009313
BEC = 0.008798

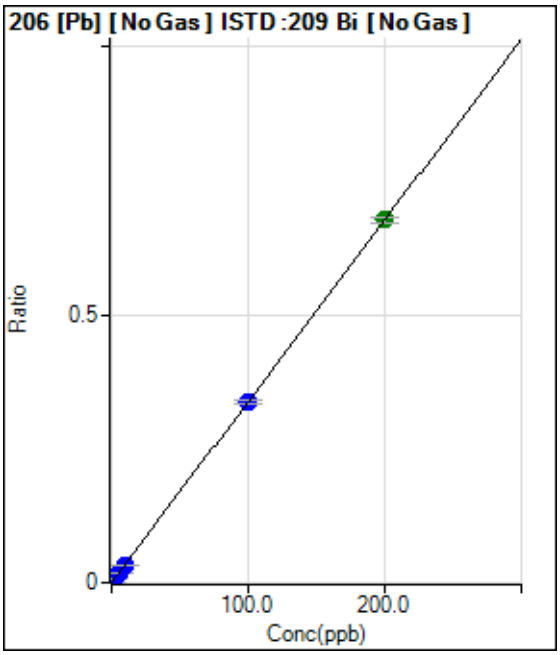
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	226.67	0.0001	P	22.7
2	☐	2.000	1.847	39208.63	0.0188	P	2.8
3	☐	5.000	4.818	101591.22	0.0488	P	5.0
4	☐	10.000	9.589	205409.70	0.0970	P	2.5
5	☐	100.000	101.287	2121323.25	1.0236	A	2.4
6	☐	200.000	199.383	4146407.65	2.0148	A	1.6

y = 0.0101 * x + 1.0909E-004
R = 1.0000
DL = 0.007359
BEC = 0.0108

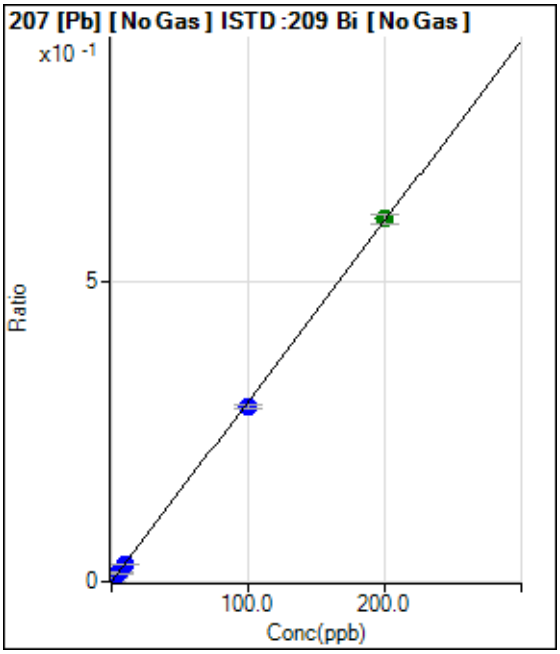
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	250.01	0.0001	P	5.8
2	☐	2.000	1.950	14018.09	0.0067	P	3.1
3	☐	5.000	4.897	34715.39	0.0167	P	3.6
4	☐	10.000	9.847	70730.47	0.0334	P	2.8
5	☐	100.000	99.398	696515.09	0.3361	P	1.9
6	☐	200.000	200.312	1393526.70	0.6771	A	1.4

y = 0.0034 * x + 1.2063E-004
R = 1.0000
DL = 0.006175
BEC = 0.03569

Weight: <None>
Min Conc: <None>

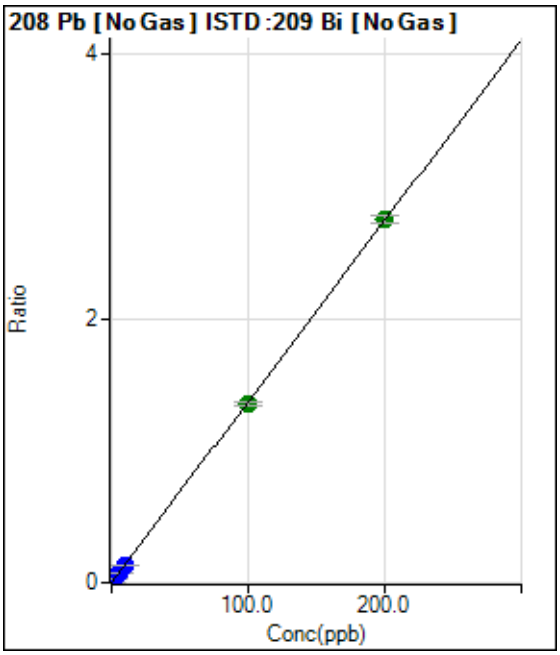


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	306.68	0.0001	P	19.4
2	☐	2.000	1.826	11755.75	0.0056	P	2.5
3	☐	5.000	4.812	30387.45	0.0146	P	2.7
4	☐	10.000	9.523	60838.47	0.0287	P	2.6
5	☐	100.000	97.532	607046.46	0.2929	P	2.2
6	☐	200.000	201.264	1243347.79	0.6042	A	2.5

y = 0.0030 * x + 1.4803E-004
R = 0.9999
DL = 0.02865
BEC = 0.04932

Weight: <None>
Min Conc: <None>

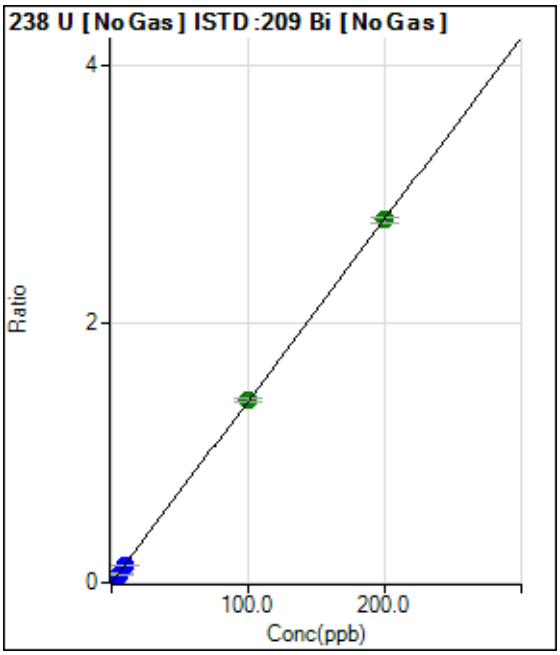
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1163.38	0.0006	P	3.8
2	☐	2.000	1.872	54757.91	0.0262	P	1.3
3	☐	5.000	4.837	139182.79	0.0668	P	3.3
4	☐	10.000	9.710	282936.43	0.1336	P	2.3
5	☐	100.000	98.920	2810359.40	1.3559	A	1.8
6	☐	200.000	200.560	5656282.78	2.7486	A	2.2

y = 0.0137 * x + 5.6210E-004
R = 1.0000
DL = 0.004726
BEC = 0.04102

Weight: <None>
Min Conc: <None>

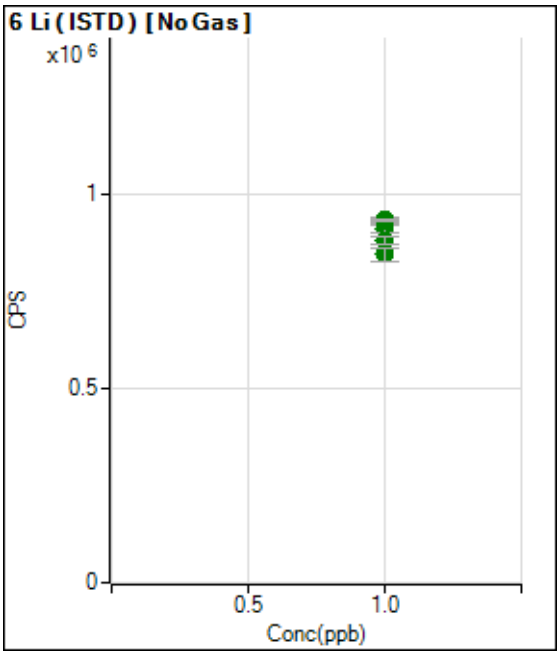


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	56.67	0.0000	P	68.7
2	☐	2.000	1.821	53467.02	0.0256	P	1.9
3	☐	5.000	4.691	137193.24	0.0659	P	4.6
4	☐	10.000	9.421	280152.63	0.1323	P	3.0
5	☐	100.000	100.641	2929770.58	1.4132	A	2.6
6	☐	200.000	199.718	5771433.25	2.8044	A	1.5

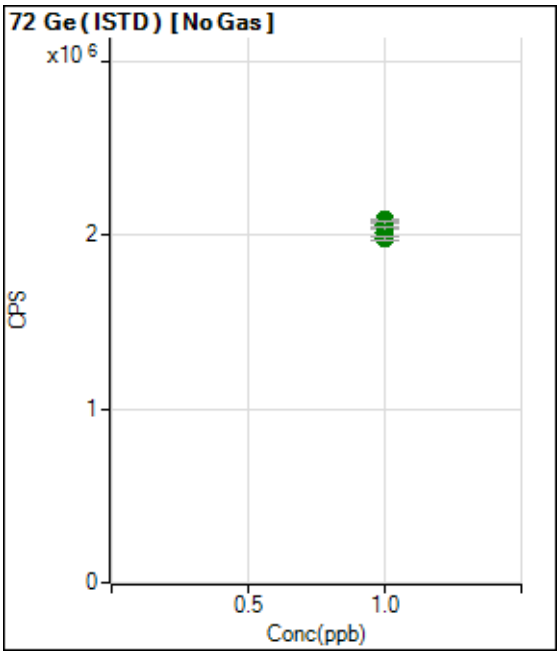
y = 0.0140 * x + 2.7612E-005
R = 1.0000
DL = 0.004052
BEC = 0.001966

Weight: <None>
Min Conc: <None>

Calibration for 015_ICV.d

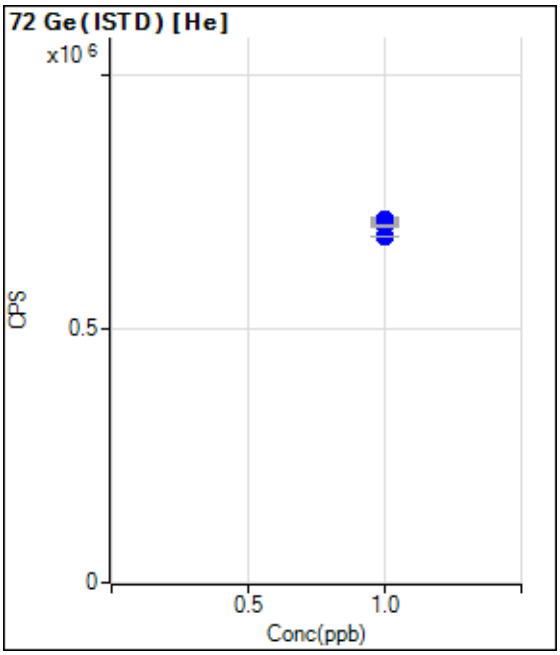


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		931764.05		A	1.9
2	☐	1.000		919641.37		A	0.7
3	☐	1.000		910315.15		A	2.7
4	☐	1.000		930654.78		A	0.3
5	☐	1.000		878633.32		A	1.9
6	☐	1.000		843606.75		A	4.3

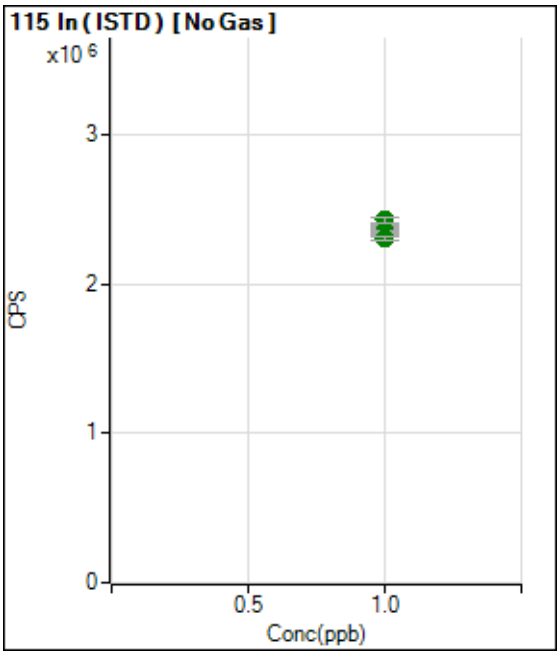


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2088541.12		A	0.6
2	☐	1.000		2071565.54		A	0.5
3	☐	1.000		2081608.46		A	1.1
4	☐	1.000		2057208.46		A	2.5
5	☐	1.000		2020187.21		A	2.5
6	☐	1.000		1980948.72		A	0.8

Calibration for 015_ICV.d

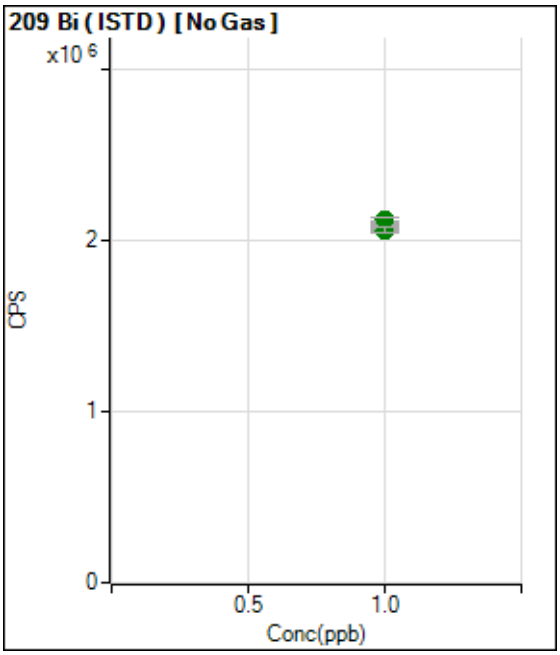


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		713484.34		P	0.9
2	☐	1.000		710825.67		P	0.2
3	☐	1.000		711451.11		P	0.7
4	☐	1.000		708905.59		P	1.0
5	☐	1.000		701575.93		P	0.4
6	☐	1.000		681191.37		P	0.3



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2355410.06		A	1.4
2	☐	1.000		2397214.76		A	0.7
3	☐	1.000		2401881.85		A	0.3
4	☐	1.000		2433841.52		A	1.4
5	☐	1.000		2352213.73		A	0.7
6	☐	1.000		2309617.41		A	0.7

Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2070771.43		A	2.3
2	☐	1.000		2088803.77		A	1.4
3	☐	1.000		2083659.50		A	2.8
4	☐	1.000		2118234.19		A	1.9
5	☐	1.000		2072859.66		A	1.1
6	☐	1.000		2058329.40		A	1.7

Calibration Blank Report

Sample Table

Sample Name	CAL BLK
Data File Name	008CALB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:06:53-06:00
Sample Type	CalBlk
Level	1
Dilution	1
Comment	

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Li	7	1	No Gas	58628	0.00
Be	9	1	No Gas	35	107.99
V	51	2	He	3837	0.06
Cr	52	2	He	4731	0.10
Fe	56	2	He	14912	0.04
Se	78	2	He	274	2.11
As	75	2	He	217	2.56
Ca	44	2	He	560	1.99
Na	23	2	He	118768	0.00
Mg	24	2	He	260	16.27
K	39	2	He	161478	0.00
Mn	55	2	He	4044	0.16
Co	59	2	He	63	38.08
Ni	60	2	He	117	30.59
Cu	63	2	He	1463	0.88
Zn	66	2	He	253	6.30
Al	27	2	He	1007	1.19
B	11	1	No Gas	15087	0.02
Al	27	1	No Gas	28717	0.01
Si	28	1	No Gas	335761	0.00
Ag	107	1	No Gas	303	8.78
Cd	111	1	No Gas	23	462.23
Sr	88	1	No Gas	1140	0.20
Mo	95	1	No Gas	60	55.56
Sn	118	1	No Gas	1243	0.75
Sb	121	1	No Gas	337	1.02
Ba	137	1	No Gas	147	18.79
Tl	205	1	No Gas	227	11.07
Tl	203	1	No Gas	77	49.11
Pb	208	1	No Gas	1163	0.19
U	238	1	No Gas	57	117.90
Ca	43	2	He	30	293.97
Sb	121	2	He	210	7.86
Ti	47	2	He	20	250.00
Cu	63	1	No Gas	2894	0.17

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD

Calibration Blank Report

Li	6	1	No Gas	931764	1.90
Ge	72	2	He	713484	0.94
Ge	72	1	No Gas	2088541	0.57
In	115	1	No Gas	2355410	1.36

Calibration Blank Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Bi	209	1	No Gas	2070771	2.28

Calibration Standard Report

Sample Table

Sample Name	2/10/200
Data File Name	009CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:08:50-06:00
Sample Type	CalStd
Level	2
Dilution	1
Comment	
ISTD Ref File Name	008CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	No Gas	5911	0.03
V	51	2	He	13352	0.01
Cr	52	2	He	15282	0.01
Fe	56	2	He	1089656	0.00
Se	78	2	He	437	1.93
As	75	2	He	2025	0.05
Ca	44	2	He	8376	0.06
Na	23	2	He	295962	0.00
Mg	24	2	He	111362	0.00
K	39	2	He	318484	0.00
Mn	55	2	He	12499	0.00
Co	59	2	He	14778	0.03
Ni	60	2	He	3531	0.08
Cu	63	2	He	10571	0.01
Zn	66	2	He	2404	0.12
Al	27	2	He	1777	0.24
B	11	1	No Gas	30735	0.00
Al	27	1	No Gas	51626	0.00
Si	28	1	No Gas	416739	0.00
Ag	107	1	No Gas	23264	0.01
Cd	111	1	No Gas	4711	0.12
Sr	88	1	No Gas	46919	0.00
Mo	95	1	No Gas	9130	0.04
Sn	118	1	No Gas	15803	0.02
Sb	121	1	No Gas	18837	0.01
Ba	137	1	No Gas	7426	0.03
Tl	205	1	No Gas	39209	0.00
Tl	203	1	No Gas	16227	0.01
Pb	208	1	No Gas	54758	0.00
U	238	1	No Gas	53467	0.00
Ca	43	2	He	483	2.91
Sb	121	2	He	10548	0.03
Cu	63	1	No Gas	20302	0.01

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	919641	0.68	931764	98.70	70	120	
Ge	72	2	He	710826	0.16	713484	99.63	70	120	
Ge	72	1	No Gas	2071566	0.53	2088541	99.19	70	120	

Calibration Standard Report

In	115	1	No Gas	2397215	0.72	2355410	101.77	70	120	
Bi	209	1	No Gas	2088804	1.41	2070771	100.87	70	120	

Calibration Standard Report

Sample Table

Sample Name	5/25/500
Data File Name	010CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:10:48-06:00
Sample Type	CalStd
Level	3
Dilution	1
Comment	
ISTD Ref File Name	008CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	No Gas	15429	0.01
V	51	2	He	27860	0.00
Cr	52	2	He	32215	0.01
Fe	56	2	He	2742459	0.00
Se	78	2	He	741	0.62
As	75	2	He	4615	0.07
Ca	44	2	He	20249	0.01
Na	23	2	He	572668	0.00
Mg	24	2	He	284733	0.00
K	39	2	He	564568	0.00
Mn	55	2	He	25948	0.01
Co	59	2	He	37866	0.01
Ni	60	2	He	8863	0.03
Cu	63	2	He	24532	0.01
Zn	66	2	He	5374	0.05
Al	27	2	He	3030	0.29
B	11	1	No Gas	55959	0.00
Al	27	1	No Gas	85569	0.00
Si	28	1	No Gas	485684	0.00
Ag	107	1	No Gas	58874	0.00
Cd	111	1	No Gas	12193	0.02
Sr	88	1	No Gas	119047	0.00
Mo	95	1	No Gas	23207	0.01
Sn	118	1	No Gas	37343	0.01
Sb	121	1	No Gas	46931	0.00
Ba	137	1	No Gas	19328	0.02
Tl	205	1	No Gas	101591	0.00
Tl	203	1	No Gas	42205	0.00
Pb	208	1	No Gas	139183	0.00
U	238	1	No Gas	137193	0.00
Ca	43	2	He	1090	1.46
Sb	121	2	He	27616	0.01
Cu	63	1	No Gas	47774	0.00

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	910315	2.71	931764	97.70	70	120	
Ge	72	2	He	711451	0.66	713484	99.72	70	120	
Ge	72	1	No Gas	2081608	1.10	2088541	99.67	70	120	

Calibration Standard Report

In	115	1	No Gas	2401882	0.34	2355410	101.97	70	120	
Bi	209	1	No Gas	2083660	2.76	2070771	100.62	70	120	

Calibration Standard Report

Sample Table

Sample Name	10/50/100
Data File Name	011CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:12:46-06:00
Sample Type	CalStd
Level	4
Dilution	1
Comment	
ISTD Ref File Name	008CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	No Gas	30533	0.01
V	51	2	He	52912	0.00
Cr	52	2	He	58867	0.00
Fe	56	2	He	5431626	0.00
Se	78	2	He	1199	0.06
As	75	2	He	9124	0.03
Ca	44	2	He	40878	0.00
Na	23	2	He	1029697	0.00
Mg	24	2	He	572603	0.00
K	39	2	He	991594	0.00
Mn	55	2	He	49654	0.00
Co	59	2	He	74393	0.00
Ni	60	2	He	18586	0.01
Cu	63	2	He	47841	0.00
Zn	66	2	He	10895	0.04
Al	27	2	He	5148	0.06
B	11	1	No Gas	98896	0.00
Al	27	1	No Gas	143568	0.00
Si	28	1	No Gas	634487	0.00
Ag	107	1	No Gas	120532	0.00
Cd	111	1	No Gas	24693	0.01
Sr	88	1	No Gas	238649	0.00
Mo	95	1	No Gas	46749	0.00
Sn	118	1	No Gas	75202	0.00
Sb	121	1	No Gas	99455	0.00
Ba	137	1	No Gas	38427	0.01
Tl	205	1	No Gas	205410	0.00
Tl	203	1	No Gas	86496	0.00
Pb	208	1	No Gas	282936	0.00
U	238	1	No Gas	280153	0.00
Ca	43	2	He	2324	0.09
Sb	121	2	He	55179	0.00
Cu	63	1	No Gas	91463	0.00

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	930655	0.30	931764	99.88	70	120	
Ge	72	2	He	708906	0.99	713484	99.36	70	120	
Ge	72	1	No Gas	2057208	2.46	2088541	98.50	70	120	

Calibration Standard Report

In	115	1	No Gas	2433842	1.41	2355410	103.33	70	120	
Bi	209	1	No Gas	2118234	1.94	2070771	102.29	70	120	

Calibration Standard Report

Sample Table

Sample Name	100/500/10K
Data File Name	012CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:14:44-06:00
Sample Type	CalStd
Level	5
Dilution	1
Comment	
ISTD Ref File Name	008CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	No Gas	304758	0.00
V	51	2	He	489414	0.00
Cr	52	2	He	539173	0.00
Fe	56	2	He	52712056	0.00
Se	78	2	He	9882	0.02
As	75	2	He	88457	0.00
Ca	44	2	He	394749	0.00
Na	23	2	He	8800546	0.00
Mg	24	2	He	5364573	0.00
K	39	2	He	8109321	0.00
Mn	55	2	He	449656	0.00
Co	59	2	He	733519	0.00
Ni	60	2	He	181815	0.00
Cu	63	2	He	463316	0.00
Zn	66	2	He	106076	0.00
Al	27	2	He	37578	0.01
B	11	1	No Gas	855953	0.00
Al	27	1	No Gas	1114018	0.00
Si	28	1	No Gas	3229488	0.00
Ag	107	1	No Gas	1198411	0.00
Cd	111	1	No Gas	238966	0.00
Sr	88	1	No Gas	2390961	0.00
Mo	95	1	No Gas	458325	0.00
Sn	118	1	No Gas	727912	0.00
Sb	121	1	No Gas	986445	0.00
Ba	137	1	No Gas	377122	0.00
Tl	205	1	No Gas	2121323	0.00
Tl	203	1	No Gas	858291	0.00
Pb	208	1	No Gas	2810359	0.00
U	238	1	No Gas	2929771	0.00
Ca	43	2	He	23337	0.00
Sb	121	2	He	560870	0.00
Cu	63	1	No Gas	859184	0.00

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	878633	1.88	931764	94.30	70	120	
Ge	72	2	He	701576	0.35	713484	98.33	70	120	
Ge	72	1	No Gas	2020187	2.53	2088541	96.73	70	120	

Calibration Standard Report

In	115	1	No Gas	2352214	0.66	2355410	99.86	70	120	
Bi	209	1	No Gas	2072860	1.12	2070771	100.10	70	120	

Calibration Standard Report

Sample Table

Sample Name	200/1000/20K
Data File Name	013CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:16:36-06:00
Sample Type	CalStd
Level	6
Dilution	1
Comment	
ISTD Ref File Name	008CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	No Gas	602014	0.00
V	51	2	He	983895	0.00
Cr	52	2	He	1072553	0.00
Fe	56	2	He	102958402	0.00
Se	78	2	He	18956	0.01
As	75	2	He	173570	0.00
Ca	44	2	He	781055	0.00
Na	23	2	He	17289040	0.00
Mg	24	2	He	10694105	0.00
K	39	2	He	15915293	0.00
Mn	55	2	He	877162	0.00
Co	59	2	He	1505152	0.00
Ni	60	2	He	354658	0.00
Cu	63	2	He	893359	0.00
Zn	66	2	He	206410	0.00
Al	27	2	He	72726	0.00
B	11	1	No Gas	1675507	0.00
Al	27	1	No Gas	2157892	0.00
Si	28	1	No Gas	5949471	0.00
Ag	107	1	No Gas	2354936	0.00
Cd	111	1	No Gas	473998	0.00
Sr	88	1	No Gas	4613812	0.00
Mo	95	1	No Gas	910125	0.00
Sn	118	1	No Gas	1469993	0.00
Sb	121	1	No Gas	2036073	0.00
Ba	137	1	No Gas	751319	0.00
Tl	205	1	No Gas	4146408	0.00
Tl	203	1	No Gas	1728079	0.00
Pb	208	1	No Gas	5656283	0.00
U	238	1	No Gas	5771433	0.00
Ca	43	2	He	46576	0.00
Sb	121	2	He	1161533	0.00
Cu	63	1	No Gas	1702139	0.00

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	843607	4.27	931764	90.54	70	120	
Ge	72	2	He	681191	0.27	713484	95.47	70	120	
Ge	72	1	No Gas	1980949	0.77	2088541	94.85	70	120	

Calibration Standard Report

In	115	1	No Gas	2309617	0.67	2355410	98.06	70	120	
Bi	209	1	No Gas	2058329	1.70	2070771	99.40	70	120	

Initial Calibration Verification (ICV) Report

Sample Table

Sample Name	ICV
Data File Name	015_ICV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:20:24-06:00
Sample Type	ICV
Dilution	1
Comment	
ISTD Ref File Name	008CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Li	7	1	No Gas	100.298	1.683	1166260	1.77	100	100.3	90	110	
Be	9	1	No Gas	102.159	0.418	319789	0.39	100	102.2	90	110	
V	51	2	He	99.193	0.689	506090	0.54	100	99.2	90	110	
Cr	52	2	He	100.821	0.495	562092	0.78	100	100.8	90	110	
Fe	56	2	He	9606.941	0.993	51438004	0.92	10000	96.1	90	110	
Se	78	2	He	101.953	1.407	10190	1.16	100	102.0	90	110	
As	75	2	He	105.047	1.377	94791	0.48	100	105.0	90	110	
Ca	44	2	He	9512.517	0.704	385586	1.17	10000	95.1	90	110	
Na	23	2	He	9762.584	1.531	8815800	1.66	10000	97.6	90	110	
Mg	24	2	He	9663.103	0.783	5352096	0.51	10000	96.6	90	110	
K	39	2	He	9486.275	1.662	7911665	0.70	10000	94.9	90	110	
Mn	55	2	He	104.238	1.057	477039	0.64	100	104.2	90	110	
Co	59	2	He	99.783	0.332	773396	0.76	100	99.8	90	110	
Ni	60	2	He	102.568	0.698	189233	0.54	100	102.6	90	110	
Cu	63	2	He	102.997	0.662	480221	0.46	100	103.0	90	110	
Zn	66	2	He	103.472	0.849	111226	0.39	100	103.5	90	110	
Al	27	2	He	102.267	1.041	39146	2.01	100	102.3	90	110	
B	11	1	No Gas	480.774	0.740	845266	0.78	500	96.2	90	110	
Al	27	1	No Gas	104.192	2.868	1165069	2.12	100	104.2	90	110	
Si	28	1	No Gas	523.714	1.180	3354943	0.50	500	104.7	90	110	
Ag	107	1	No Gas	98.314	5.284	1188673	2.45	100	98.3	90	110	
Cd	111	1	No Gas	102.258	3.806	248499	2.29	100	102.3	90	110	
Sr	88	1	No Gas	100.587	3.472	2392501	0.97	100	100.6	90	110	
Mo	95	1	No Gas	98.020	3.891	457194	1.54	100	98.0	90	110	
Sn	118	1	No Gas	96.838	2.325	727859	1.62	100	96.8	90	110	
Sb	121	1	No Gas	102.111	0.784	1054422	1.26	100	102.1	90	110	
Ba	137	1	No Gas	102.993	2.901	396418	1.39	100	103.0	90	110	
Tl	205	1	No Gas	106.276	0.630	2226164	1.33	100	106.3	90	110	
Tl	203	1	No Gas	103.126	1.918	895133	1.41	100	103.1	90	110	
Pb	208	1	No Gas	102.681	1.691	2917078	0.29	100	102.7	90	110	
U	238	1	No Gas	107.753	2.189	3135737	0.95	100	107.8	90	110	
Ca	43	2	He	9413.252	1.216	22713	2.29	10000	94.1	90	110	
Sb	121	2	He	102.861	1.062	614145	0.80	100	102.9	90	110	
Ti	47	2	He	99.896	5.865	21003	4.78	100	99.9	90	110	
Cu	63	1	No Gas	102.313	0.926	891374	0.14	100	102.3	90	110	
Se	82	1	No Gas	104.513	3.189	16213	3.69	100	104.5	90	110	

QC ISTD Table

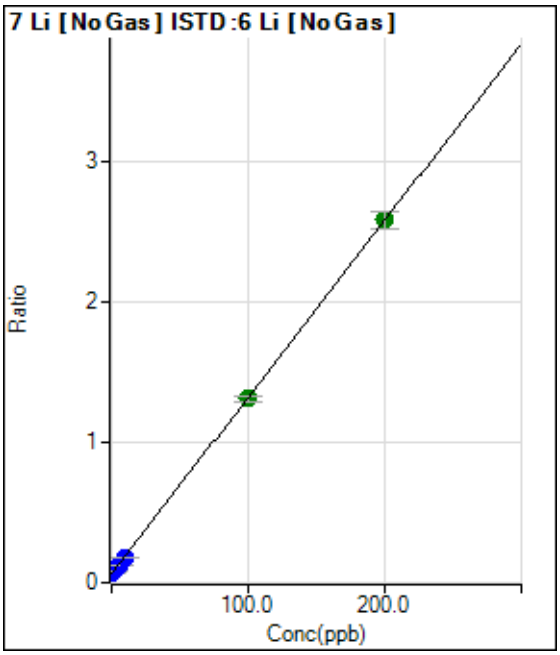
Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	881438	0.21	931764	94.60	70	120	
Ge	72	2	He	709238	1.09	713484	99.40	70	120	
Ge	72	1	No Gas	2029407	0.86	2088541	97.17	70	120	
In	115	1	No Gas	2374171	2.83	2355410	100.80	70	120	
Bi	209	1	No Gas	2073001	1.96	2070771	100.11	70	120	

Calibration for 015_ICV.d

Batch Folder: C:\Agilent\ICPMH\1\DATA\121521A.b\
Analysis File: 121521A.batch.bin
DA Date-Time: 12/15/2021 7:42:15 PM
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

Level	Standard Data File	Sample Name	Acq. Date-Time
1	008CALB.d	CAL BLK	12/15/2021 11:06:53 AM
2	009CALS.d	2/10/200	12/15/2021 11:08:50 AM
3	010CALS.d	5/25/500	12/15/2021 11:10:48 AM
4	011CALS.d	10/50/100	12/15/2021 11:12:46 AM
5	012CALS.d	100/500/10K	12/15/2021 11:14:44 AM
6	013CALS.d	200/1000/20K	12/15/2021 11:16:36 AM

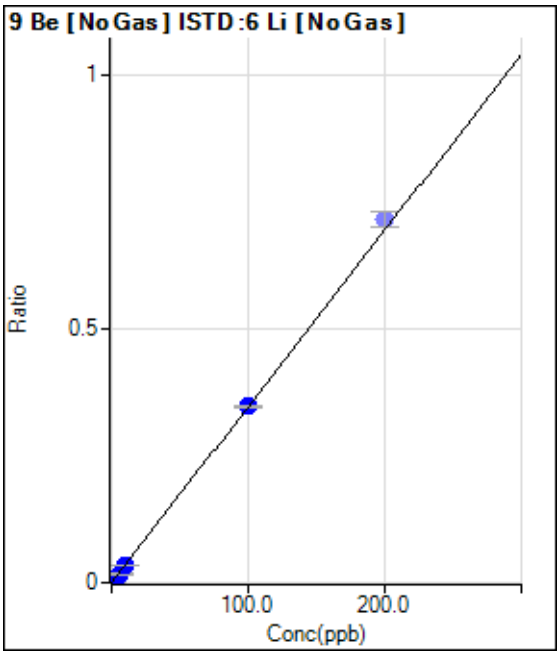
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	58628.02	0.0629	P	2.7
2	☐	2.000	1.810	78792.14	0.0857	P	0.6
3	☐	5.000	4.742	111488.67	0.1225	P	2.4
4	☐	10.000	9.165	165738.28	0.1781	P	1.1
5	☐	100.000	99.260	1150972.46	1.3101	A	3.1
6	☐	200.000	200.420	2174305.38	2.5811	A	5.1

y = 0.0126 * x + 0.0629
R = 1.0000
DL = 0.4019
BEC = 5.01

Weight: <None>
Min Conc: <None>

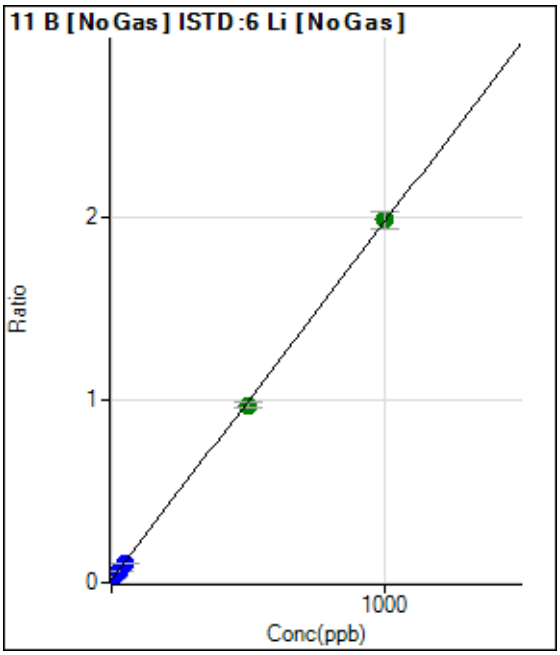


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	35.00	0.0000	P	38.2
2	☐	2.000	1.843	5911.29	0.0064	P	1.7
3	☐	5.000	4.880	15428.53	0.0170	P	2.6
4	☐	10.000	9.453	30533.13	0.0328	P	2.0
5	☐	100.000	100.064	304758.41	0.3469	P	1.9
6	☑	200.000		602014.46	0.7145	P	4.4

y = 0.0035 * x + 3.7589E-005
R = 1.0000
DL = 0.01243
BEC = 0.01084

Weight: <None>
Min Conc: <None>

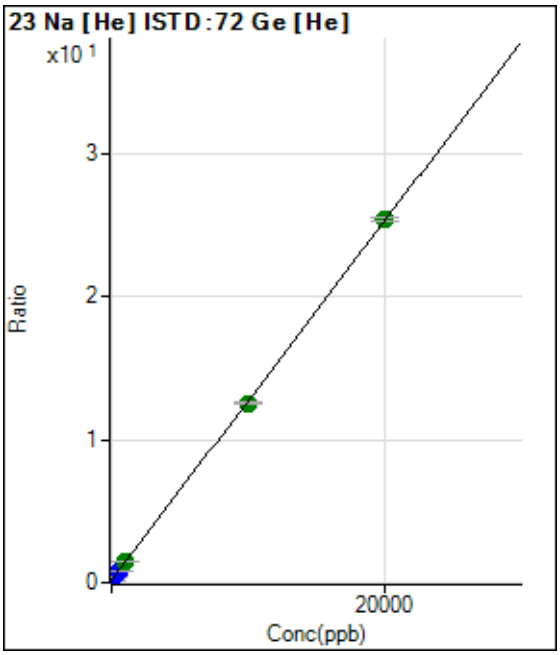
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	15086.53	0.0162	P	4.3
2	☐	10.000	8.783	30735.30	0.0334	P	1.6
3	☐	25.000	23.113	55959.36	0.0615	P	4.6
4	☐	50.000	45.927	98896.47	0.1063	P	4.1
5	☐	500.000	488.727	855953.48	0.9746	A	3.2
6	☐	1000.000	1005.900	1675507.37	1.9887	A	4.8

y = 0.0020 * x + 0.0162
R = 0.9999
DL = 1.058
BEC = 8.261

Weight: <None>
Min Conc: <None>

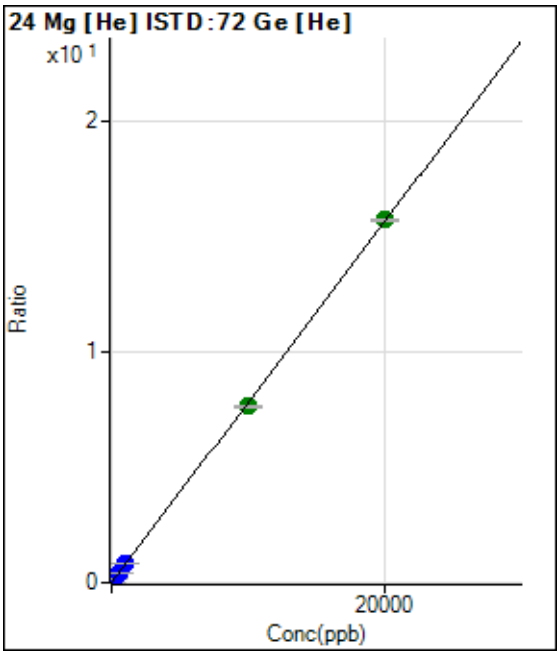


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	118768.40	0.1665	P	2.0
2	☐	200.000	198.922	295962.34	0.4164	P	0.8
3	☐	500.000	508.261	572668.50	0.8050	P	0.9
4	☐	1000.000	1023.779	1029697.20	1.4526	A	1.2
5	☐	10000.00	9853.266	8800545.91	12.5442	A	0.7
6	☐	20000.00	20071.98	17289039.74	25.3809	A	1.0

y = 0.0013 * x + 0.1665
R = 1.0000
DL = 7.979
BEC = 132.5

Weight: <None>
Min Conc: <None>

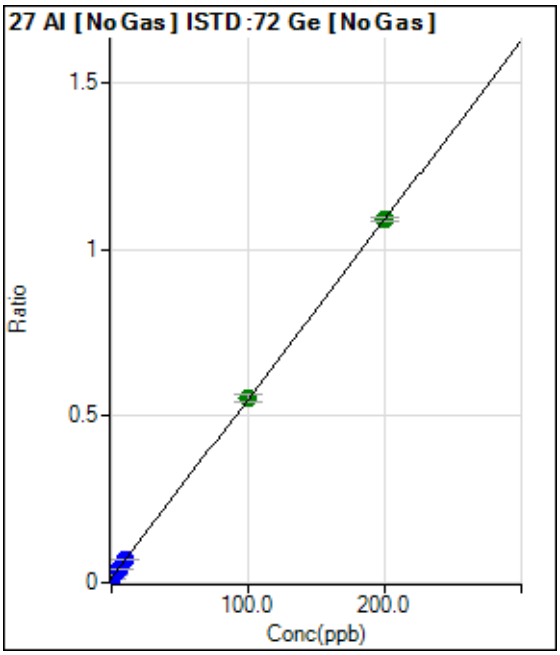
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	260.01	0.0004	P	43.2
2	☐	200.000	200.144	111362.24	0.1567	P	0.2
3	☐	500.000	512.031	284733.08	0.4002	P	1.1
4	☐	1000.000	1033.900	572602.53	0.8078	P	0.9
5	☐	10000.00	9790.616	5364572.63	7.6462	A	1.3
6	☐	20000.00	20102.69	10694104.84	15.6993	A	0.8

y = 7.8094E-004 * x + 3.6532E-004
R = 0.9999
DL = 0.6057
BEC = 0.4678

Weight: <None>
Min Conc: <None>

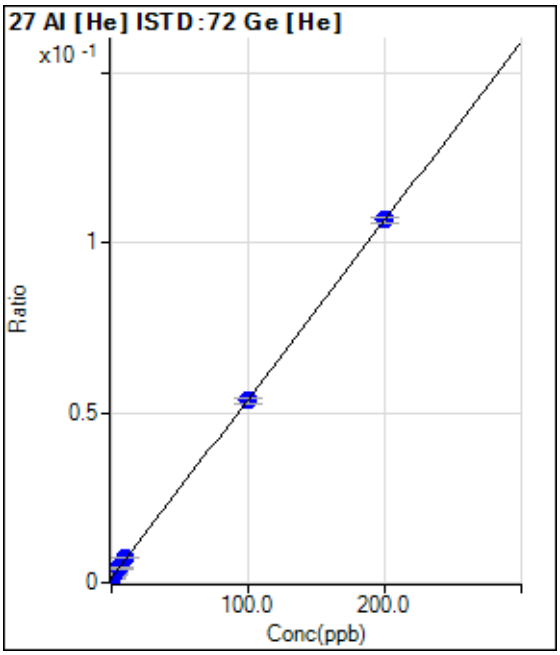


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	28716.77	0.0137	P	3.1
2	☐	2.000	2.077	51626.31	0.0249	P	1.0
3	☐	5.000	5.088	85568.91	0.0411	P	3.2
4	☐	10.000	10.424	143567.60	0.0698	P	2.6
5	☐	100.000	100.040	1114018.03	0.5518	A	4.3
6	☐	200.000	199.956	2157891.79	1.0893	A	1.1

y = 0.0054 * x + 0.0137
R = 1.0000
DL = 0.2399
BEC = 2.556

Weight: <None>
Min Conc: <None>

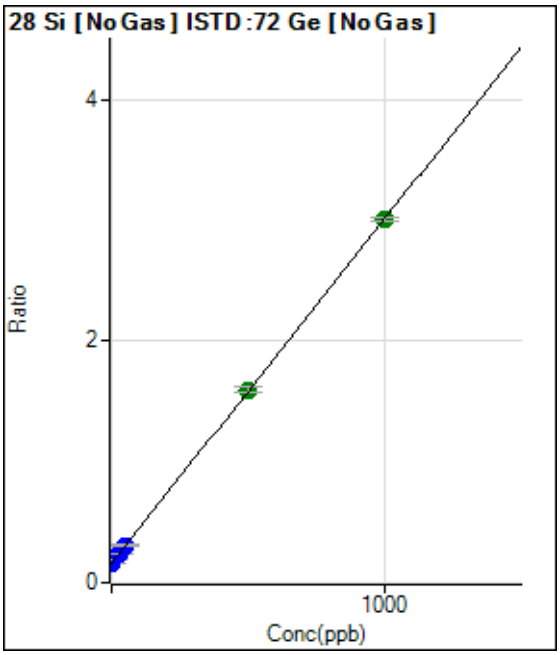
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1006.72	0.0014	P	12.2
2	☐	2.000	2.070	1776.81	0.0025	P	4.4
3	☐	5.000	5.418	3030.38	0.0043	P	9.4
4	☐	10.000	11.129	5147.71	0.0073	P	4.3
5	☐	100.000	99.176	37577.69	0.0536	P	2.6
6	☐	200.000	200.344	72726.42	0.1068	P	1.3

y = 5.2587E-004 * x + 0.0014
R = 1.0000
DL = 0.9836
BEC = 2.684

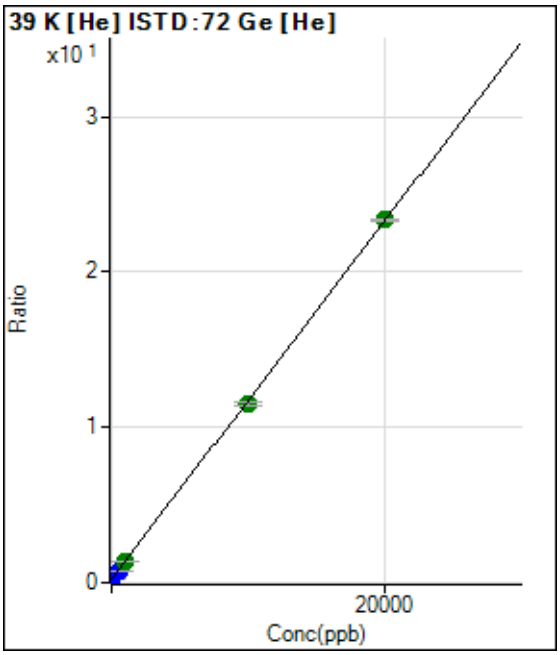
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	335760.93	0.1608	P	0.4
2	☐	10.000	14.203	416738.94	0.2012	P	10.1
3	☐	25.000	25.469	485684.00	0.2333	P	1.6
4	☐	50.000	51.851	634486.90	0.3085	P	2.2
5	☐	500.000	504.670	3229488.49	1.5990	A	2.2
6	☐	1000.000	997.519	5949471.37	3.0035	A	1.1

y = 0.0028 * x + 0.1608
R = 1.0000
DL = 0.7413
BEC = 56.41

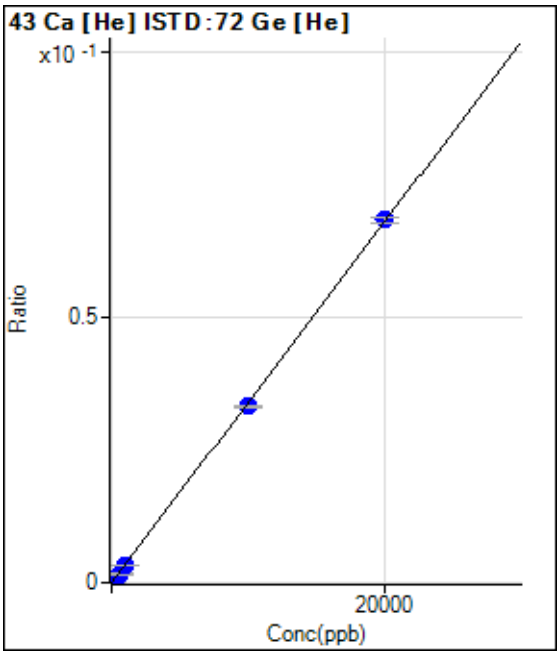
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	161478.41	0.2263	P	1.1
2	☐	200.000	192.427	318483.73	0.4481	P	0.6
3	☐	500.000	492.282	564567.52	0.7935	P	0.2
4	☐	1000.000	1017.715	991593.60	1.3989	A	2.6
5	☐	10000.00	9835.836	8109321.34	11.5592	A	2.4
6	☐	20000.00	20081.46	15915292.68	23.3642	A	0.7

y = 0.0012 * x + 0.2263
R = 1.0000
DL = 6.642
BEC = 196.4

Weight: <None>
Min Conc: <None>

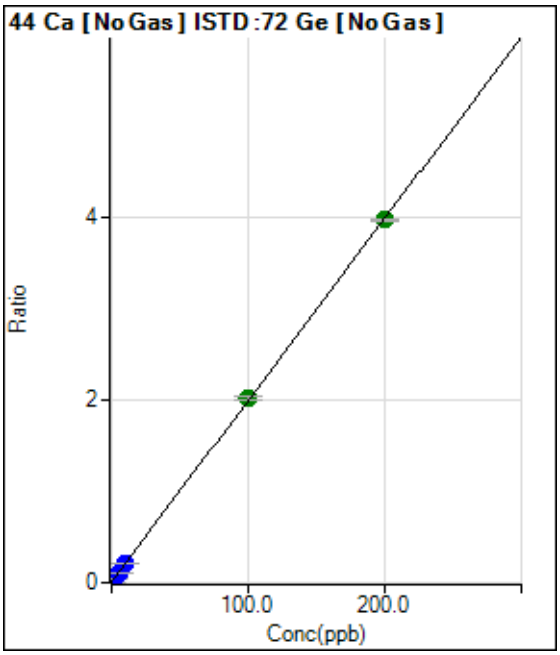


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	30.00	0.0000	P	87.9
2	☐	200.000	187.820	483.35	0.0007	P	14.1
3	☐	500.000	438.611	1090.06	0.0015	P	15.9
4	☐	1000.000	952.504	2323.57	0.0033	P	2.1
5	☐	10000.00	9778.968	23336.73	0.0333	P	0.7
6	☐	20000.00	20114.54	46575.62	0.0684	P	1.9

y = 3.3973E-006 * x + 4.1913E-005
R = 0.9999
DL = 32.53
BEC = 12.34

Weight: <None>
Min Conc: <None>

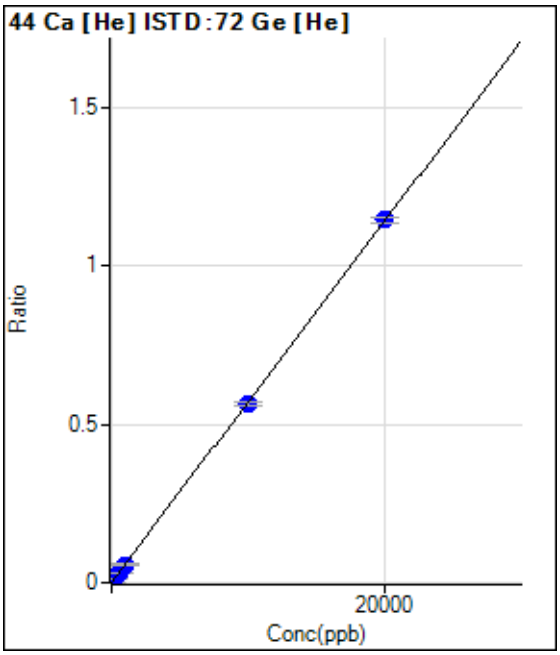
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	14247.65	0.0068	P	1.2
2	☐	2.000	1.974	95264.75	0.0460	P	0.2
3	☐	5.000	4.891	216184.86	0.1039	P	1.3
4	☐	10.000	10.093	425802.01	0.2071	P	2.8
5	☐	100.000	101.219	4069402.54	2.0151	A	2.5
6	☐	200.000	199.389	7850137.80	3.9629	A	0.7

y = 0.0198 * x + 0.0068
R = 1.0000
DL = 0.01238
BEC = 0.3438

Weight: <None>
Min Conc: <None>

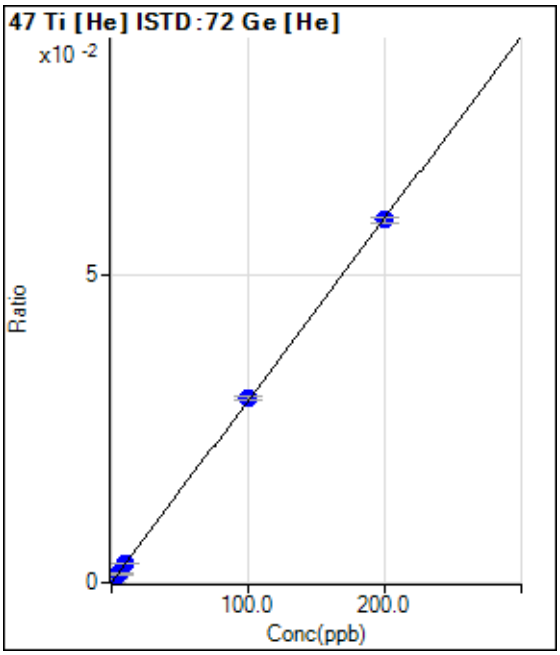


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	560.02	0.0008	P	10.5
2	☐	200.000	192.717	8376.01	0.0118	P	4.9
3	☐	500.000	484.923	20248.53	0.0285	P	1.9
4	☐	1000.000	996.662	40877.63	0.0577	P	1.9
5	☐	10000.00	9845.486	394749.10	0.5627	P	2.2
6	☐	20000.00	20077.87	781055.22	1.1466	P	1.8

y = 5.7070E-005 * x + 7.8454E-004
R = 1.0000
DL = 4.311
BEC = 13.75

Weight: <None>
Min Conc: <None>

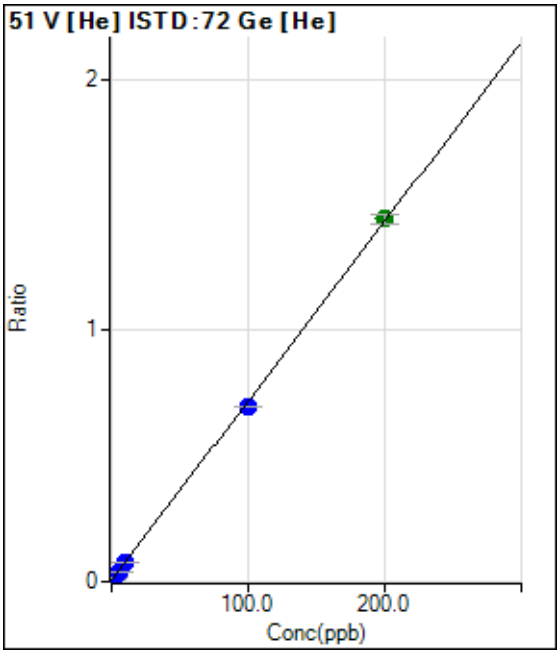
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	20.00	0.0000	P	49.4
2	☐	2.000	1.758	390.01	0.0005	P	4.6
3	☐	5.000	4.757	1023.39	0.0014	P	16.8
4	☐	10.000	10.189	2160.21	0.0030	P	3.5
5	☐	100.000	101.511	21119.90	0.0301	P	1.4
6	☐	200.000	199.244	40232.56	0.0591	P	1.6

y = 2.9629E-004 * x + 2.7953E-005
R = 1.0000
DL = 0.1398
BEC = 0.09434

Weight: <None>
Min Conc: <None>

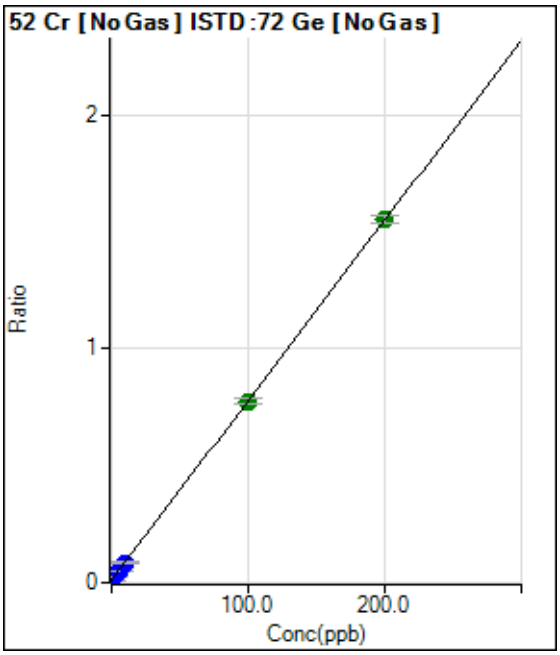


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	3837.23	0.0054	P	2.1
2	☐	2.000	1.878	13352.10	0.0188	P	1.8
3	☐	5.000	4.732	27860.49	0.0392	P	0.5
4	☐	10.000	9.702	52911.59	0.0747	P	2.8
5	☐	100.000	96.952	489413.71	0.6976	P	0.8
6	☐	200.000	201.547	983895.48	1.4444	A	2.5

y = 0.0071 * x + 0.0054
R = 0.9998
DL = 0.047
BEC = 0.7532

Weight: <None>
Min Conc: <None>

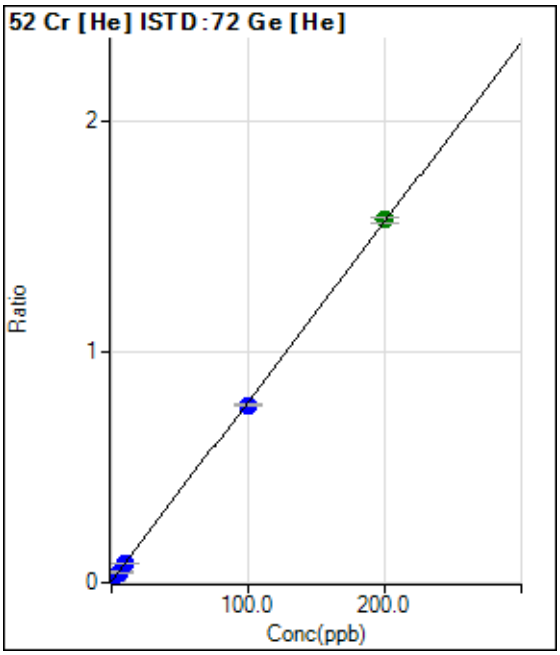
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	20886.36	0.0100	P	2.3
2	☐	2.000	1.938	51590.44	0.0249	P	1.6
3	☐	5.000	4.830	98103.02	0.0471	P	1.4
4	☐	10.000	9.859	176394.34	0.0858	P	3.1
5	☐	100.000	99.405	1563227.69	0.7742	A	2.9
6	☐	200.000	200.309	3069983.18	1.5499	A	2.0

y = 0.0077 * x + 0.0100
R = 1.0000
DL = 0.08963
BEC = 1.301

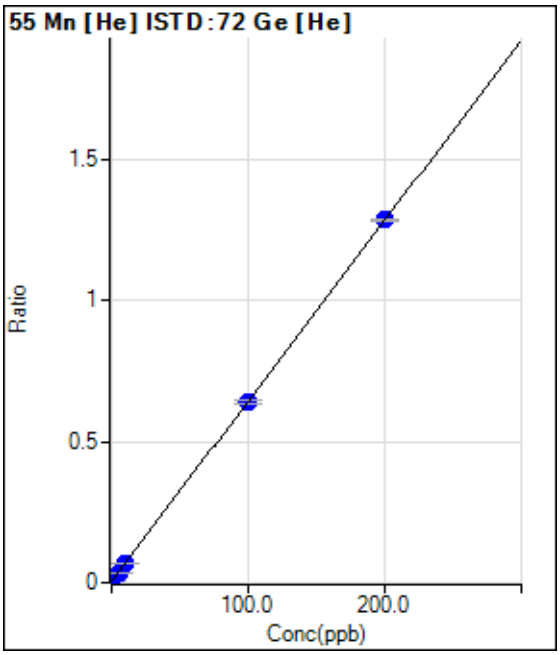
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4730.91	0.0066	P	3.9
2	☐	2.000	1.908	15282.05	0.0215	P	1.8
3	☐	5.000	4.957	32214.86	0.0453	P	3.8
4	☐	10.000	9.801	58866.59	0.0830	P	1.6
5	☐	100.000	97.740	539172.58	0.7685	P	1.1
6	☐	200.000	201.142	1072552.98	1.5746	A	1.8

y = 0.0078 * x + 0.0066
R = 0.9999
DL = 0.1
BEC = 0.8504

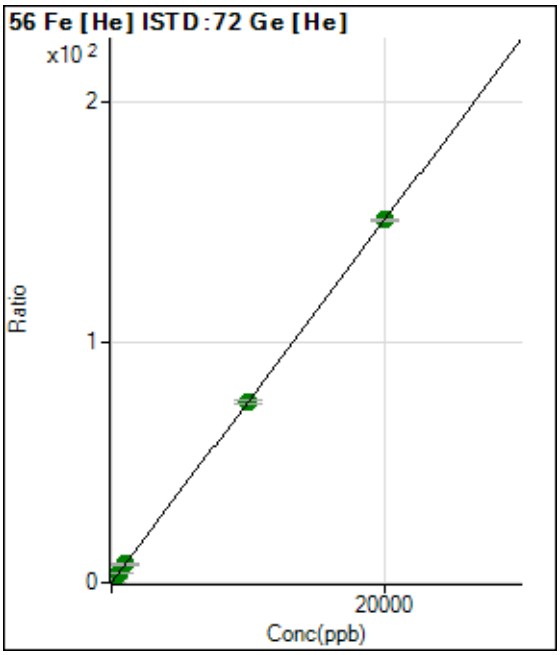
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4043.99	0.0057	P	7.6
2	☐	2.000	1.862	12499.26	0.0176	P	0.5
3	☐	5.000	4.815	25948.29	0.0365	P	3.1
4	☐	10.000	10.061	49653.78	0.0700	P	1.3
5	☐	100.000	99.283	449656.36	0.6409	P	1.8
6	☐	200.000	200.362	877161.71	1.2877	P	0.8

y = 0.0064 * x + 0.0057
R = 1.0000
DL = 0.202
BEC = 0.8862

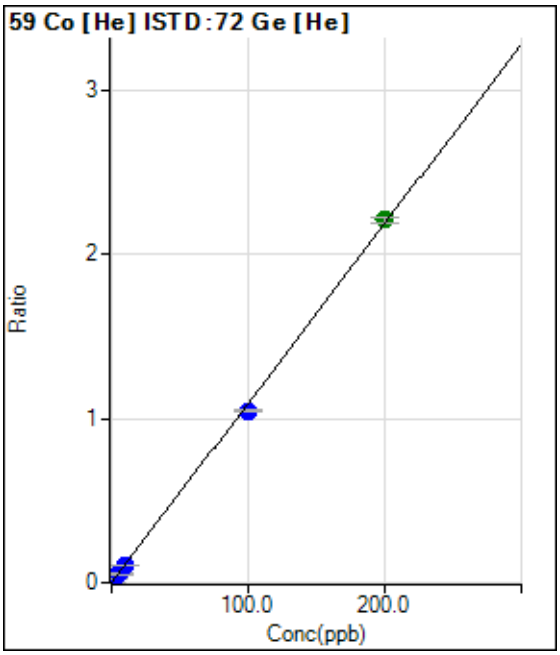
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	14911.86	0.0209	P	6.3
2	☐	200.000	200.335	1089655.56	1.5329	A	1.2
3	☐	500.000	507.947	2742459.02	3.8546	A	2.2
4	☐	1000.000	1012.551	5431625.55	7.6631	A	2.4
5	☐	10000.00	9952.420	52712055.88	75.1364	A	1.8
6	☐	20000.00	20022.96	102958401.8	151.143	A	0.6

y = 0.0075 * x + 0.0209
R = 1.0000
DL = 0.5227
BEC = 2.77

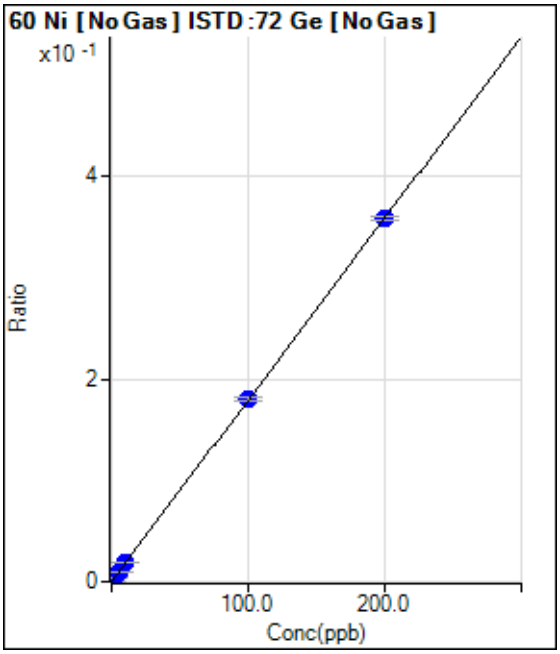
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	63.33	0.0001	P	23.4
2	☐	2.000	1.894	14778.30	0.0208	P	4.3
3	☐	5.000	4.863	37866.24	0.0532	P	3.1
4	☐	10.000	9.595	74392.71	0.1049	P	0.9
5	☐	100.000	95.672	733518.79	1.0456	P	1.5
6	☐	200.000	202.189	1505152.16	2.2095	A	1.4

y = 0.0109 * x + 8.8662E-005
R = 0.9997
DL = 0.005694
BEC = 0.008114

Weight: <None>
Min Conc: <None>

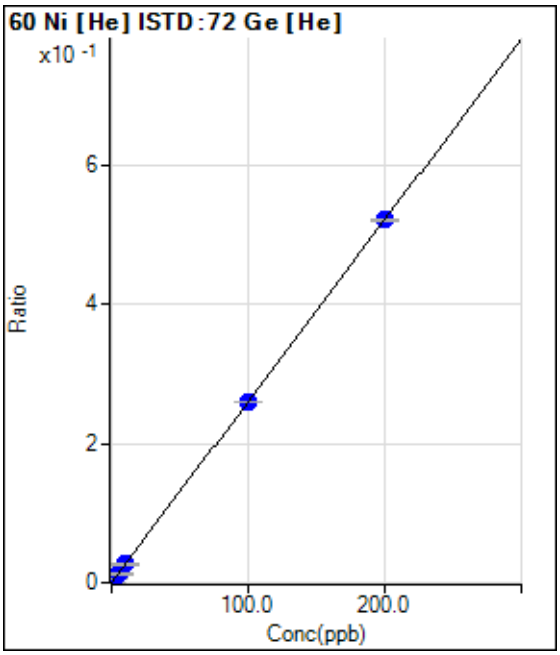


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	310.01	0.0001	P	17.0
2	☐	2.000	1.970	7615.63	0.0037	P	4.0
3	☐	5.000	4.959	18786.48	0.0090	P	4.4
4	☐	10.000	10.163	37735.87	0.0183	P	1.3
5	☐	100.000	100.402	363374.37	0.1799	P	2.3
6	☐	200.000	199.792	708991.06	0.3579	P	0.9

y = 0.0018 * x + 1.4842E-004
R = 1.0000
DL = 0.04232
BEC = 0.08288

Weight: <None>
Min Conc: <None>

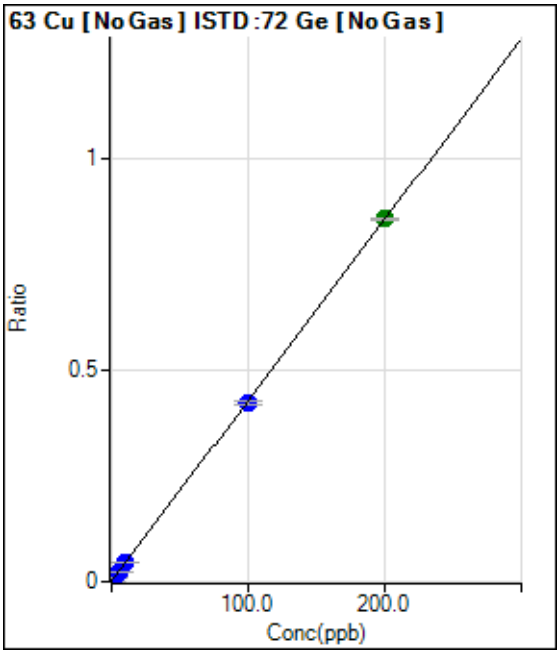
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	116.67	0.0002	P	35.0
2	☐	2.000	1.848	3530.53	0.0050	P	3.1
3	☐	5.000	4.730	8863.04	0.0125	P	3.6
4	☐	10.000	10.021	18586.27	0.0262	P	2.1
5	☐	100.000	99.617	181814.79	0.2592	P	0.2
6	☐	200.000	200.199	354657.56	0.5206	P	0.7

y = 0.0026 * x + 1.6318E-004
R = 1.0000
DL = 0.06599
BEC = 0.06276

Weight: <None>
Min Conc: <None>

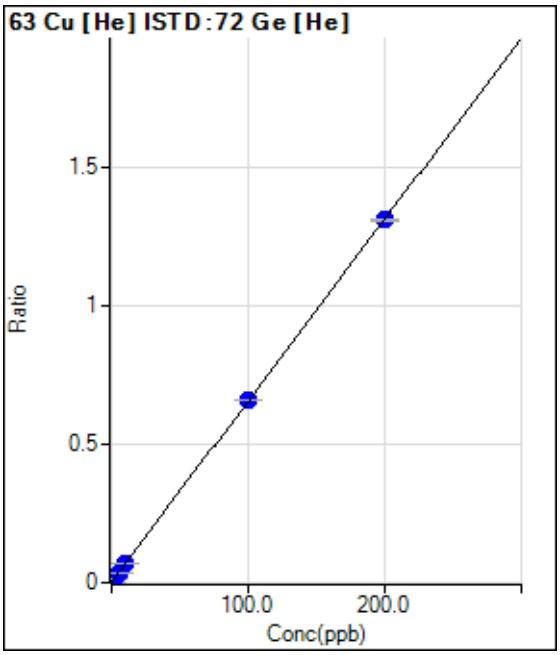


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2893.70	0.0014	P	5.4
2	☐	2.000	1.966	20302.08	0.0098	P	0.5
3	☐	5.000	5.039	47774.00	0.0230	P	1.5
4	☐	10.000	10.072	91462.82	0.0445	P	4.5
5	☐	100.000	99.090	859184.26	0.4255	P	2.2
6	☐	200.000	200.451	1702139.25	0.8592	A	0.7

y = 0.0043 * x + 0.0014
R = 1.0000
DL = 0.05242
BEC = 0.3238

Weight: <None>
Min Conc: <None>

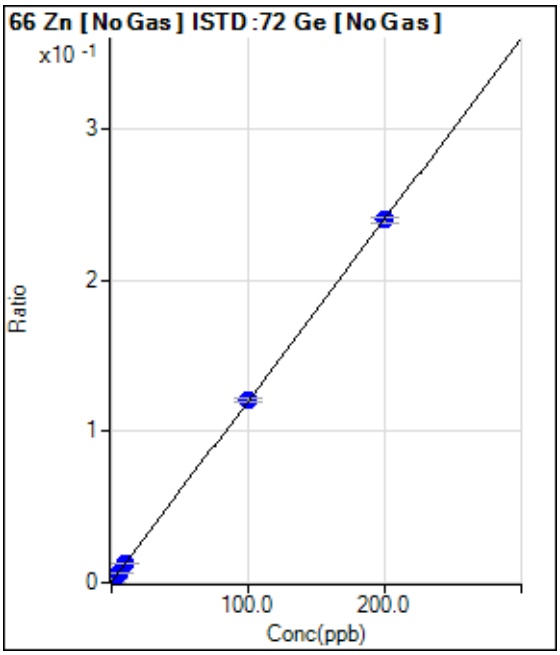
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1463.45	0.0021	P	12.4
2	☐	2.000	1.956	10570.96	0.0149	P	1.5
3	☐	5.000	4.949	24532.43	0.0345	P	2.6
4	☐	10.000	9.984	47841.08	0.0675	P	0.5
5	☐	100.000	100.444	463315.92	0.6604	P	0.7
6	☐	200.000	199.780	893359.00	1.3115	P	0.6

y = 0.0066 * x + 0.0021
R = 1.0000
DL = 0.1168
BEC = 0.3128

Weight: <None>
Min Conc: <None>

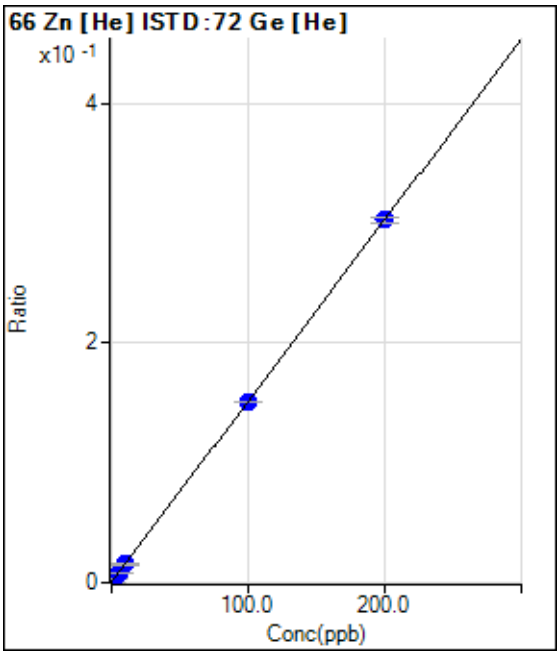


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	636.69	0.0003	P	14.1
2	☐	2.000	2.009	5631.27	0.0027	P	2.2
3	☐	5.000	4.926	12949.77	0.0062	P	3.6
4	☐	10.000	10.171	25758.08	0.0125	P	0.9
5	☐	100.000	100.377	244131.66	0.1209	P	1.6
6	☐	200.000	199.805	476020.83	0.2403	P	1.4

y = 0.0012 * x + 3.0487E-004
R = 1.0000
DL = 0.1077
BEC = 0.2538

Weight: <None>
Min Conc: <None>

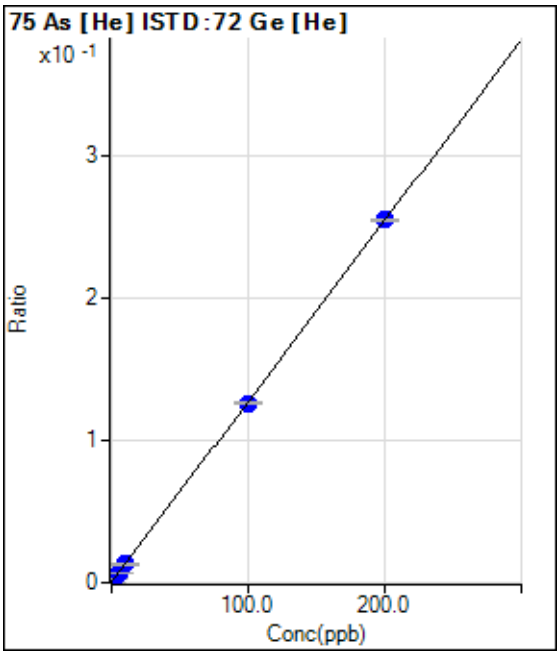
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	253.34	0.0004	P	15.4
2	☐	2.000	2.001	2403.59	0.0034	P	2.8
3	☐	5.000	4.760	5374.49	0.0076	P	1.9
4	☐	10.000	9.927	10894.54	0.0154	P	3.9
5	☐	100.000	99.744	106075.82	0.1512	P	0.5
6	☐	200.000	200.138	206409.59	0.3030	P	1.8

y = 0.0015 * x + 3.5490E-004
R = 1.0000
DL = 0.1083
BEC = 0.2347

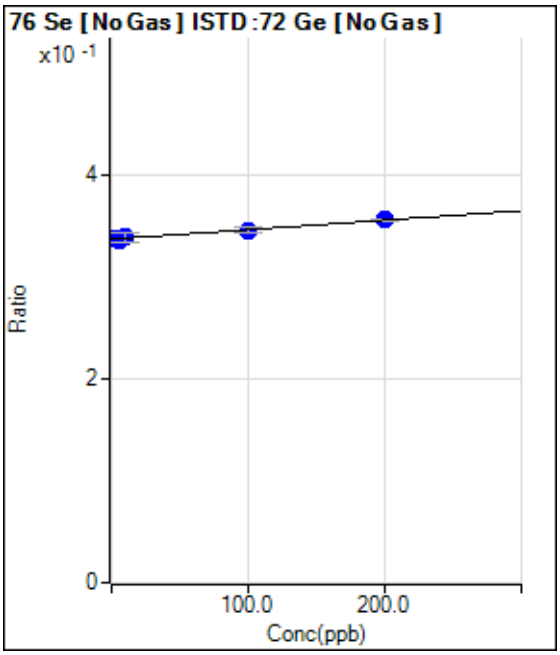
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	216.67	0.0003	P	6.5
2	☐	2.000	2.004	2024.61	0.0028	P	1.2
3	☐	5.000	4.871	4615.26	0.0065	P	3.3
4	☐	10.000	9.901	9124.24	0.0129	P	3.2
5	☐	100.000	99.077	88457.46	0.1261	P	1.0
6	☐	200.000	200.470	173569.71	0.2548	P	0.7

y = 0.0013 * x + 3.0380E-004
R = 1.0000
DL = 0.04665
BEC = 0.2393

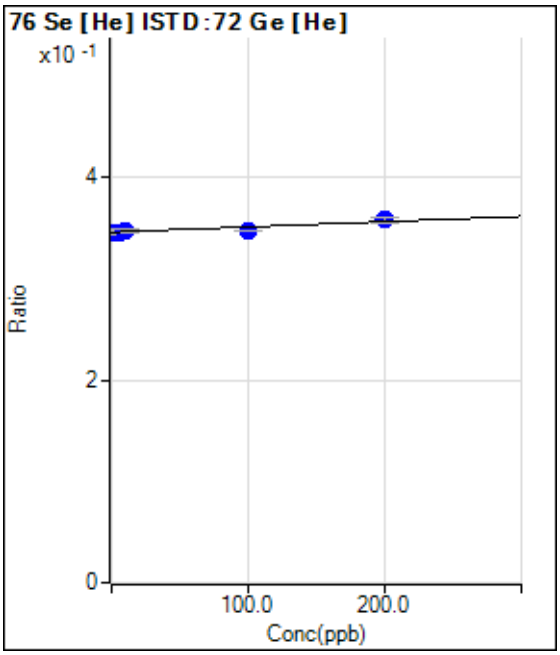
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	702503.12	0.3364	P	0.9
2	☐	2.000	7.485	698254.83	0.3371	P	0.1
3	☐	5.000	-17.753	696702.73	0.3347	P	0.9
4	☐	10.000	19.821	695467.54	0.3382	P	2.8
5	☐	100.000	95.981	697355.95	0.3453	P	2.1
6	☐	200.000	202.033	703595.72	0.3552	P	0.9

y = 9.3189E-005 * x + 0.3364
R = 0.9908
DL = 96.95
BEC = 3610

Weight: <None>
Min Conc: <None>

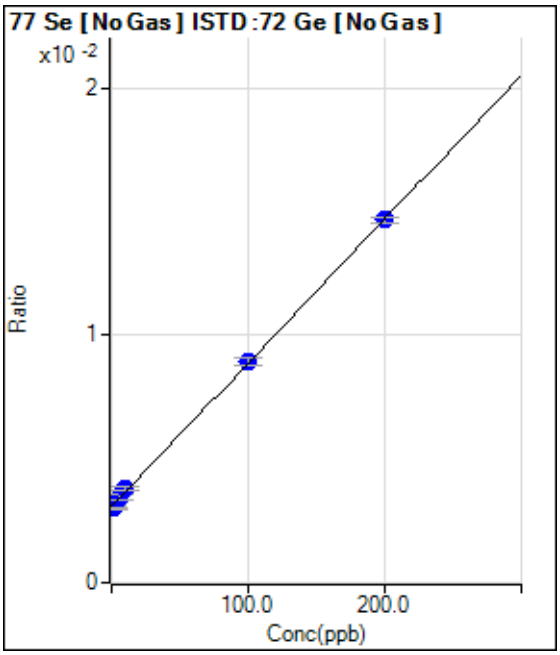


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	246910.93	0.3461	P	0.1
2	☐	2.000	-2.650	245896.80	0.3459	P	1.5
3	☐	5.000	-2.487	246107.47	0.3459	P	1.0
4	☐	10.000	33.619	246553.04	0.3478	P	1.0
5	☐	100.000	35.658	244088.77	0.3479	P	0.2
6	☐	200.000	231.224	243913.92	0.3581	P	1.3

y = 5.1926E-005 * x + 0.3461
R = 0.9294
DL = 10.09
BEC = 6665

Weight: <None>
Min Conc: <None>

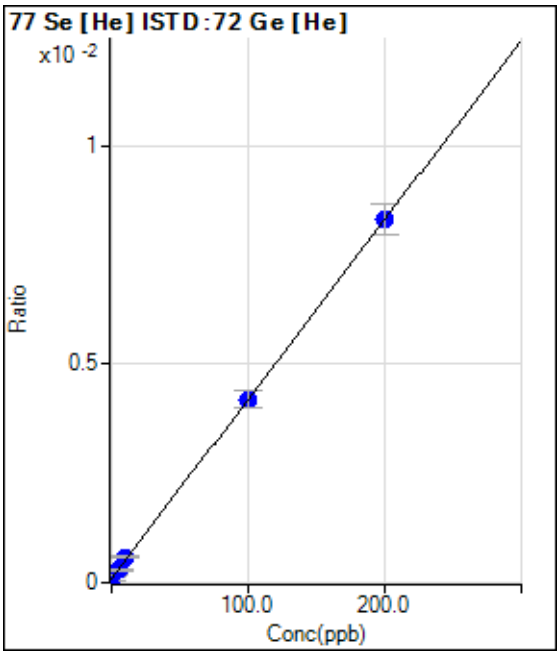
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	6414.99	0.0031	P	3.1
2	☐	2.000	-1.337	6201.53	0.0030	P	1.3
3	☐	5.000	6.296	7152.02	0.0034	P	7.5
4	☐	10.000	12.441	7802.44	0.0038	P	4.1
5	☐	100.000	100.871	18039.03	0.0089	P	4.2
6	☐	200.000	199.443	29051.79	0.0147	P	1.7

y = 5.8138E-005 * x + 0.0031
R = 0.9997
DL = 4.976
BEC = 52.83

Weight: <None>
Min Conc: <None>

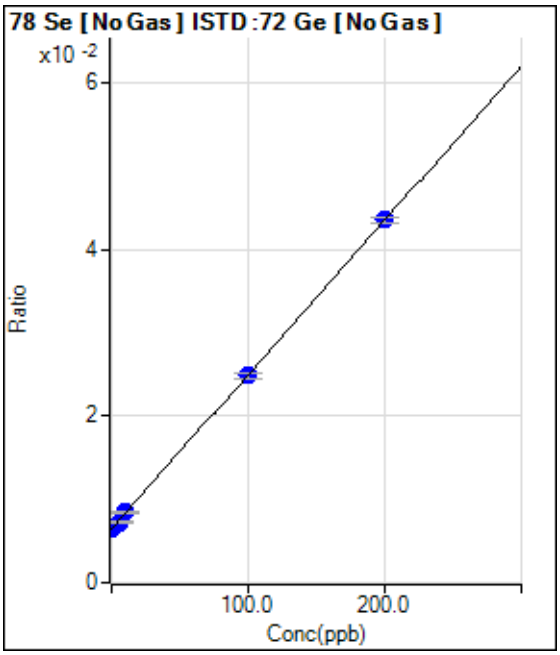


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	66.67	0.0001	P	83.6
2	☐	2.000	2.965	153.34	0.0002	P	29.3
3	☐	5.000	4.788	206.67	0.0003	P	19.7
4	☐	10.000	12.033	416.68	0.0006	P	6.0
5	☐	100.000	99.781	2940.39	0.0042	P	9.2
6	☐	200.000	200.004	5657.96	0.0083	P	8.3

y = 4.1062E-005 * x + 9.3930E-005
R = 0.9999
DL = 5.734
BEC = 2.288

Weight: <None>
Min Conc: <None>

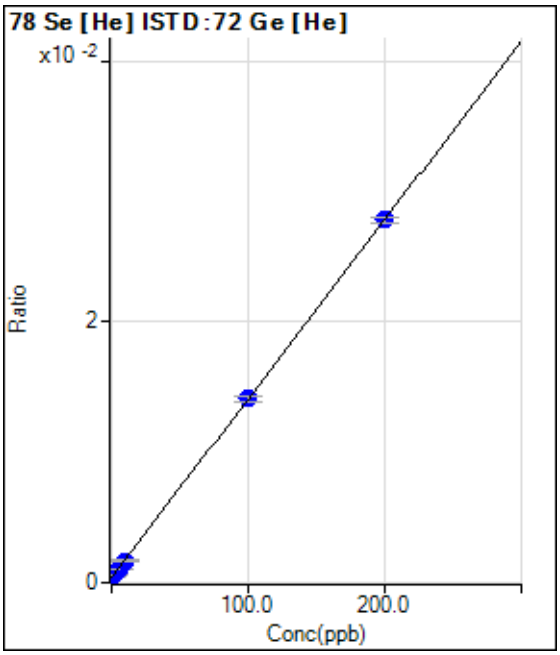
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	13533.68	0.0065	P	1.7
2	☐	2.000	1.511	14004.13	0.0068	P	2.5
3	☐	5.000	4.180	15102.00	0.0073	P	3.1
4	☐	10.000	10.557	17351.50	0.0084	P	1.9
5	☐	100.000	99.431	50247.17	0.0249	P	2.5
6	☐	200.000	200.282	86261.74	0.0435	P	1.3

y = 1.8508E-004 * x + 0.0065
R = 1.0000
DL = 1.764
BEC = 35.01

Weight: <None>
Min Conc: <None>

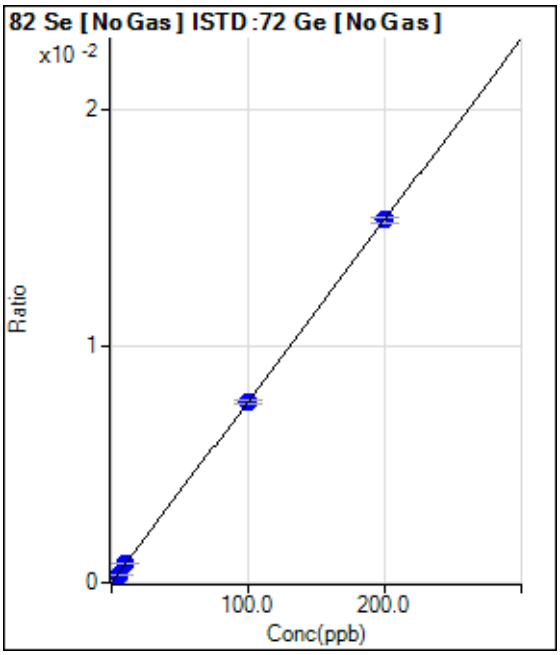


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	274.00	0.0004	P	6.8
2	☐	2.000	1.677	436.68	0.0006	P	8.3
3	☐	5.000	4.798	741.35	0.0010	P	5.2
4	☐	10.000	9.535	1199.39	0.0017	P	0.8
5	☐	100.000	99.900	9882.31	0.0141	P	2.1
6	☐	200.000	200.082	18955.96	0.0278	P	1.7

y = 1.3716E-004 * x + 3.8419E-004
R = 1.0000
DL = 0.5681
BEC = 2.801

Weight: <None>
Min Conc: <None>

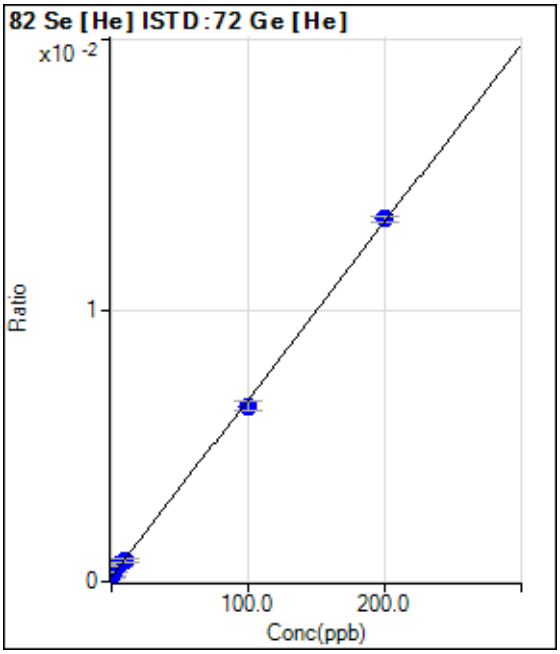
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	-28.74	0.0000	P	-256.6
2	☐	2.000	1.596	224.17	0.0001	P	54.8
3	☐	5.000	4.351	664.54	0.0003	P	5.2
4	☐	10.000	10.770	1668.89	0.0008	P	4.2
5	☐	100.000	99.703	15391.26	0.0076	P	2.5
6	☐	200.000	200.130	30327.22	0.0153	P	1.7

y = 7.6566E-005 * x - 1.3891E-005
R = 1.0000
DL = 1.397
BEC = -0.1814

Weight: <None>
Min Conc: <None>

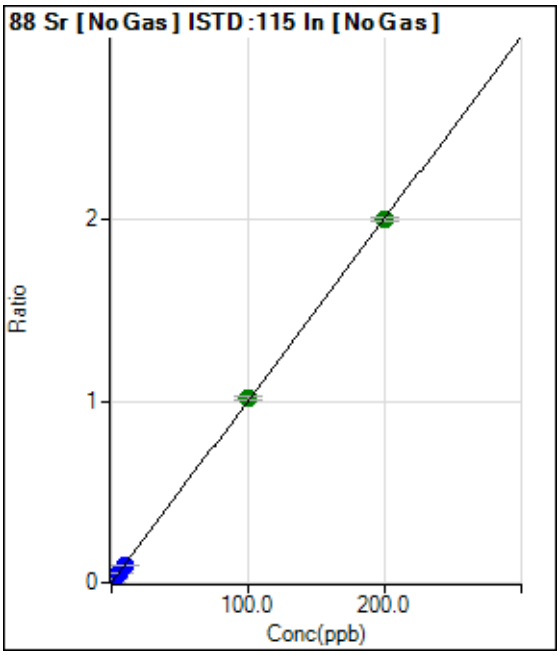


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	126.67	0.0002	P	12.1
2	☐	2.000	2.663	250.01	0.0004	P	14.4
3	☐	5.000	6.672	436.68	0.0006	P	5.0
4	☐	10.000	8.860	536.69	0.0008	P	18.1
5	☐	100.000	96.418	4547.52	0.0065	P	4.6
6	☐	200.000	201.800	9109.92	0.0134	P	1.9

y = 6.5392E-005 * x + 1.7756E-004
R = 0.9997
DL = 0.9884
BEC = 2.715

Weight: <None>
Min Conc: <None>

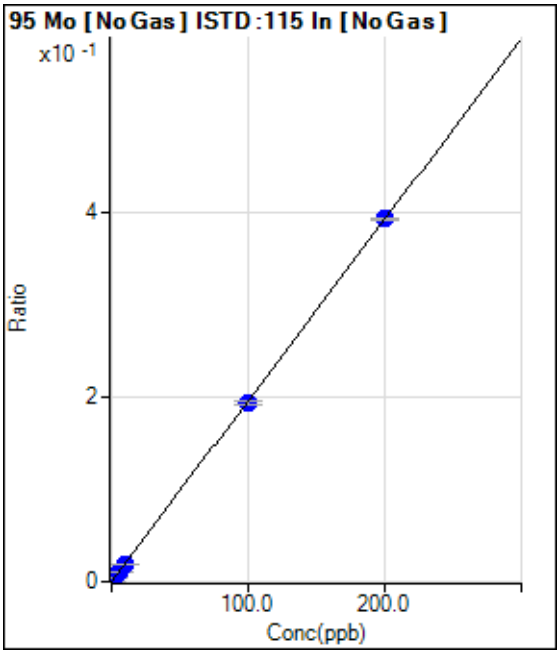
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1140.07	0.0005	P	3.4
2	☐	2.000	1.905	46918.98	0.0196	P	2.6
3	☐	5.000	4.898	119046.74	0.0496	P	0.3
4	☐	10.000	9.739	238649.35	0.0981	P	1.6
5	☐	100.000	101.401	2390961.22	1.0165	A	1.1
6	☐	200.000	199.316	4613811.91	1.9976	A	1.1

y = 0.0100 * x + 4.8415E-004
R = 1.0000
DL = 0.004905
BEC = 0.04832

Weight: <None>
Min Conc: <None>

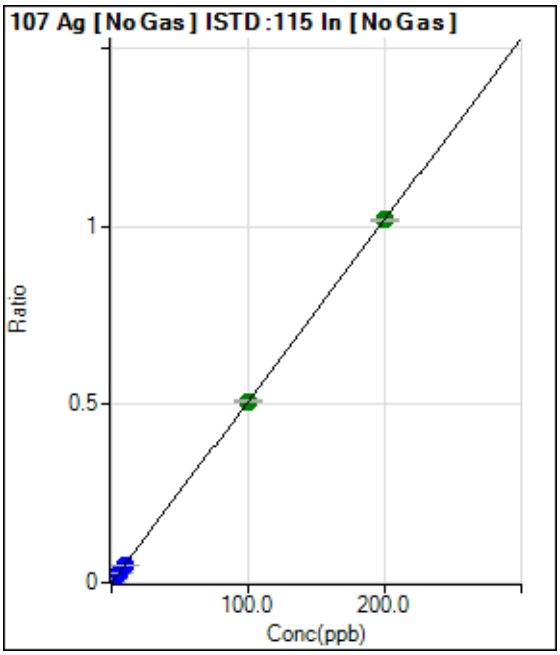


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	60.00	0.0000	P	33.6
2	☐	2.000	1.924	9129.97	0.0038	P	3.1
3	☐	5.000	4.902	23207.23	0.0097	P	3.2
4	☐	10.000	9.760	46748.81	0.0192	P	1.9
5	☐	100.000	99.110	458324.74	0.1948	P	1.9
6	☐	200.000	200.460	910125.01	0.3941	P	0.5

y = 0.0020 * x + 2.5474E-005
R = 1.0000
DL = 0.01306
BEC = 0.01296

Weight: <None>
Min Conc: <None>

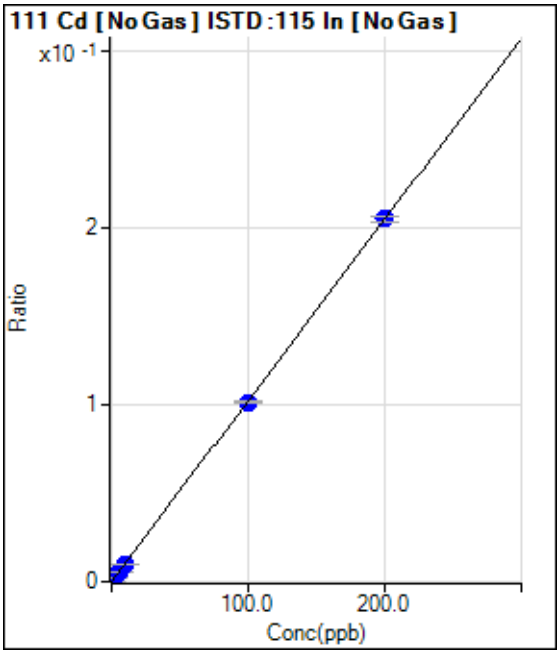
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	303.34	0.0001	P	25.3
2	☐	2.000	1.879	23264.18	0.0097	P	1.9
3	☐	5.000	4.785	58874.37	0.0245	P	0.2
4	☐	10.000	9.694	120532.21	0.0495	P	2.4
5	☐	100.000	99.941	1198411.10	0.5095	A	1.2
6	☐	200.000	200.051	2354936.48	1.0196	A	0.8

y = 0.0051 * x + 1.2851E-004
R = 1.0000
DL = 0.01913
BEC = 0.02522

Weight: <None>
Min Conc: <None>

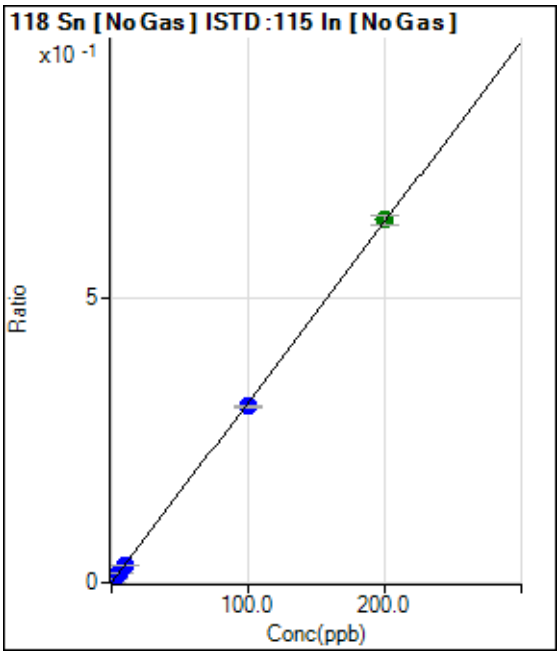


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	23.33	0.0000	P	108.7
2	☐	2.000	1.910	4710.93	0.0020	P	6.3
3	☐	5.000	4.948	12192.52	0.0051	P	2.9
4	☐	10.000	9.899	24693.49	0.0101	P	2.2
5	☐	100.000	99.194	238966.40	0.1016	P	0.8
6	☐	200.000	200.410	473997.53	0.2052	P	1.9

y = 0.0010 * x + 9.9156E-006
R = 1.0000
DL = 0.03157
BEC = 0.009683

Weight: <None>
Min Conc: <None>

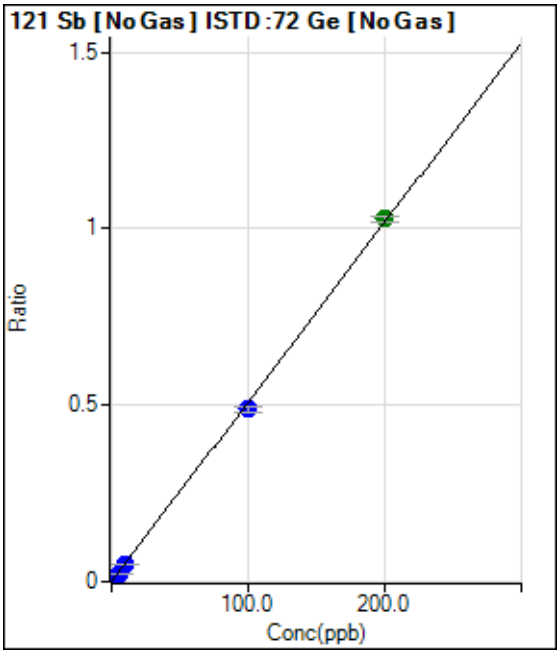
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1243.42	0.0005	P	8.3
2	☐	2.000	1.919	15803.17	0.0066	P	4.4
3	☐	5.000	4.751	37343.46	0.0155	P	3.0
4	☐	10.000	9.607	75201.72	0.0309	P	0.8
5	☐	100.000	97.711	727912.02	0.3094	P	1.0
6	☐	200.000	201.171	1469992.90	0.6365	A	2.6

y = 0.0032 * x + 5.2762E-004
R = 0.9999
DL = 0.04158
BEC = 0.1669

Weight: <None>
Min Conc: <None>

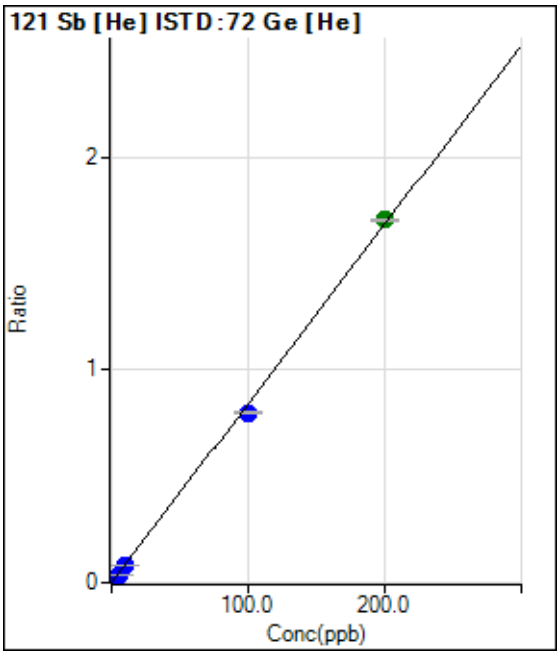


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	336.68	0.0002	P	2.9
2	☐	2.000	1.756	18837.10	0.0091	P	0.9
3	☐	5.000	4.401	46930.76	0.0225	P	0.5
4	☐	10.000	9.476	99455.02	0.0484	P	2.3
5	☐	100.000	96.006	986444.80	0.4885	P	2.9
6	☐	200.000	202.041	2036073.25	1.0279	A	1.2

y = 0.0051 * x + 1.6119E-004
R = 0.9997
DL = 0.002784
BEC = 0.03169

Weight: <None>
Min Conc: <None>

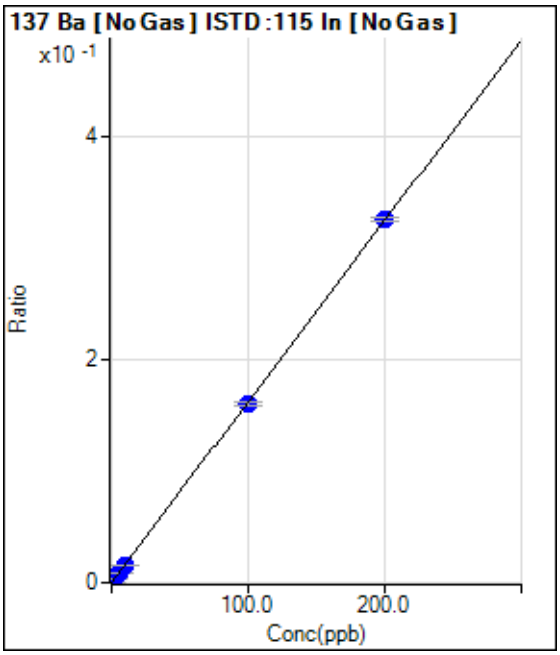
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	210.01	0.0003	P	16.1
2	☐	2.000	1.728	10547.70	0.0148	P	2.8
3	☐	5.000	4.578	27616.02	0.0388	P	3.5
4	☐	10.000	9.215	55179.50	0.0778	P	1.2
5	☐	100.000	94.956	560869.93	0.7994	P	0.4
6	☐	200.000	202.575	1161532.75	1.7052	A	0.7

y = 0.0084 * x + 2.9423E-004
R = 0.9996
DL = 0.01687
BEC = 0.03496

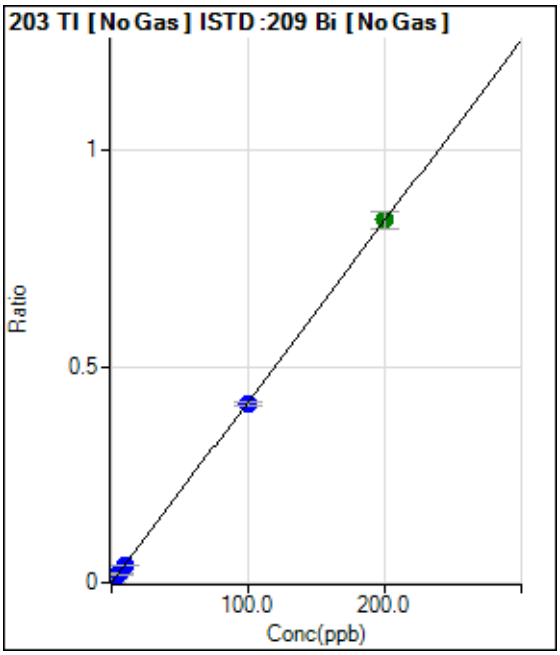
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	146.67	0.0001	P	28.5
2	☐	2.000	1.872	7425.58	0.0031	P	2.5
3	☐	5.000	4.925	19328.11	0.0080	P	3.9
4	☐	10.000	9.703	38427.37	0.0158	P	3.9
5	☐	100.000	98.847	377122.10	0.1603	P	1.5
6	☐	200.000	200.595	751319.11	0.3253	P	1.1

y = 0.0016 * x + 6.2394E-005
R = 1.0000
DL = 0.03289
BEC = 0.03848

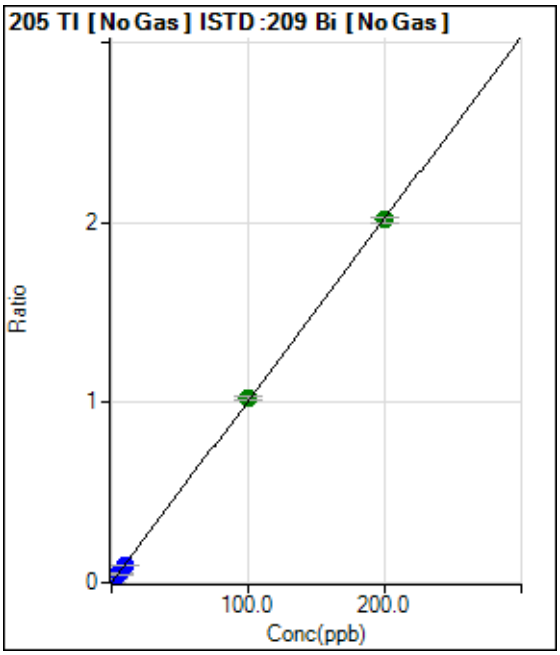
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	76.67	0.0000	P	35.3
2	☐	2.000	1.847	16227.49	0.0078	P	2.8
3	☐	5.000	4.830	42204.85	0.0203	P	2.6
4	☐	10.000	9.745	86495.62	0.0408	P	2.2
5	☐	100.000	98.876	858291.24	0.4141	P	1.3
6	☐	200.000	200.581	1728079.09	0.8400	A	4.6

y = 0.0042 * x + 3.6840E-005
R = 1.0000
DL = 0.009313
BEC = 0.008798

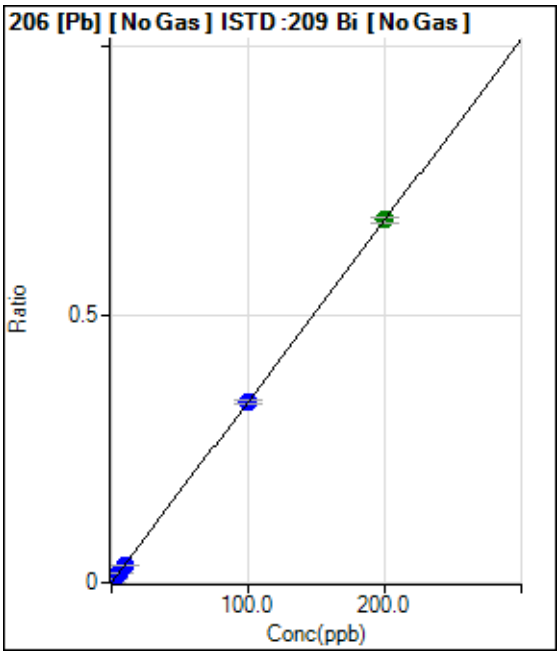
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	226.67	0.0001	P	22.7
2	☐	2.000	1.847	39208.63	0.0188	P	2.8
3	☐	5.000	4.818	101591.22	0.0488	P	5.0
4	☐	10.000	9.589	205409.70	0.0970	P	2.5
5	☐	100.000	101.287	2121323.25	1.0236	A	2.4
6	☐	200.000	199.383	4146407.65	2.0148	A	1.6

y = 0.0101 * x + 1.0909E-004
R = 1.0000
DL = 0.007359
BEC = 0.0108

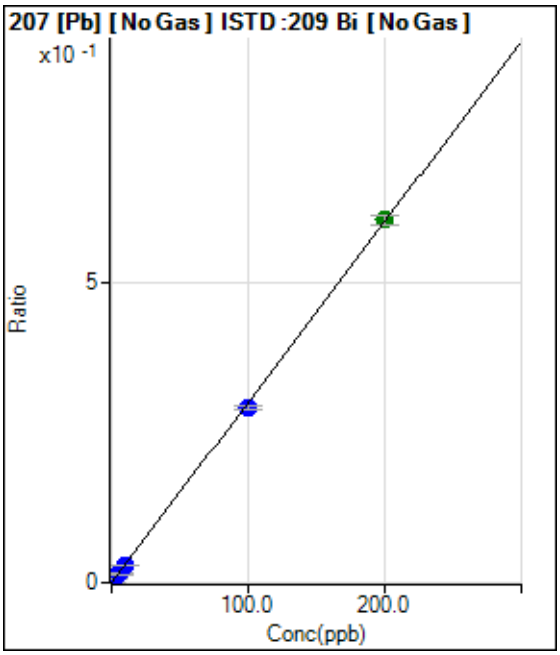
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	250.01	0.0001	P	5.8
2	☐	2.000	1.950	14018.09	0.0067	P	3.1
3	☐	5.000	4.897	34715.39	0.0167	P	3.6
4	☐	10.000	9.847	70730.47	0.0334	P	2.8
5	☐	100.000	99.398	696515.09	0.3361	P	1.9
6	☐	200.000	200.312	1393526.70	0.6771	A	1.4

y = 0.0034 * x + 1.2063E-004
R = 1.0000
DL = 0.006175
BEC = 0.03569

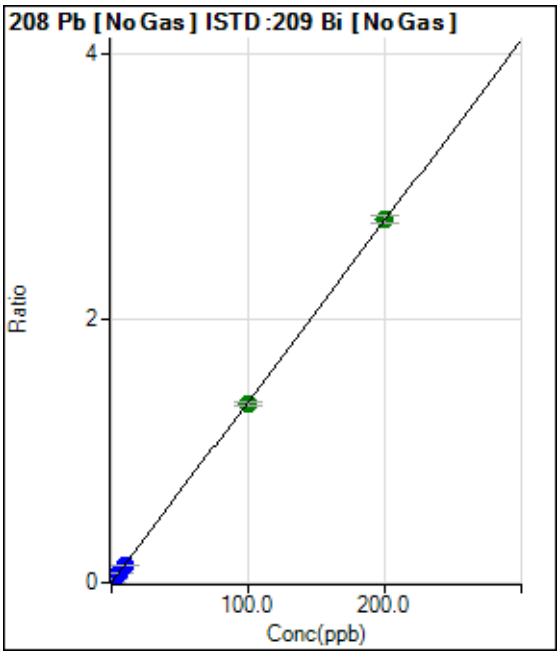
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	306.68	0.0001	P	19.4
2	☐	2.000	1.826	11755.75	0.0056	P	2.5
3	☐	5.000	4.812	30387.45	0.0146	P	2.7
4	☐	10.000	9.523	60838.47	0.0287	P	2.6
5	☐	100.000	97.532	607046.46	0.2929	P	2.2
6	☐	200.000	201.264	1243347.79	0.6042	A	2.5

y = 0.0030 * x + 1.4803E-004
R = 0.9999
DL = 0.02865
BEC = 0.04932

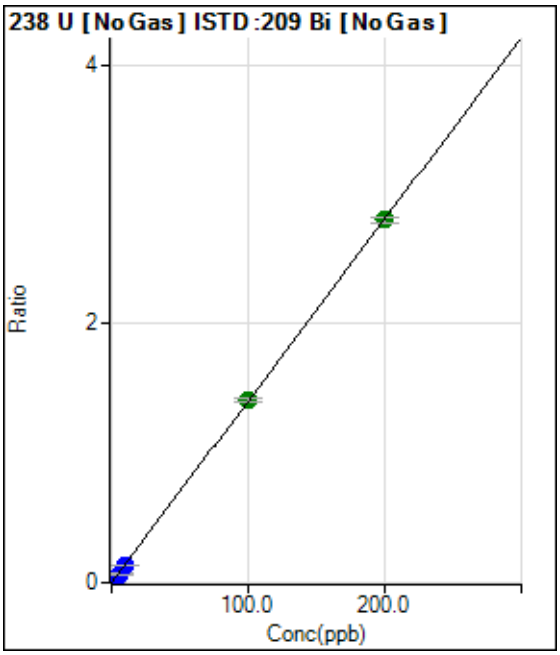
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1163.38	0.0006	P	3.8
2	☐	2.000	1.872	54757.91	0.0262	P	1.3
3	☐	5.000	4.837	139182.79	0.0668	P	3.3
4	☐	10.000	9.710	282936.43	0.1336	P	2.3
5	☐	100.000	98.920	2810359.40	1.3559	A	1.8
6	☐	200.000	200.560	5656282.78	2.7486	A	2.2

y = 0.0137 * x + 5.6210E-004
R = 1.0000
DL = 0.004726
BEC = 0.04102

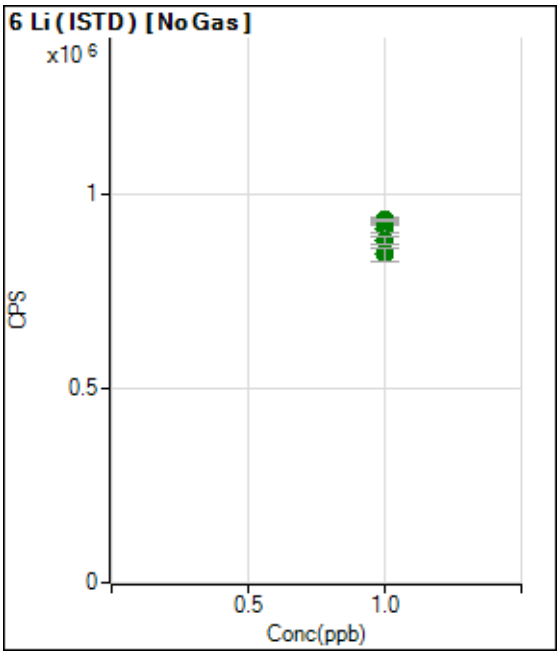
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Min Conc: <None>



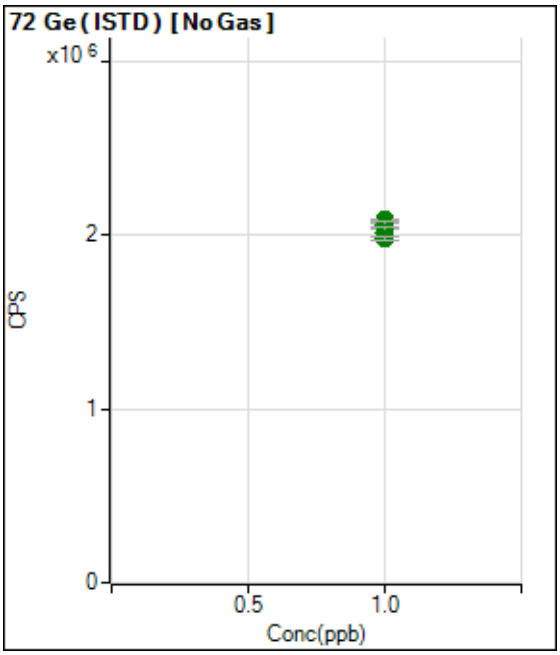
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	56.67	0.0000	P	68.7
2	☐	2.000	1.821	53467.02	0.0256	P	1.9
3	☐	5.000	4.691	137193.24	0.0659	P	4.6
4	☐	10.000	9.421	280152.63	0.1323	P	3.0
5	☐	100.000	100.641	2929770.58	1.4132	A	2.6
6	☐	200.000	199.718	5771433.25	2.8044	A	1.5

y = 0.0140 * x + 2.7612E-005
R = 1.0000
DL = 0.004052
BEC = 0.001966

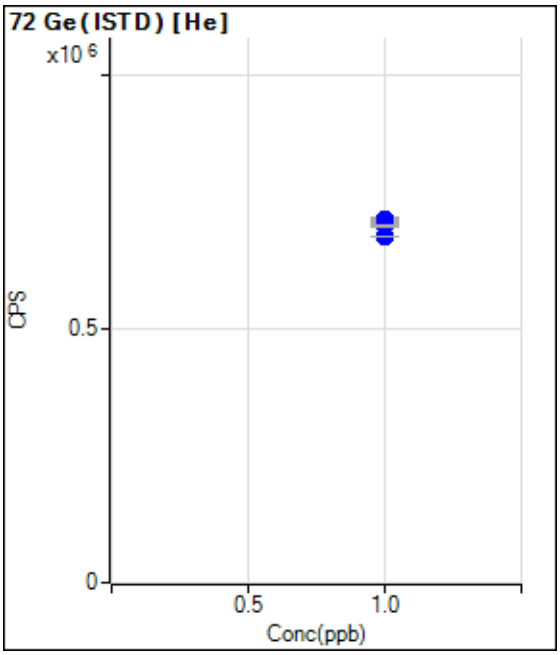
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Min Conc: <None>



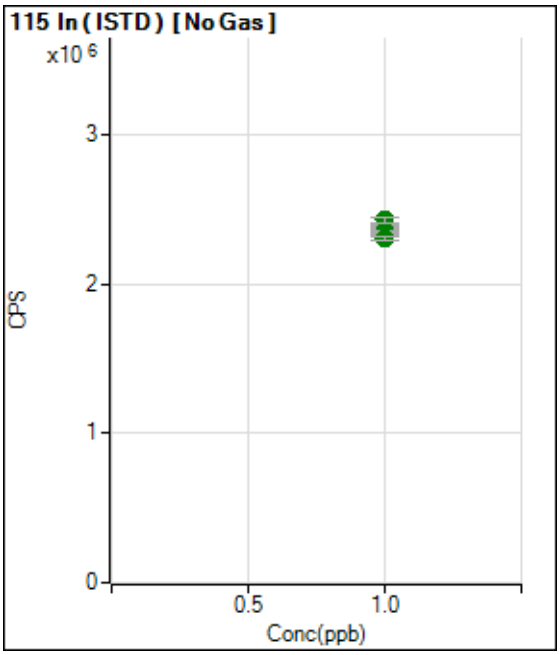
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		931764.05		A	1.9
2	☐	1.000		919641.37		A	0.7
3	☐	1.000		910315.15		A	2.7
4	☐	1.000		930654.78		A	0.3
5	☐	1.000		878633.32		A	1.9
6	☐	1.000		843606.75		A	4.3



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2088541.12		A	0.6
2	☐	1.000		2071565.54		A	0.5
3	☐	1.000		2081608.46		A	1.1
4	☐	1.000		2057208.46		A	2.5
5	☐	1.000		2020187.21		A	2.5
6	☐	1.000		1980948.72		A	0.8

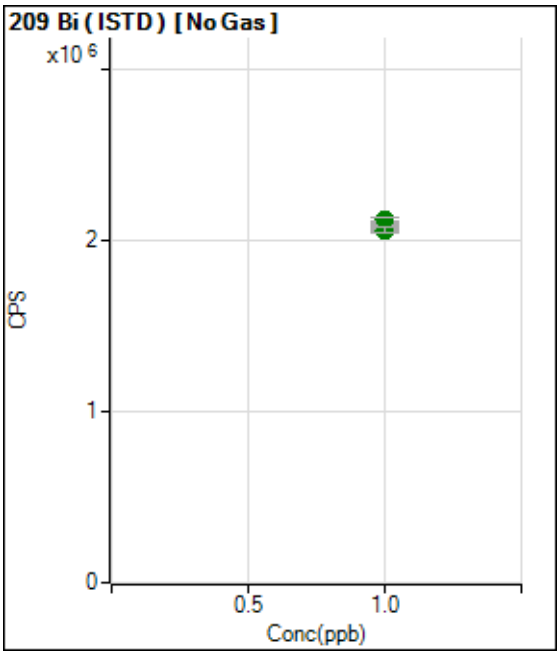


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		713484.34		P	0.9
2	☐	1.000		710825.67		P	0.2
3	☐	1.000		711451.11		P	0.7
4	☐	1.000		708905.59		P	1.0
5	☐	1.000		701575.93		P	0.4
6	☐	1.000		681191.37		P	0.3



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2355410.06		A	1.4
2	☐	1.000		2397214.76		A	0.7
3	☐	1.000		2401881.85		A	0.3
4	☐	1.000		2433841.52		A	1.4
5	☐	1.000		2352213.73		A	0.7
6	☐	1.000		2309617.41		A	0.7

Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2070771.43		A	2.3
2	☐	1.000		2088803.77		A	1.4
3	☐	1.000		2083659.50		A	2.8
4	☐	1.000		2118234.19		A	1.9
5	☐	1.000		2072859.66		A	1.1
6	☐	1.000		2058329.40		A	1.7

Sample Report

Sample Table

Sample Name	LLICV2
Data File Name	016LCV2.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:22:17-06:00
Sample Type	LLCCV2
Dilution	1
Comment	
ISTD Ref FileName	008CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	1.753	1.753	1.89	77579	0.00	2	
Be	9	1	No Gas	1.905	1.905	4.07	6210	0.03	2	
V	51	2	He	1.762	1.762	3.21	12782	0.01	2	
Cr	52	2	He	1.950	1.950	3.37	15532	0.01	2	
Fe	56	2	He	199.985	199.985	2.57	1088836	0.02	200	
Se	78	2	He	1.674	1.674	26.07	437	0.38	2	
As	75	2	He	1.909	1.909	7.58	1941	0.10	2	
Ca	44	2	He	200.326	200.326	2.34	8693	2.30	200	
Na	23	2	He	187.620	187.620	2.86	286164	0.07	200	
Mg	24	2	He	198.466	198.466	2.33	110546	0.18	200	
K	39	2	He	186.001	186.001	1.87	313559	0.06	200	
Mn	55	2	He	1.766	1.766	3.63	12079	0.01	2	
Co	59	2	He	1.854	1.854	3.08	14478	0.01	2	
Ni	60	2	He	1.903	1.903	4.67	3637	0.05	2	
Cu	63	2	He	1.880	1.880	3.20	10224	0.02	2	
Zn	66	2	He	2.079	2.079	1.99	2490	0.08	2	
Al	27	2	He	2.062	2.062	22.34	1777	0.12	2	
B	11	1	No Gas	16.300	16.300	4.67	43957	0.04	10	NewName Main CR1 Failed
Al	27	1	No Gas	2.092	2.092	4.55	51562	0.00	2	
Si	28	1	No Gas	11.070	11.070	9.91	396619	0.00	10	
Ag	107	1	No Gas	1.922	1.922	0.67	23651	0.01	2	
Cd	111	1	No Gas	1.986	1.986	2.90	4871	0.04	2	
Sr	88	1	No Gas	1.964	1.964	1.85	48050	0.00	2	
Mo	95	1	No Gas	2.002	2.002	3.28	9440	0.02	2	
Sn	118	1	No Gas	2.004	2.004	1.22	16354	0.01	2	
Sb	121	1	No Gas	1.987	1.987	1.15	21177	0.01	2	
Ba	137	1	No Gas	2.020	2.020	4.13	7949	0.03	2	
Tl	205	1	No Gas	1.941	1.941	0.56	41720	0.00	2	
Tl	203	1	No Gas	1.975	1.975	3.81	17573	0.01	2	
Pb	208	1	No Gas	1.973	1.973	1.30	58361	0.00	2	
U	238	1	No Gas	1.914	1.914	0.90	56899	0.00	2	
Ca	43	2	He	187.553	187.553	22.35	483	38.80	200	
Sb	121	2	He	2.068	2.068	3.49	12593	0.02	2	
Ti	47	2	He	1.802	1.802	14.16	400	0.45	200	
Cu	63	1	No Gas	1.966	1.966	1.17	20209	0.01	2	
Se	82	1	No Gas	3.023	3.023	15.37	449	0.67	2	NewName Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	912990	1.95	931764	97.99	70	120	
Ge	72	2	He	711604	0.75	713484	99.74	70	120	
Ge	72	1	No Gas	2062546	0.88	2088541	98.76	70	120	
In	115	1	No Gas	2383023	1.66	2355410	101.17	70	120	
Bi	209	1	No Gas	2115167	0.40	2070771	102.14	70	120	

Sample Report

Sample Table

Sample Name	LLICV5
Data File Name	017LCV5.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:24:15-06:00
Sample Type	LLCCV5
Dilution	1
Comment	
ISTD Ref FileName	008CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	4.620	4.620	8.92	110197	0.00	5	
Be	9	1	No Gas	4.671	4.671	6.14	15135	0.03	5	
V	51	2	He	4.708	4.708	0.16	27552	0.02	5	
Cr	52	2	He	4.889	4.889	0.73	31613	0.02	5	
Fe	56	2	He	503.683	503.683	1.39	2700638	0.02	500	
Se	78	2	He	4.695	4.695	9.18	727	0.65	5	
As	75	2	He	4.926	4.926	1.46	4634	0.11	5	
Ca	44	2	He	492.534	492.534	1.44	20415	2.41	500	
Na	23	2	He	499.899	499.899	0.28	561343	0.09	500	
Mg	24	2	He	513.359	513.359	0.15	283521	0.18	500	
K	39	2	He	487.645	487.645	0.37	556931	0.09	500	
Mn	55	2	He	4.822	4.822	1.89	25805	0.02	5	
Co	59	2	He	4.865	4.865	1.71	37626	0.01	5	
Ni	60	2	He	5.154	5.154	2.52	9584	0.05	5	
Cu	63	2	He	5.018	5.018	3.07	24693	0.02	5	
Zn	66	2	He	4.982	4.982	3.45	5575	0.09	5	
Al	27	2	He	5.099	5.099	11.78	2890	0.18	5	
B	11	1	No Gas	26.869	26.869	3.56	62766	0.04	25	
Al	27	1	No Gas	5.047	5.047	1.81	84124	0.01	5	
Si	28	1	No Gas	25.869	25.869	4.54	482349	0.01	25	
Ag	107	1	No Gas	4.846	4.846	0.49	59614	0.01	5	
Cd	111	1	No Gas	4.972	4.972	1.81	12246	0.04	5	
Sr	88	1	No Gas	4.884	4.884	0.64	118673	0.00	5	
Mo	95	1	No Gas	4.741	4.741	2.22	22436	0.02	5	
Sn	118	1	No Gas	4.776	4.776	2.26	37514	0.01	5	
Sb	121	1	No Gas	4.698	4.698	3.53	49477	0.01	5	
Ba	137	1	No Gas	4.906	4.906	1.30	19248	0.03	5	
Tl	205	1	No Gas	4.749	4.749	0.73	102687	0.00	5	
Tl	203	1	No Gas	4.721	4.721	1.71	42279	0.01	5	
Pb	208	1	No Gas	4.819	4.819	0.94	142178	0.00	5	
U	238	1	No Gas	4.609	4.609	0.54	138239	0.00	5	
Ca	43	2	He	518.531	518.531	10.27	1273	40.72	500	
Sb	121	2	He	4.850	4.850	0.09	29046	0.02	5	
Ti	47	2	He	5.045	5.045	11.64	1077	0.47	5	
Cu	63	1	No Gas	5.027	5.027	0.25	47109	0.01	5	
Se	82	1	No Gas	5.295	5.295	14.65	805	0.66	5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	911672	3.29	931764	97.84	70	120	
Ge	72	2	He	706573	1.05	713484	99.03	70	120	
Ge	72	1	No Gas	2057379	1.86	2088541	98.51	70	120	

Sample Report

In	115	1	No Gas	2401252	2.06	2355410	101.95	70	120	
Bi	209	1	No Gas	2135135	1.50	2070771	103.11	70	120	

Initial Calibration Blank (ICB) Report

Sample Table

Sample Name	ICB
Data File Name	018_ICB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:26:13-06:00
Sample Type	ICB
Dilution	1
Comment	
ISTD Ref File Name	008CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Li	7	1	No Gas	-0.003	-4213.2	57380	0.4	0.5	
Be	9	1	No Gas	0.002	408.0	40	57.3	0.5	
V	51	2	He	-0.047	-57.0	3588	3.8	2.5	
Cr	52	2	He	-0.016	-468.4	4634	9.7	2.5	
Fe	56	2	He	0.213	21.9	16026	1.4	100	
Se	78	2	He	-0.431	-39.8	231	6.3	1	
As	75	2	He	-0.016	-60.2	202	4.1	2.5	
Ca	44	2	He	6.781	45.1	833	14.0	100	
Na	23	2	He	-14.940	-6.8	105170	1.7	100	
Mg	24	2	He	0.545	38.3	563	20.7	100	
K	39	2	He	-7.650	-24.4	154857	0.0	100	
Mn	55	2	He	-0.246	-18.5	2914	6.8	2.5	
Co	59	2	He	0.005	79.3	103	31.1	2.5	
Ni	60	2	He	0.020	39.7	153	10.0	2.5	
Cu	63	2	He	-0.043	-10.7	1260	1.6	1	
Zn	66	2	He	-0.052	-54.3	197	15.5	2.5	
Al	27	2	He	1.875	32.6	1707	13.5	5	
B	11	1	No Gas	3.078	8.7	20283	0.7	0.5	ICB Main CR1 Failed
Al	27	1	No Gas	1.805	4.1	49632	1.7	5	
Si	28	1	No Gas	-1.698	-29.3	329912	0.6	10	
Ag	107	1	No Gas	0.007	32.8	390	6.8	2.5	
Cd	111	1	No Gas	0.000	-2261.1	23	65.5	1	
Sr	88	1	No Gas	0.026	22.0	1787	7.5	2.5	
Mo	95	1	No Gas	0.012	43.0	120	22.0	2.5	
Sn	118	1	No Gas	-0.006	-290.8	1223	8.3	5	
Sb	121	1	No Gas	0.164	12.0	2104	10.2	2.5	
Ba	137	1	No Gas	0.027	35.8	253	14.9	2.5	
Tl	205	1	No Gas	0.008	40.9	410	17.1	1	
Tl	203	1	No Gas	0.019	47.4	243	31.1	1	
Pb	208	1	No Gas	0.013	12.1	1573	3.7	2.5	
U	238	1	No Gas	0.006	10.3	250	6.9	2.5	
Ca	43	2	He	6.988	71.3	47	24.7	100	
Sb	121	2	He	0.165	8.4	1200	7.4	2.5	
Ti	47	2	He	-0.063	-43.9	7	86.6	2.5	
Se	82	1	No Gas	-0.426	-210.8	-98	-148.7	1	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	912446	2.04	931764	97.93	70	120	
Ge	72	2	He	711957	0.95	713484	99.79	70	120	
Ge	72	1	No Gas	2115901	0.88	2088541	101.31	70	120	
In	115	1	No Gas	2400672	1.86	2355410	101.92	70	120	
Bi	209	1	No Gas	2119876	1.16	2070771	102.37	70	120	

Interference Check Solution A (ICS-A) Report

Sample Table

Sample Name	ICSA
Data File Name	020ICSA.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:38:57-06:00
Sample Type	ICSA
Dilution	1
Comment	
ISTD Ref File Name	008CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Li	7	1	No Gas	0.641	24.0	61242	2.4	0	ICSA Main CR1 Failed
Be	9	1	No Gas	-0.004	-79.5	20	50.0	0	ICSA Main CR1 Failed
V	51	2	He	0.257	13.8	4844	3.4	0	ICSA Main CR1 Failed
Cr	52	2	He	2.464	2.3	17358	1.8	0	ICSA Main CR1 Failed
Fe	56	2	He	98951.616	1.2	501766073	1.4	0	
Se	78	2	He	-0.102	-316.0	249	11.8	0	ICSA Main CR1 Failed
As	75	2	He	0.094	51.6	284	14.7	0	ICSA Main CR1 Failed
Ca	44	2	He	98847.565	0.8	3790516	1.0	0	
Na	23	2	He	99433.184	0.6	84028864	0.8	0	
Mg	24	2	He	97883.549	1.6	51354621	1.4	0	
K	39	2	He	97206.855	0.7	75397469	0.7	0	
Mn	55	2	He	0.680	11.1	6732	4.7	0	ICSA Main CR1 Failed
Co	59	2	He	0.212	11.0	1617	10.4	0	ICSA Main CR1 Failed
Ni	60	2	He	0.517	5.8	1013	5.0	0	ICSA Main CR1 Failed
Cu	63	2	He	0.544	8.5	3771	5.2	0	ICSA Main CR1 Failed
Zn	66	2	He	1.084	15.3	1340	12.4	0	ICSA Main CR1 Failed
Al	27	2	He	99672.292	0.8	35214759	1.1	0	
B	11	1	No Gas	-0.247	-68.3	13557	2.2	0	ICSA Main CR1 Failed
Al	27	1	No Gas	93836.854	1.8	1007911398	0.8	0	
Si	28	1	No Gas	19.891	8.5	434198	0.4	0	ICSA Main CR1 Failed
Ag	107	1	No Gas	0.305	5.9	3784	7.8	0	ICSA Main CR1 Failed
Cd	111	1	No Gas	2.148	2.3	4964	4.2	0	
Sr	88	1	No Gas	1.191	1.4	27893	2.3	0	ICSA Main CR1 Failed
Mo	95	1	No Gas	2059.949	2.8	9089594	0.6	0	
Sn	118	1	No Gas	0.060	56.0	1610	12.6	0	ICSA Main CR1 Failed
Sb	121	1	No Gas	0.160	5.7	1944	6.6	0	ICSA Main CR1 Failed
Ba	137	1	No Gas	0.430	6.0	1703	3.3	0	ICSA Main CR1 Failed
Tl	205	1	No Gas	0.002	47.1	260	7.7	0	ICSA Main CR1 Failed
Tl	203	1	No Gas	0.008	51.4	140	24.7	0	ICSA Main CR1 Failed
Pb	208	1	No Gas	0.080	7.0	3277	4.8	0	ICSA Main CR1 Failed
U	238	1	No Gas	0.003	28.8	143	17.6	0	ICSA Main CR1 Failed
Ca	43	2	He	95008.337	0.5	216873	0.7	0	
Sb	121	2	He	0.151	8.2	1053	6.5	0	ICSA Main CR1 Failed
Ti	47	2	He	2058.823	1.0	409835	1.0	0	
Se	82	1	No Gas	0.319	129.5	22	293.6	0	ICSA Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	862664	0.46	931764	92.58	70	120	
Ge	72	2	He	671826	0.24	713484	94.16	70	120	
Ge	72	1	No Gas	1997312	1.88	2088541	95.63	70	120	
In	115	1	No Gas	2245750	2.39	2355410	95.34	70	120	
Bi	209	1	No Gas	1978761	0.33	2070771	95.56	70	120	

Interference Check Solution AB (ICS-AB) Report

Sample Table

Sample Name	ICSAB
Data File Name	021ICSB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:40:57-06:00
Sample Type	ICSB
Dilution	1
Comment	
ISTD Ref File Name	008CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Li	7	1	No Gas	91.285	3.149	1049524	1.13	100	91.3	180	120	ICSB Main CR1 Failed
Be	9	1	No Gas	88.770	2.138	273513	0.75	100	88.8	80	120	
V	51	2	He	94.236	0.308	458973	0.34	100	94.2	80	120	
Cr	52	2	He	96.300	1.013	512492	0.77	100	96.3	80	120	
Fe	56	2	He	105616.602	0.650	539481739	1.09	100	105616.6	80	120	ICSB Main CR1 Failed
Se	78	2	He	98.378	0.983	9392	1.39	100	98.4	80	120	
As	75	2	He	97.123	0.162	83648	0.46	100	97.1	80	120	
Ca	44	2	He	105622.428	0.082	4079886	0.48	100	105622.4	80	120	ICSB Main CR1 Failed
Na	23	2	He	105419.358	0.753	89731045	0.58	100	105419.4	80	120	ICSB Main CR1 Failed
Mg	24	2	He	103371.957	1.048	54630223	0.67	100	103372.0	80	120	ICSB Main CR1 Failed
K	39	2	He	103521.200	1.685	80869114	1.25	100	103521.2	80	120	ICSB Main CR1 Failed
Mn	55	2	He	97.015	1.256	423916	0.81	100	97.0	80	120	
Co	59	2	He	92.704	0.277	685625	0.55	100	92.7	80	120	
Ni	60	2	He	95.348	1.094	167872	1.38	100	95.3	80	120	
Cu	63	2	He	95.316	0.756	424178	1.17	100	95.3	80	120	
Zn	66	2	He	96.396	0.233	98895	0.67	100	96.4	80	120	
Al	27	2	He	96912.653	0.562	34489377	0.13	100	96912.7	80	120	ICSB Main CR1 Failed
B	11	1	No Gas	450.795	1.237	781105	1.67	100	450.8	80	120	
Al	27	1	No Gas	92967.726	0.871	986391052	0.91	100	92967.7	80	120	ICSB Main CR1 Failed
Si	28	1	No Gas	493.356	0.384	3090607	1.39	100	493.4	80	120	
Ag	107	1	No Gas	89.984	1.499	1047900	0.68	100	90.0	80	120	
Cd	111	1	No Gas	97.738	2.426	228650	1.29	100	97.7	80	120	
Sr	88	1	No Gas	100.528	2.810	2302038	2.11	100	100.5	80	120	
Mo	95	1	No Gas	2066.194	1.739	9278014	0.77	100	2066.2	80	120	ICSB Main CR1 Failed
Sn	118	1	No Gas	94.581	2.370	684236	0.97	100	94.6	80	120	
Sb	121	1	No Gas	93.796	1.160	941391	0.19	100	93.8	80	120	
Ba	137	1	No Gas	97.202	2.090	360145	0.78	100	97.2	80	120	
Tl	205	1	No Gas	97.713	1.210	1995993	0.42	100	97.7	80	120	
Tl	203	1	No Gas	93.738	1.066	793549	0.97	100	93.7	80	120	
Pb	208	1	No Gas	96.091	0.874	2662597	0.64	100	96.1	80	120	
U	238	1	No Gas	101.572	0.729	2883044	0.58	100	101.6	80	120	
Ca	43	2	He	102678.172	0.464	236089	0.20	100	102678.2	80	120	ICSB Main CR1 Failed
Sb	121	2	He	95.267	0.867	542774	0.44	100	95.3	80	120	
Ti	47	2	He	2089.332	0.160	418950	0.30	100	2089.3	80	120	ICSB Main CR1 Failed
Cu	63	1	No Gas	92.990	1.223	787690	0.15	100	93.0	80	120	
Se	82	1	No Gas	97.714	1.740	14731	1.95	100	97.7	80	120	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	867931	2.90	931764	93.15	70	120	
Ge	72	2	He	676743	0.44	713484	94.85	70	120	
Ge	72	1	No Gas	1972621	1.25	2088541	94.45	70	120	
In	115	1	No Gas	2284729	1.51	2355410	97.00	70	120	
Bi	209	1	No Gas	2021558	1.31	2070771	97.62	70	120	

Calibration Blank Report

Sample Table

Sample Name	CAL BLK
Data File Name	155CALB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T19:51:17-06:00
Sample Type	CalBlk
Level	1
Dilution	1
Comment	

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Li	7	1	No Gas	50552	0.00
Be	9	1	No Gas	12	561.13
V	51	2	He	4103	0.05
Cr	52	2	He	3804	0.11
Fe	56	2	He	13430	0.01
Se	78	2	He	191	5.19
As	75	2	He	318	2.88
Ca	44	2	He	547	3.35
Na	23	2	He	113314	0.00
Mg	24	2	He	443	2.06
K	39	2	He	128419	0.00
Mn	55	2	He	1767	0.54
Co	59	2	He	33	226.50
Ni	60	2	He	90	0.00
Cu	63	2	He	983	0.39
Zn	66	2	He	267	4.52
Al	27	2	He	910	0.64
B	11	1	No Gas	10959	0.03
Al	27	1	No Gas	27811	0.00
Si	28	1	No Gas	244693	0.00
Ag	107	1	No Gas	160	17.03
Cd	111	1	No Gas	13	649.52
Sr	88	1	No Gas	1343	0.74
Mo	95	1	No Gas	50	69.28
Sn	118	1	No Gas	1323	0.58
Sb	121	1	No Gas	430	4.62
Ba	137	1	No Gas	220	5.47
Tl	205	1	No Gas	87	60.03
Tl	203	1	No Gas	53	123.46
Pb	208	1	No Gas	657	2.32
U	238	1	No Gas	40	108.25
Ca	43	2	He	23	280.57
Sb	121	2	He	213	10.38
Ti	47	2	He	13	324.76
Cu	63	1	No Gas	2377	0.19

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD

Calibration Blank Report

Li	6	1	No Gas	851397	1.05
Ge	72	2	He	694065	0.33
Ge	72	1	No Gas	2139408	0.40
In	115	1	No Gas	2719437	0.96

Calibration Blank Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Bi	209	1	No Gas	2536806	2.28

Calibration Standard Report

Sample Table

Sample Name	2/10/200
Data File Name	156CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T19:53:15-06:00
Sample Type	CalStd
Level	2
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	No Gas	5026	0.06
V	51	2	He	13506	0.00
Cr	52	2	He	14995	0.02
Fe	56	2	He	1082643	0.00
Se	78	2	He	388	0.61
As	75	2	He	1926	0.09
Ca	44	2	He	7966	0.04
Na	23	2	He	286337	0.00
Mg	24	2	He	108913	0.00
K	39	2	He	278995	0.00
Mn	55	2	He	10671	0.03
Co	59	2	He	14688	0.02
Ni	60	2	He	3947	0.13
Cu	63	2	He	10428	0.06
Zn	66	2	He	2214	0.03
Al	27	2	He	2346	2.13
B	11	1	No Gas	25700	0.00
Al	27	1	No Gas	50609	0.00
Si	28	1	No Gas	306588	0.00
Ag	107	1	No Gas	25946	0.00
Cd	111	1	No Gas	5385	0.08
Sr	88	1	No Gas	52359	0.00
Mo	95	1	No Gas	10147	0.02
Sn	118	1	No Gas	17993	0.03
Sb	121	1	No Gas	22526	0.01
Ba	137	1	No Gas	8826	0.02
Tl	205	1	No Gas	48662	0.00
Tl	203	1	No Gas	20090	0.01
Pb	208	1	No Gas	67860	0.00
U	238	1	No Gas	68619	0.00
Ca	43	2	He	473	4.22
Sb	121	2	He	12029	0.00
Cu	63	1	No Gas	19484	0.01

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	844098	1.26	851397	99.14	70	120	
Ge	72	2	He	698155	0.54	694065	100.59	70	120	
Ge	72	1	No Gas	2145638	0.93	2139408	100.29	70	120	

Calibration Standard Report

In	115	1	No Gas	2724330	1.13	2719437	100.18	70	120	
Bi	209	1	No Gas	2556187	0.93	2536806	100.76	70	120	

Calibration Standard Report

Sample Table

Sample Name	5/25/500
Data File Name	157CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T19:55:13-06:00
Sample Type	CalStd
Level	3
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	No Gas	12452	0.01
V	51	2	He	27767	0.00
Cr	52	2	He	30979	0.01
Fe	56	2	He	2694485	0.00
Se	78	2	He	681	0.55
As	75	2	He	4337	0.05
Ca	44	2	He	19534	0.01
Na	23	2	He	555136	0.00
Mg	24	2	He	274259	0.00
K	39	2	He	507812	0.00
Mn	55	2	He	23988	0.01
Co	59	2	He	37529	0.01
Ni	60	2	He	9390	0.01
Cu	63	2	He	24472	0.01
Zn	66	2	He	5401	0.13
Al	27	2	He	2914	0.31
B	11	1	No Gas	48130	0.00
Al	27	1	No Gas	86451	0.00
Si	28	1	No Gas	387339	0.00
Ag	107	1	No Gas	64574	0.00
Cd	111	1	No Gas	13651	0.02
Sr	88	1	No Gas	131242	0.00
Mo	95	1	No Gas	25398	0.00
Sn	118	1	No Gas	43522	0.00
Sb	121	1	No Gas	57667	0.00
Ba	137	1	No Gas	21999	0.01
Tl	205	1	No Gas	123716	0.00
Tl	203	1	No Gas	52126	0.00
Pb	208	1	No Gas	171927	0.00
U	238	1	No Gas	171189	0.00
Ca	43	2	He	1203	1.66
Sb	121	2	He	30285	0.00
Cu	63	1	No Gas	46824	0.01

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	833751	1.41	851397	97.93	70	120	
Ge	72	2	He	705355	0.67	694065	101.63	70	120	
Ge	72	1	No Gas	2144715	0.80	2139408	100.25	70	120	

Calibration Standard Report

In	115	1	No Gas	2717717	0.31	2719437	99.94	70	120	
Bi	209	1	No Gas	2593318	1.20	2536806	102.23	70	120	

Calibration Standard Report

Sample Table

Sample Name	10/50/100
Data File Name	158CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T19:57:11-06:00
Sample Type	CalStd
Level	4
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	No Gas	24737	0.00
V	51	2	He	51660	0.00
Cr	52	2	He	58521	0.00
Fe	56	2	He	5386461	0.00
Se	78	2	He	1108	0.58
As	75	2	He	8458	0.03
Ca	44	2	He	38407	0.00
Na	23	2	He	986188	0.00
Mg	24	2	He	549797	0.00
K	39	2	He	900013	0.00
Mn	55	2	He	46145	0.01
Co	59	2	He	74587	0.00
Ni	60	2	He	18820	0.00
Cu	63	2	He	48530	0.00
Zn	66	2	He	10574	0.04
Al	27	2	He	4547	0.09
B	11	1	No Gas	86603	0.00
Al	27	1	No Gas	141655	0.00
Si	28	1	No Gas	541457	0.00
Ag	107	1	No Gas	132276	0.00
Cd	111	1	No Gas	27923	0.00
Sr	88	1	No Gas	261107	0.00
Mo	95	1	No Gas	50606	0.00
Sn	118	1	No Gas	85860	0.00
Sb	121	1	No Gas	115193	0.00
Ba	137	1	No Gas	44085	0.00
Tl	205	1	No Gas	251697	0.00
Tl	203	1	No Gas	105301	0.00
Pb	208	1	No Gas	347424	0.00
U	238	1	No Gas	344517	0.00
Ca	43	2	He	2147	0.18
Sb	121	2	He	60292	0.00
Cu	63	1	No Gas	92141	0.00

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	834919	0.82	851397	98.06	70	120	
Ge	72	2	He	698779	1.08	694065	100.68	70	120	
Ge	72	1	No Gas	2124268	1.19	2139408	99.29	70	120	

Calibration Standard Report

In	115	1	No Gas	2737982	0.67	2719437	100.68	70	120	
Bi	209	1	No Gas	2524223	0.84	2536806	99.50	70	120	

Calibration Standard Report

Sample Table

Sample Name	100/500/10K
Data File Name	159CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T19:59:09-06:00
Sample Type	CalStd
Level	5
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	No Gas	251783	0.00
V	51	2	He	482915	0.00
Cr	52	2	He	535351	0.00
Fe	56	2	He	52787539	0.00
Se	78	2	He	9485	0.02
As	75	2	He	83221	0.00
Ca	44	2	He	381812	0.00
Na	23	2	He	8630568	0.00
Mg	24	2	He	5238421	0.00
K	39	2	He	7644616	0.00
Mn	55	2	He	446423	0.00
Co	59	2	He	739722	0.00
Ni	60	2	He	182308	0.00
Cu	63	2	He	468288	0.00
Zn	66	2	He	104691	0.00
Al	27	2	He	35780	0.00
B	11	1	No Gas	749403	0.00
Al	27	1	No Gas	1095714	0.00
Si	28	1	No Gas	2966472	0.00
Ag	107	1	No Gas	1328584	0.00
Cd	111	1	No Gas	275813	0.00
Sr	88	1	No Gas	2644518	0.00
Mo	95	1	No Gas	504256	0.00
Sn	118	1	No Gas	847409	0.00
Sb	121	1	No Gas	1161695	0.00
Ba	137	1	No Gas	437151	0.00
Tl	205	1	No Gas	2606829	0.00
Tl	203	1	No Gas	1053304	0.00
Pb	208	1	No Gas	3551009	0.00
U	238	1	No Gas	3700484	0.00
Ca	43	2	He	22789	0.02
Sb	121	2	He	612149	0.00
Cu	63	1	No Gas	878314	0.00

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	788191	2.07	851397	92.58	70	120	
Ge	72	2	He	689128	0.98	694065	99.29	70	120	
Ge	72	1	No Gas	2092023	0.86	2139408	97.79	70	120	

Calibration Standard Report

In	115	1	No Gas	2636128	2.20	2719437	96.94	70	120	
Bi	209	1	No Gas	2526931	0.57	2536806	99.61	70	120	

Calibration Standard Report

Sample Table

Sample Name	200/1000/20K
Data File Name	160CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T20:01:02-06:00
Sample Type	CalStd
Level	6
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	No Gas	490819	0.00
V	51	2	He	958687	0.00
Cr	52	2	He	1073166	0.00
Fe	56	2	He	102704068	0.00
Se	78	2	He	18505	0.01
As	75	2	He	163861	0.00
Ca	44	2	He	757009	0.00
Na	23	2	He	17034505	0.00
Mg	24	2	He	10162238	0.00
K	39	2	He	14945589	0.00
Mn	55	2	He	876514	0.00
Co	59	2	He	1526007	0.00
Ni	60	2	He	359532	0.00
Cu	63	2	He	920882	0.00
Zn	66	2	He	203722	0.00
Al	27	2	He	67346	0.00
B	11	1	No Gas	1497279	0.00
Al	27	1	No Gas	2115046	0.00
Si	28	1	No Gas	5510487	0.00
Ag	107	1	No Gas	2591097	0.00
Cd	111	1	No Gas	538979	0.00
Sr	88	1	No Gas	5225903	0.00
Mo	95	1	No Gas	1008880	0.00
Sn	118	1	No Gas	1676552	0.00
Sb	121	1	No Gas	2295859	0.00
Ba	137	1	No Gas	871178	0.00
Tl	205	1	No Gas	5096070	0.00
Tl	203	1	No Gas	2120173	0.00
Pb	208	1	No Gas	6980569	0.00
U	238	1	No Gas	7191374	0.00
Ca	43	2	He	43355	0.00
Sb	121	2	He	1262335	0.00
Cu	63	1	No Gas	1774058	0.00

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	771891	3.47	851397	90.66	70	120	
Ge	72	2	He	678518	0.97	694065	97.76	70	120	
Ge	72	1	No Gas	2076151	0.87	2139408	97.04	70	120	

Calibration Standard Report

In	115	1	No Gas	2614363	1.42	2719437	96.14	70	120	
Bi	209	1	No Gas	2488386	1.14	2536806	98.09	70	120	

Initial Calibration Verification (ICV) Report

Sample Table

Sample Name	ICCV
Data File Name	162_ICV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T20:04:50-06:00
Sample Type	ICV
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Li	7	1	No Gas	100.499	4.755	1030151	2.34	100	100.5	90	110	
Be	9	1	No Gas	101.478	2.821	259360	0.21	100	101.5	90	110	
V	51	2	He	100.363	1.480	495379	0.94	100	100.4	90	110	
Cr	52	2	He	101.347	1.597	558541	0.80	100	101.3	90	110	
Fe	56	2	He	10051.522	1.188	53197961	0.21	10000	100.5	90	110	
Se	78	2	He	102.624	0.814	9854	1.57	100	102.6	90	110	
As	75	2	He	104.062	1.010	87767	1.03	100	104.1	90	110	
Ca	44	2	He	9844.914	1.513	382752	0.66	10000	98.4	90	110	
Na	23	2	He	9967.199	1.040	8769640	0.61	10000	99.7	90	110	
Mg	24	2	He	10101.210	0.855	5293429	0.74	10000	101.0	90	110	
K	39	2	He	9884.433	1.605	7656326	0.46	10000	98.8	90	110	
Mn	55	2	He	103.928	1.412	469171	1.16	100	103.9	90	110	
Co	59	2	He	99.735	1.698	775111	0.47	100	99.7	90	110	
Ni	60	2	He	103.311	1.013	190910	0.34	100	103.3	90	110	
Cu	63	2	He	102.667	1.144	486514	0.33	100	102.7	90	110	
Zn	66	2	He	104.085	1.456	109345	0.48	100	104.1	90	110	
Al	27	2	He	107.232	4.226	37792	3.41	100	107.2	90	110	
B	11	1	No Gas	480.688	2.559	750506	1.79	500	96.1	90	110	
Al	27	1	No Gas	109.599	3.578	1201459	2.99	100	109.6	90	110	
Si	28	1	No Gas	513.164	1.034	3025045	0.67	500	102.6	90	110	
Ag	107	1	No Gas	100.467	1.790	1335665	1.97	100	100.5	90	110	
Cd	111	1	No Gas	101.701	0.928	281084	0.48	100	101.7	90	110	
Sr	88	1	No Gas	98.606	1.347	2637067	1.21	100	98.6	90	110	
Mo	95	1	No Gas	97.868	0.770	503929	0.71	100	97.9	90	110	
Sn	118	1	No Gas	98.716	0.461	847229	1.11	100	98.7	90	110	
Sb	121	1	No Gas	101.258	2.433	1189491	1.68	100	101.3	90	110	
Ba	137	1	No Gas	101.982	0.768	453916	0.18	100	102.0	90	110	
Tl	205	1	No Gas	106.523	0.546	2734894	0.08	100	106.5	90	110	
Tl	203	1	No Gas	104.534	0.830	1110303	0.38	100	104.5	90	110	
Pb	208	1	No Gas	103.069	1.260	3621625	1.64	100	103.1	90	110	
U	238	1	No Gas	105.845	1.782	3840081	2.19	100	105.8	90	110	
Ca	43	2	He	10348.811	1.456	23233	1.79	10000	103.5	90	110	
Sb	121	2	He	98.490	1.887	633243	1.11	100	98.5	90	110	
Ti	47	2	He	99.210	2.656	20329	3.55	100	99.2	90	110	
Cu	63	1	No Gas	100.213	0.455	906763	0.30	100	100.2	90	110	
Se	82	1	No Gas	98.911	3.573	16529	3.66	100	98.9	90	110	

QC ISTD Table

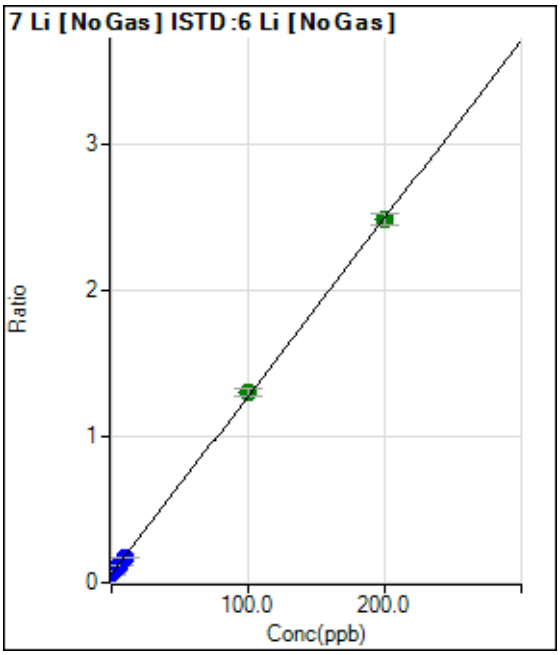
Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	803175	2.74	851397	94.34	70	120	
Ge	72	2	He	697580	1.34	694065	100.51	70	120	
Ge	72	1	No Gas	2122884	0.75	2139408	99.23	70	120	
In	115	1	No Gas	2673264	0.66	2719437	98.30	70	120	
Bi	209	1	No Gas	2503863	0.46	2536806	98.70	70	120	

Calibration for 162_ICV.d

Batch Folder: C:\Agilent\ICPMH\1\DATA\121521A.b\
Analysis File: 121521A.batch.bin
DA Date-Time: 12/15/2021 8:05:33 PM
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

Level	Standard Data File	Sample Name	Acq. Date-Time
1	155CALB.d	CAL BLK	12/15/2021 7:51:17 PM
2	156CALS.d	2/10/200	12/15/2021 7:53:15 PM
3	157CALS.d	5/25/500	12/15/2021 7:55:13 PM
4	158CALS.d	10/50/100	12/15/2021 7:57:11 PM
5	159CALS.d	100/500/10K	12/15/2021 7:59:09 PM
6	160CALS.d	200/1000/20K	12/15/2021 8:01:02 PM

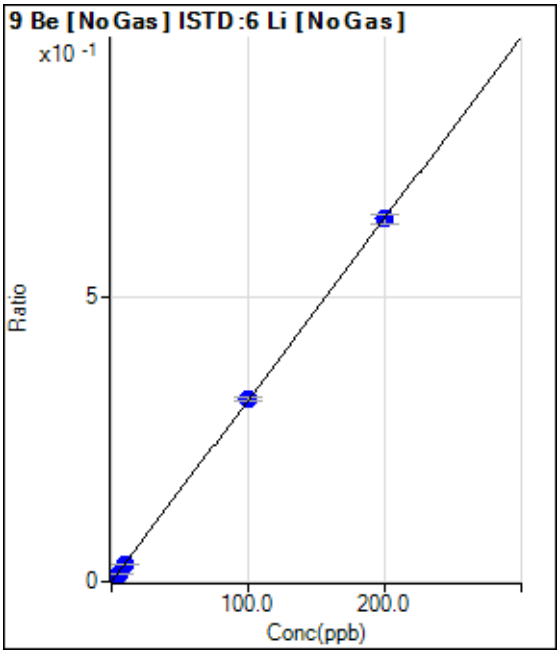
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	50552.12	0.0594	P	0.8
2	☐	2.000	1.899	69634.36	0.0825	P	1.1
3	☐	5.000	4.798	98214.42	0.1178	P	1.7
4	☐	10.000	9.544	146627.60	0.1756	P	1.4
5	☐	100.000	101.940	1024927.49	1.3011	A	4.5
6	☐	200.000	199.059	1916055.96	2.4842	A	3.4

y = 0.0122 * x + 0.0594
R = 0.9999
DL = 0.1106
BEC = 4.874

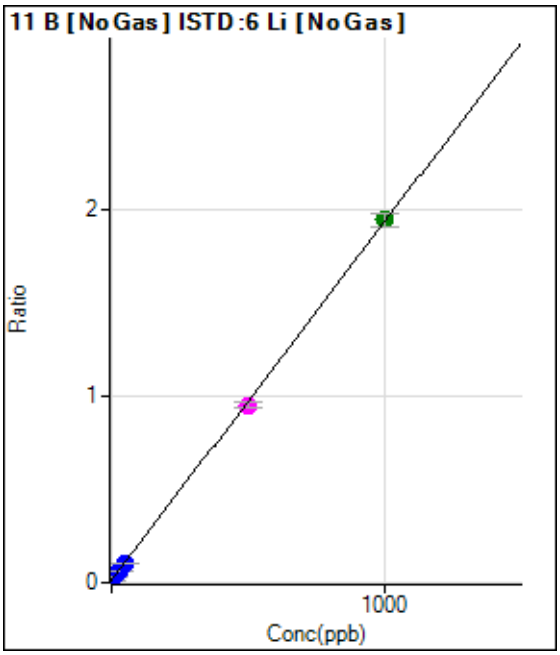
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	11.67	0.0000	P	64.5
2	☐	2.000	1.867	5025.95	0.0060	P	4.4
3	☐	5.000	4.688	12452.24	0.0149	P	2.3
4	☐	10.000	9.303	24736.75	0.0296	P	1.9
5	☐	100.000	100.368	251783.29	0.3196	P	2.4
6	☐	200.000	199.860	490818.99	0.6363	P	3.0

y = 0.0032 * x + 1.3642E-005
R = 1.0000
DL = 0.008288
BEC = 0.004285

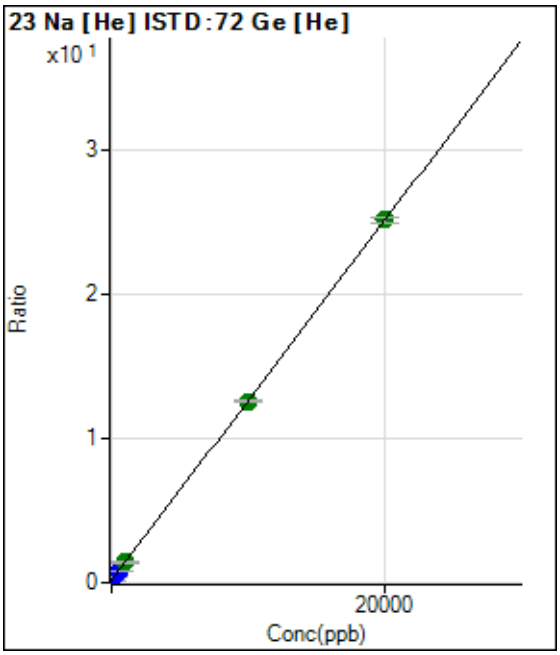
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	10959.36	0.0129	P	1.7
2	☐	10.000	9.165	25700.24	0.0304	P	0.9
3	☐	25.000	23.392	48130.44	0.0577	P	1.2
4	☐	50.000	47.375	86603.19	0.1037	P	0.5
5	☐	500.000	489.236	749403.14	0.9512	M	3.2
6	☐	1000.000	1005.562	1497279.20	1.9414	A	3.9

y = 0.0019 * x + 0.0129
R = 0.9999
DL = 0.3404
BEC = 6.711

Weight: <None>
Min Conc: <None>

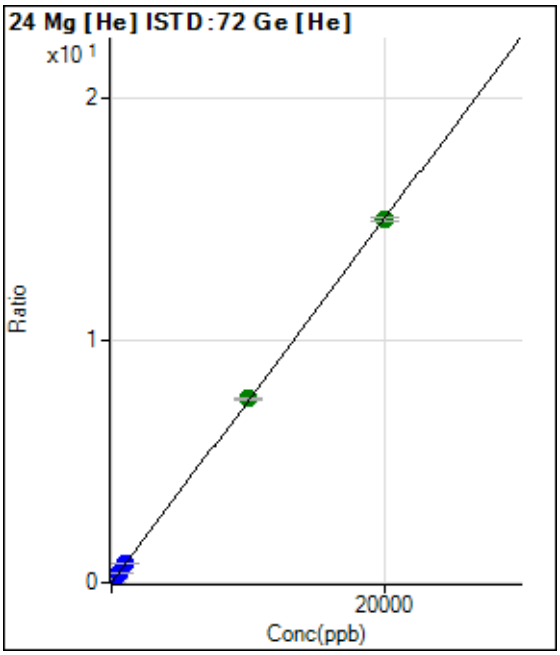


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	113314.05	0.1633	P	0.7
2	☐	200.000	198.289	286337.36	0.4101	P	0.5
3	☐	500.000	501.016	555136.35	0.7870	P	1.0
4	☐	1000.000	1002.597	986188.45	1.4115	A	2.3
5	☐	10000.00	9928.910	8630568.00	12.5249	A	1.3
6	☐	20000.00	20035.40	17034505.17	25.1076	A	1.3

y = 0.0012 * x + 0.1633
R = 1.0000
DL = 2.612
BEC = 131.1

Weight: <None>
Min Conc: <None>

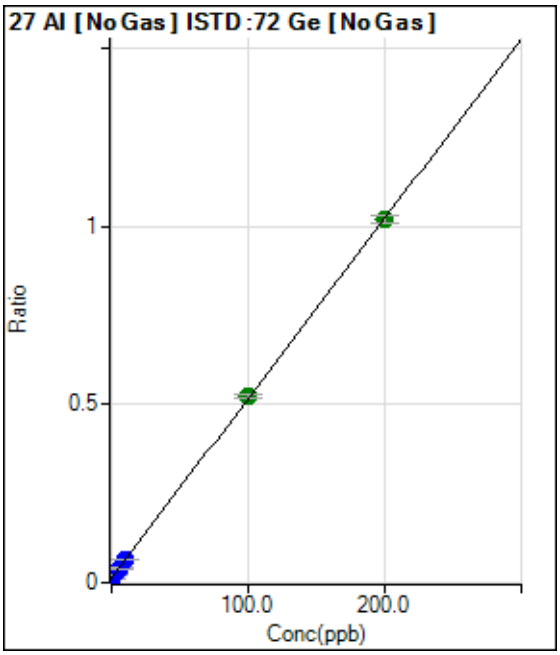
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	443.35	0.0006	P	9.4
2	☐	200.000	206.815	108913.14	0.1560	P	0.4
3	☐	500.000	516.749	274258.94	0.3888	P	0.2
4	☐	1000.000	1046.621	549796.96	0.7869	P	1.3
5	☐	10000.00	10118.72	5238421.49	7.6019	A	1.3
6	☐	20000.00	19937.81	10162238.18	14.9782	A	1.1

y = 7.5121E-004 * x + 6.3888E-004
R = 1.0000
DL = 0.2391
BEC = 0.8505

Weight: <None>
Min Conc: <None>

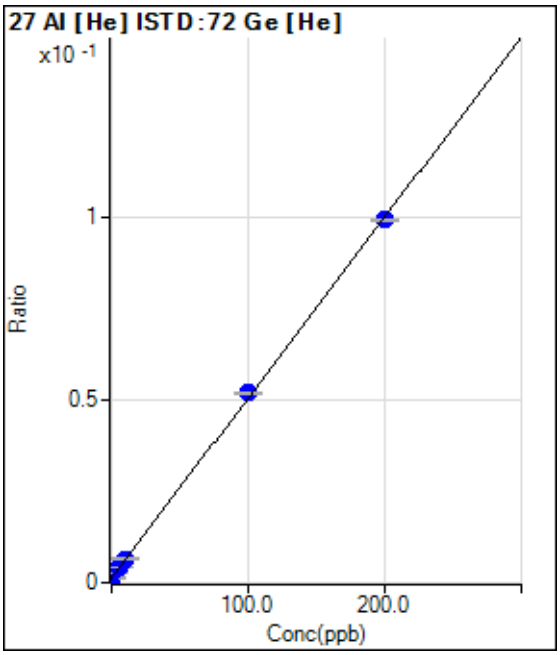


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	27811.48	0.0130	P	0.3
2	☐	2.000	2.098	50608.92	0.0236	P	0.6
3	☐	5.000	5.412	86450.94	0.0403	P	1.3
4	☐	10.000	10.639	141654.95	0.0667	P	0.8
5	☐	100.000	101.232	1095713.63	0.5238	A	1.8
6	☐	200.000	199.340	2115045.70	1.0189	A	2.1

y = 0.0050 * x + 0.0130
R = 1.0000
DL = 0.02521
BEC = 2.576

Weight: <None>
Min Conc: <None>

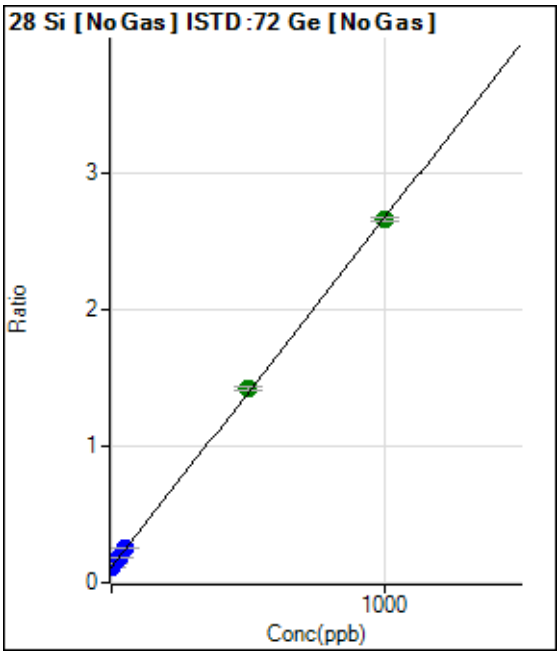
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	910.04	0.0013	P	6.0
2	☐	2.000	4.163	2345.78	0.0034	P	50.4
3	☐	5.000	5.715	2913.70	0.0041	P	8.5
4	☐	10.000	10.539	4547.49	0.0065	P	4.0
5	☐	100.000	102.636	35779.61	0.0519	P	0.8
6	☐	200.000	198.615	67345.96	0.0993	P	0.6

y = 4.9311E-004 * x + 0.0013
R = 0.9999
DL = 0.479
BEC = 2.659

Weight: <None>
Min Conc: <None>

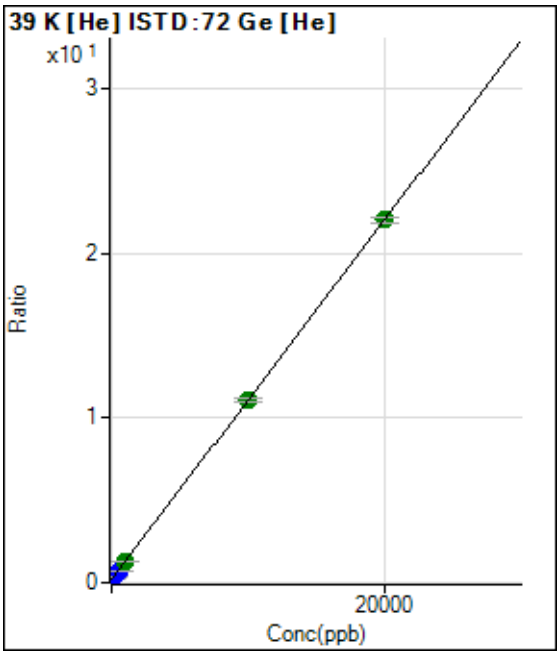


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	244693.35	0.1144	P	0.8
2	☐	10.000	11.161	306587.58	0.1429	P	1.4
3	☐	25.000	25.934	387339.06	0.1806	P	1.0
4	☐	50.000	54.999	541457.00	0.2548	P	2.7
5	☐	500.000	510.462	2966471.94	1.4181	A	1.6
6	☐	1000.000	994.484	5510487.42	2.6543	A	1.0

y = 0.0026 * x + 0.1144
R = 0.9999
DL = 1.031
BEC = 44.78

Weight: <None>
Min Conc: <None>

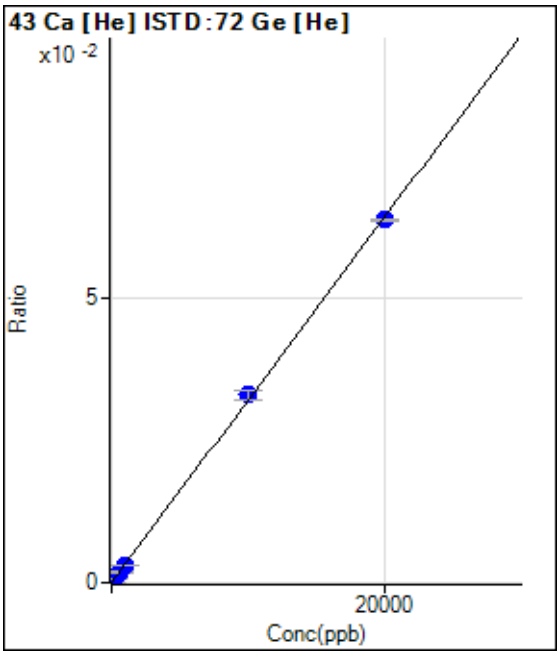
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	128419.33	0.1850	P	1.2
2	☐	200.000	196.550	278995.15	0.3996	P	0.8
3	☐	500.000	489.935	507812.43	0.7200	P	0.4
4	☐	1000.000	1010.304	900013.14	1.2881	A	2.5
5	☐	10000.00	9992.037	7644615.93	11.0945	A	1.9
6	☐	20000.00	20003.75	14945588.53	22.0255	A	1.4

y = 0.0011 * x + 0.1850
R = 1.0000
DL = 5.92
BEC = 169.5

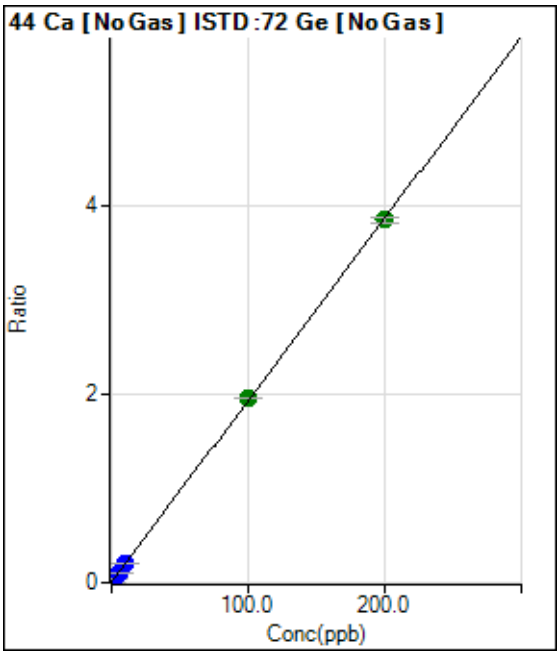
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	23.33	0.0000	P	65.7
2	☐	200.000	200.542	473.35	0.0007	P	20.4
3	☐	500.000	520.666	1203.41	0.0017	P	20.6
4	☐	1000.000	945.359	2146.88	0.0031	P	4.6
5	☐	10000.00	10278.06	22789.11	0.0331	P	4.6
6	☐	20000.00	19863.18	43355.16	0.0639	P	0.7

y = 3.2151E-006 * x + 3.3638E-005
R = 0.9999
DL = 20.62
BEC = 10.46

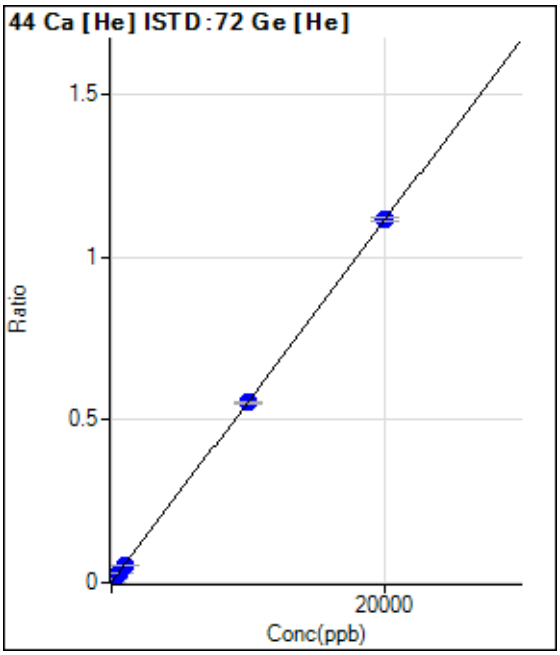
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	8732.91	0.0041	P	5.1
2	☐	2.000	1.997	91626.69	0.0427	P	0.6
3	☐	5.000	5.025	217152.36	0.1013	P	2.3
4	☐	10.000	10.225	428703.83	0.2018	P	1.2
5	☐	100.000	101.354	4109185.35	1.9642	A	0.3
6	☐	200.000	199.311	8011030.30	3.8587	A	1.7

y = 0.0193 * x + 0.0041
R = 1.0000
DL = 0.03208
BEC = 0.211

Weight: <None>
Min Conc: <None>

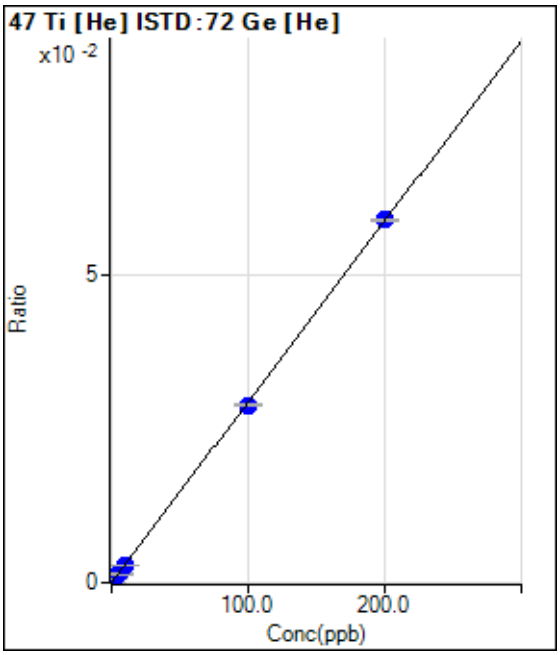


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	546.69	0.0008	P	18.5
2	☐	200.000	190.831	7965.79	0.0114	P	3.3
3	☐	500.000	483.440	19534.13	0.0277	P	2.6
4	☐	1000.000	973.385	38407.17	0.0550	P	0.7
5	☐	10000.00	9940.334	381811.75	0.5541	P	0.8
6	☐	20000.00	20031.66	757009.42	1.1157	P	0.9

y = 5.5660E-005 * x + 7.8783E-004
R = 1.0000
DL = 7.866
BEC = 14.15

Weight: <None>
Min Conc: <None>

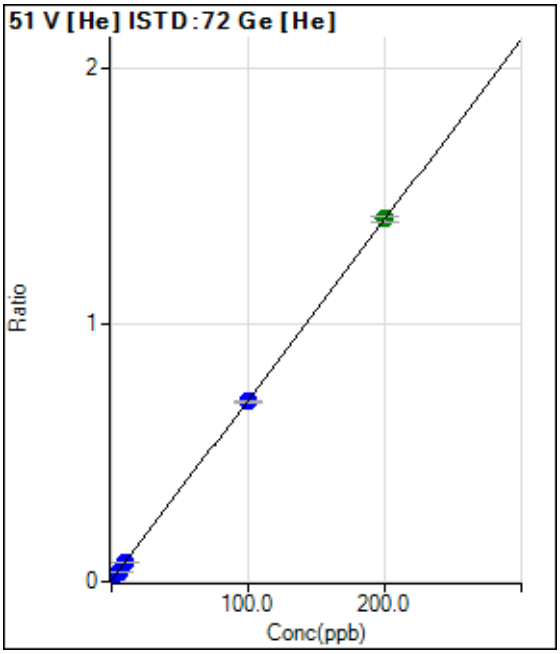
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	13.33	0.0000	P	42.9
2	☐	2.000	1.919	406.68	0.0006	P	1.3
3	☐	5.000	5.003	1050.06	0.0015	P	16.0
4	☐	10.000	9.782	2020.19	0.0029	P	4.0
5	☐	100.000	98.402	19918.05	0.0289	P	1.4
6	☐	200.000	200.811	40005.09	0.0590	P	0.4

y = 2.9351E-004 * x + 1.9193E-005
R = 1.0000
DL = 0.08424
BEC = 0.06539

Weight: <None>
Min Conc: <None>

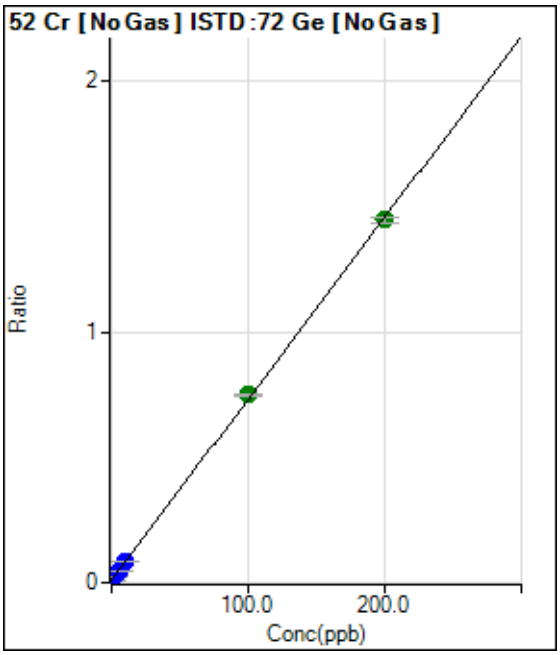


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4102.86	0.0059	P	2.1
2	☐	2.000	1.914	13505.57	0.0193	P	0.5
3	☐	5.000	4.767	27767.01	0.0394	P	1.0
4	☐	10.000	9.693	51660.06	0.0739	P	0.4
5	☐	100.000	99.023	482915.14	0.7008	P	1.0
6	☐	200.000	200.511	958686.66	1.4130	A	1.8

y = 0.0070 * x + 0.0059
R = 1.0000
DL = 0.05371
BEC = 0.8424

Weight: <None>
Min Conc: <None>

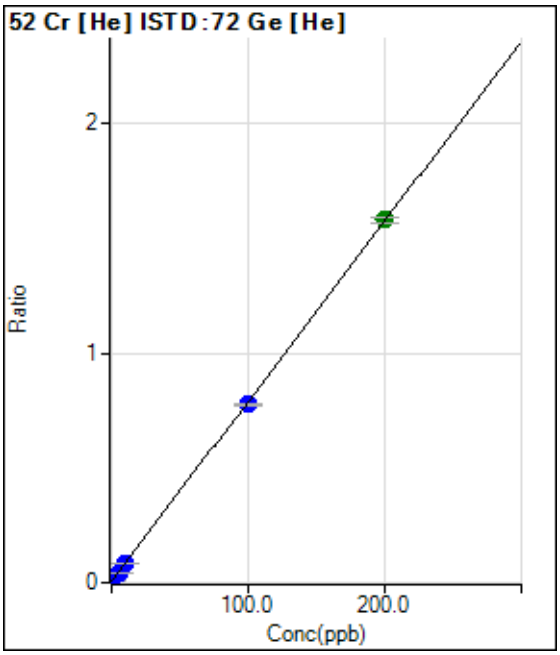
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	19674.40	0.0092	P	2.6
2	☐	2.000	2.013	50951.59	0.0237	P	1.6
3	☐	5.000	5.040	97868.01	0.0456	P	1.1
4	☐	10.000	10.124	174976.90	0.0824	P	1.9
5	☐	100.000	102.297	1566235.60	0.7487	A	1.2
6	☐	200.000	198.844	3003258.91	1.4467	A	1.5

y = 0.0072 * x + 0.0092
R = 0.9999
DL = 0.09736
BEC = 1.272

Weight: <None>
Min Conc: <None>

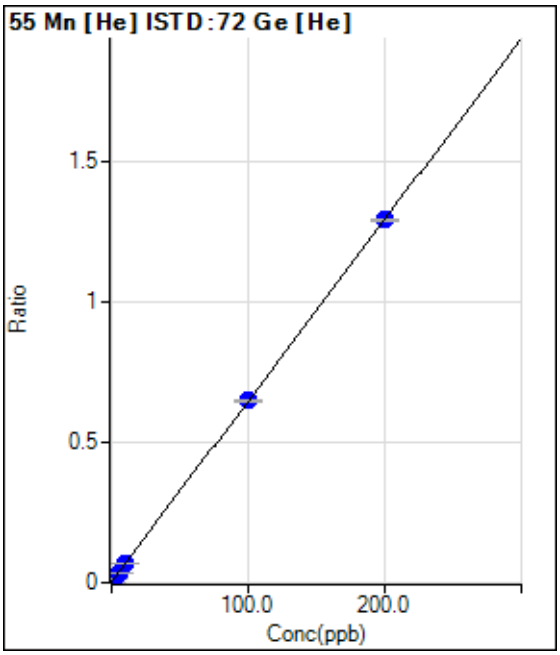


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	3803.93	0.0055	P	4.2
2	☐	2.000	2.039	14995.08	0.0215	P	3.0
3	☐	5.000	4.898	30978.65	0.0439	P	1.9
4	☐	10.000	9.974	58521.46	0.0838	P	1.1
5	☐	100.000	98.300	535351.20	0.7769	P	0.4
6	☐	200.000	200.853	1073166.31	1.5816	A	1.3

y = 0.0078 * x + 0.0055
R = 0.9999
DL = 0.08734
BEC = 0.6984

Weight: <None>
Min Conc: <None>

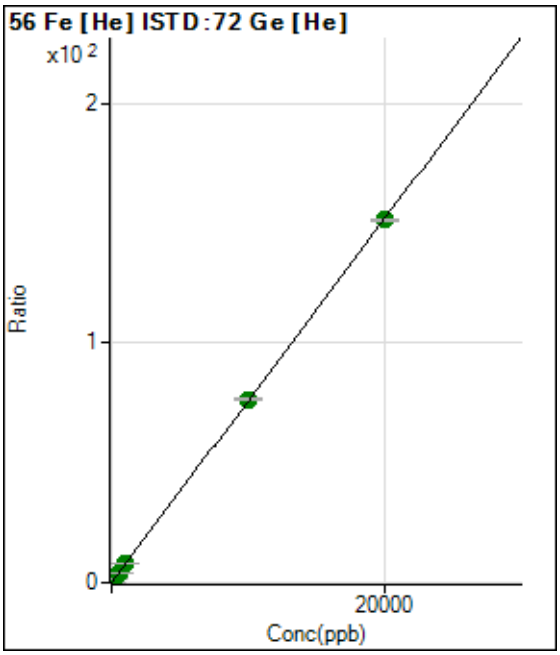
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1766.82	0.0025	P	9.6
2	☐	2.000	1.976	10671.01	0.0153	P	4.1
3	☐	5.000	4.880	23987.98	0.0340	P	0.7
4	☐	10.000	9.847	46144.89	0.0660	P	2.5
5	☐	100.000	100.084	446422.66	0.6478	P	0.7
6	☐	200.000	199.969	876514.18	1.2919	P	0.6

y = 0.0064 * x + 0.0025
R = 1.0000
DL = 0.1135
BEC = 0.3948

Weight: <None>
Min Conc: <None>

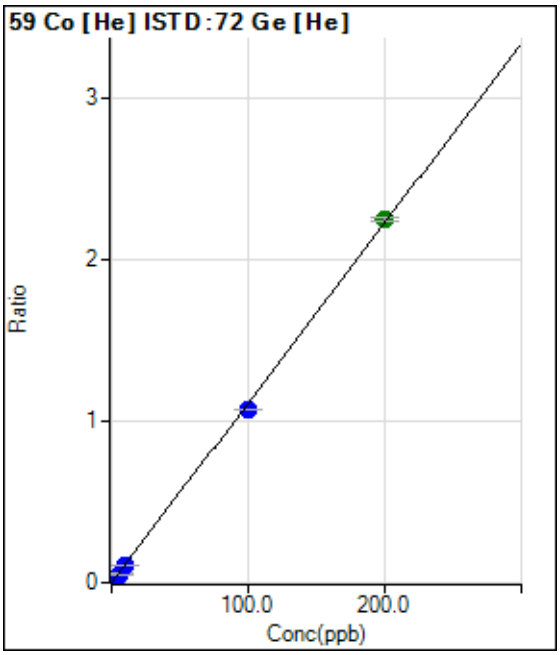


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	13430.13	0.0194	P	1.8
2	☐	200.000	201.884	1082643.03	1.5508	A	1.8
3	☐	500.000	501.049	2694485.38	3.8202	A	1.1
4	☐	1000.000	1013.739	5386461.17	7.7094	A	2.0
5	☐	10000.00	10095.62	52787539.21	76.6034	A	0.7
6	☐	20000.00	19951.45	102704068.4	151.368	A	0.3

y = 0.0076 * x + 0.0194
R = 1.0000
DL = 0.1374
BEC = 2.551

Weight: <None>
Min Conc: <None>

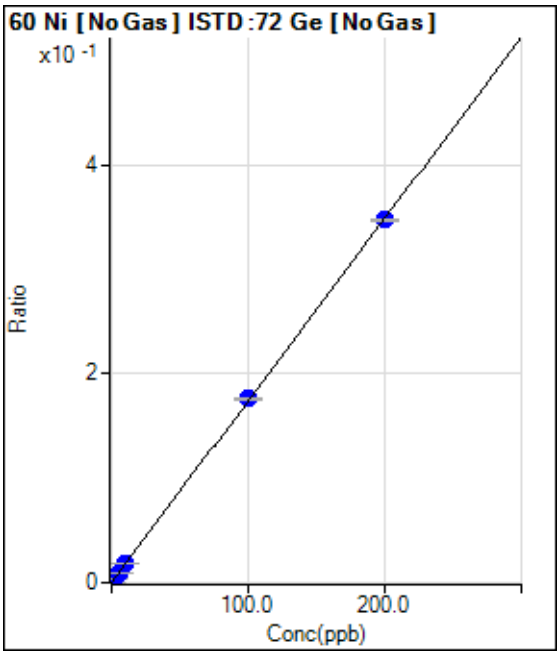
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	33.33	0.0000	P	75.6
2	☐	2.000	1.884	14688.12	0.0210	P	4.0
3	☐	5.000	4.772	37528.52	0.0532	P	3.4
4	☐	10.000	9.576	74587.09	0.1067	P	0.5
5	☐	100.000	96.338	739721.81	1.0735	P	0.6
6	☐	200.000	201.859	1526007.06	2.2492	A	1.1

y = 0.0111 * x + 4.8018E-005
R = 0.9998
DL = 0.009775
BEC = 0.00431

Weight: <None>
Min Conc: <None>

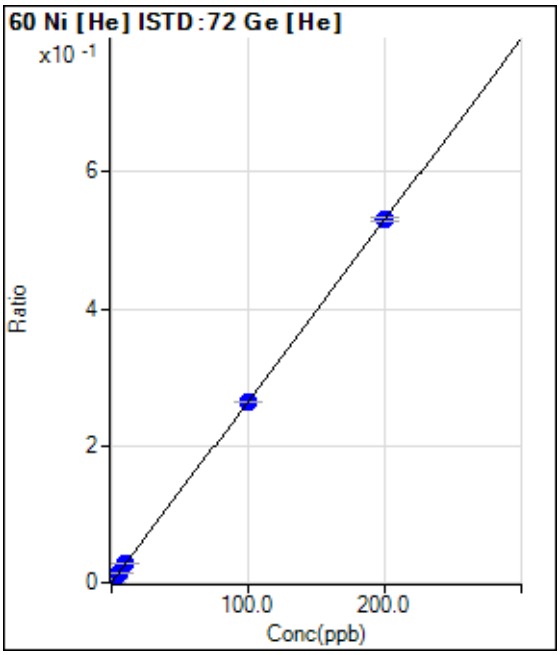


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	413.35	0.0002	P	4.7
2	☐	2.000	2.063	8122.56	0.0038	P	1.1
3	☐	5.000	4.979	19010.27	0.0089	P	3.2
4	☐	10.000	10.155	37979.88	0.0179	P	1.2
5	☐	100.000	101.033	368511.39	0.1762	P	1.7
6	☐	200.000	199.476	721702.54	0.3476	P	0.7

y = 0.0017 * x + 1.9318E-004
R = 1.0000
DL = 0.0156
BEC = 0.1109

Weight: <None>
Min Conc: <None>

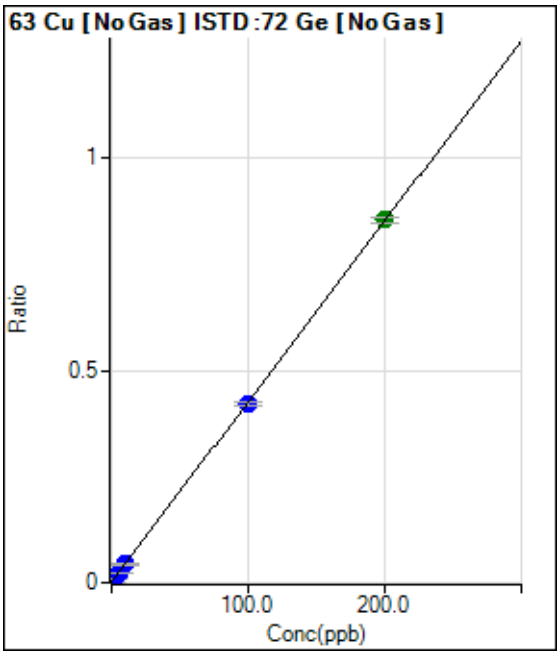
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	90.00	0.0001	P	0.3
2	☐	2.000	2.087	3947.30	0.0057	P	5.8
3	☐	5.000	4.978	9390.02	0.0133	P	0.7
4	☐	10.000	10.122	18819.89	0.0269	P	0.8
5	☐	100.000	99.856	182307.53	0.2645	P	0.2
6	☐	200.000	200.066	359532.01	0.5299	P	1.1

y = 0.0026 * x + 1.2967E-004
R = 1.0000
DL = 0.0004827
BEC = 0.04897

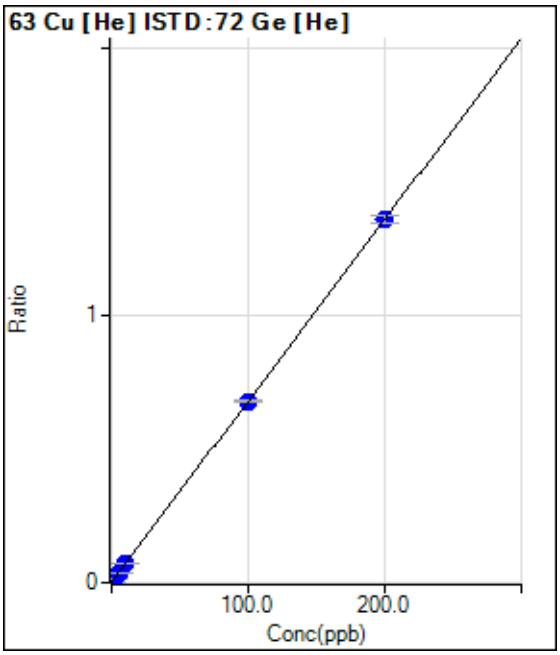
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2376.93	0.0011	P	4.9
2	☐	2.000	1.875	19484.22	0.0091	P	2.0
3	☐	5.000	4.875	46824.36	0.0218	P	4.0
4	☐	10.000	9.943	92140.88	0.0434	P	1.7
5	☐	100.000	98.504	878314.15	0.4199	P	2.0
6	☐	200.000	200.755	1774057.53	0.8546	A	1.9

y = 0.0043 * x + 0.0011
R = 1.0000
DL = 0.03844
BEC = 0.2614

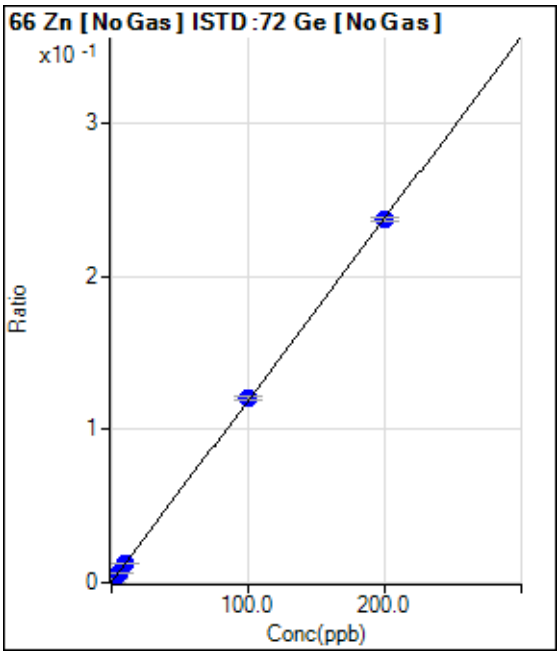
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	983.38	0.0014	P	4.2
2	☐	2.000	1.994	10427.52	0.0149	P	6.4
3	☐	5.000	4.908	24472.29	0.0347	P	1.9
4	☐	10.000	10.035	48530.34	0.0695	P	2.4
5	☐	100.000	100.017	468287.56	0.6795	P	0.2
6	☐	200.000	199.992	920881.78	1.3574	P	2.1

y = 0.0068 * x + 0.0014
R = 1.0000
DL = 0.02615
BEC = 0.209

Weight: <None>
Min Conc: <None>

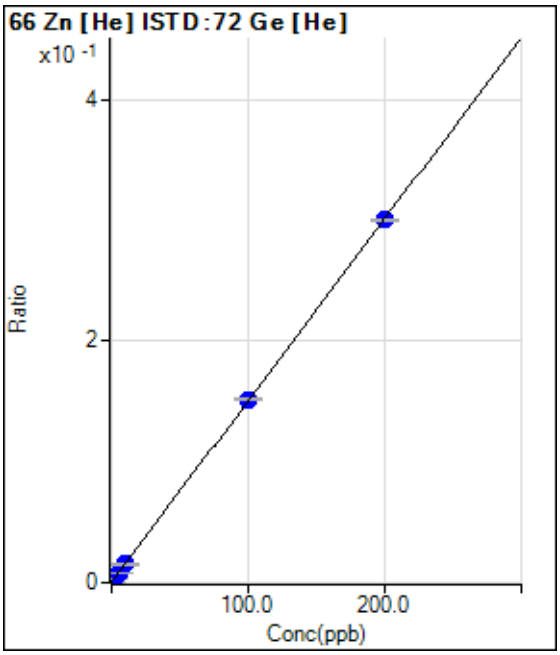


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	626.69	0.0003	P	29.2
2	☐	2.000	1.873	5394.50	0.0025	P	5.3
3	☐	5.000	5.037	13443.56	0.0063	P	1.9
4	☐	10.000	9.986	25788.16	0.0121	P	1.7
5	☐	100.000	101.425	252361.26	0.1206	P	1.4
6	☐	200.000	199.288	491509.50	0.2368	P	1.1

y = 0.0012 * x + 2.9278E-004
R = 1.0000
DL = 0.2161
BEC = 0.2468

Weight: <None>
Min Conc: <None>

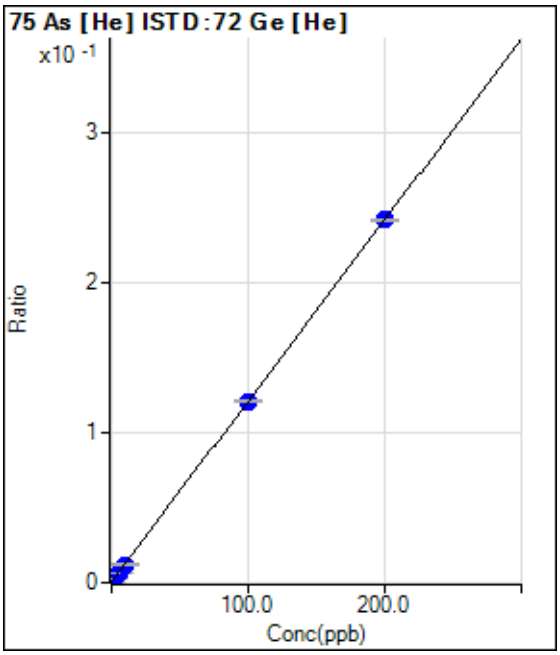
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	266.68	0.0004	P	12.3
2	☐	2.000	1.855	2213.56	0.0032	P	1.0
3	☐	5.000	4.842	5401.17	0.0077	P	7.6
4	☐	10.000	9.816	10574.28	0.0151	P	3.9
5	☐	100.000	100.860	104691.33	0.1519	P	0.6
6	☐	200.000	199.584	203721.61	0.3003	P	0.8

y = 0.0015 * x + 3.8432E-004
R = 1.0000
DL = 0.09465
BEC = 0.2558

Weight: <None>
Min Conc: <None>

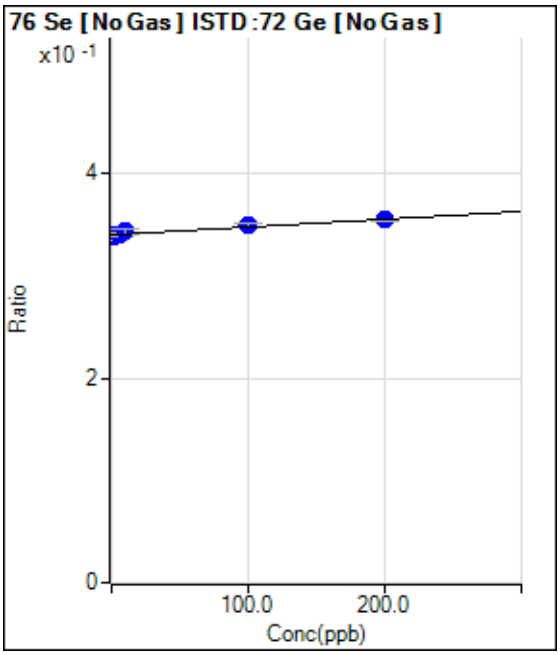


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	317.79	0.0005	P	8.8
2	☐	2.000	1.910	1925.71	0.0028	P	1.6
3	☐	5.000	4.725	4337.39	0.0061	P	2.2
4	☐	10.000	9.667	8458.24	0.0121	P	2.6
5	☐	100.000	99.868	83221.19	0.1208	P	0.9
6	☐	200.000	200.091	163860.94	0.2415	P	0.8

y = 0.0012 * x + 4.5777E-004
R = 1.0000
DL = 0.1006
BEC = 0.38

Weight: <None>
Min Conc: <None>

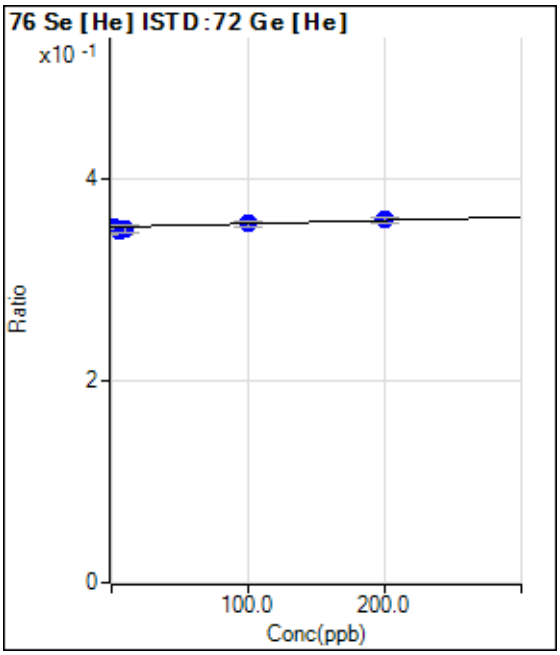
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	727412.57	0.3400	P	0.5
2	☐	2.000	-29.630	724616.68	0.3377	P	1.4
3	☐	5.000	-2.077	728842.23	0.3398	P	1.0
4	☐	10.000	48.900	730107.75	0.3437	P	1.7
5	☐	100.000	115.843	729778.82	0.3489	P	1.0
6	☐	200.000	190.626	736115.51	0.3546	P	0.4

y = 7.6366E-005 * x + 0.3400
R = 0.9585
DL = 61.1
BEC = 4452

Weight: <None>
Min Conc: <None>

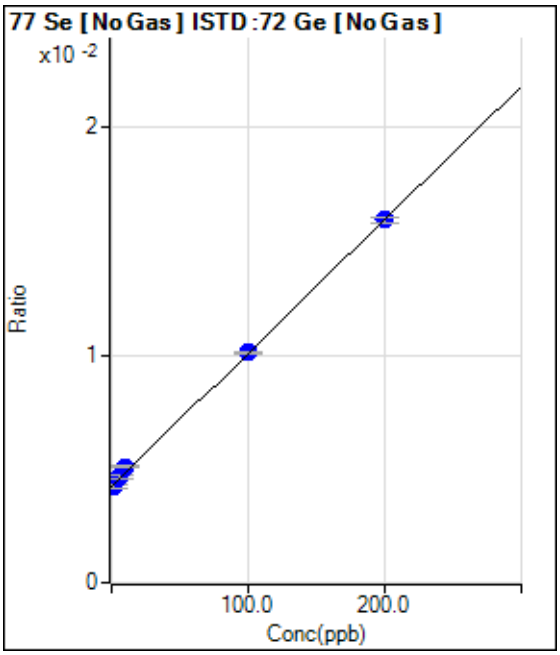


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	244719.10	0.3526	P	1.0
2	☐	2.000	12.062	246438.62	0.3530	P	1.0
3	☐	5.000	-144.691	245345.07	0.3478	P	1.6
4	☐	10.000	-64.315	244886.86	0.3505	P	1.8
5	☐	100.000	89.892	245009.27	0.3555	P	1.3
6	☐	200.000	212.411	243956.77	0.3596	P	1.4

y = 3.2851E-005 * x + 0.3526
R = 0.8815
DL = 335.5
BEC = 1.073E+04

Weight: <None>
Min Conc: <None>

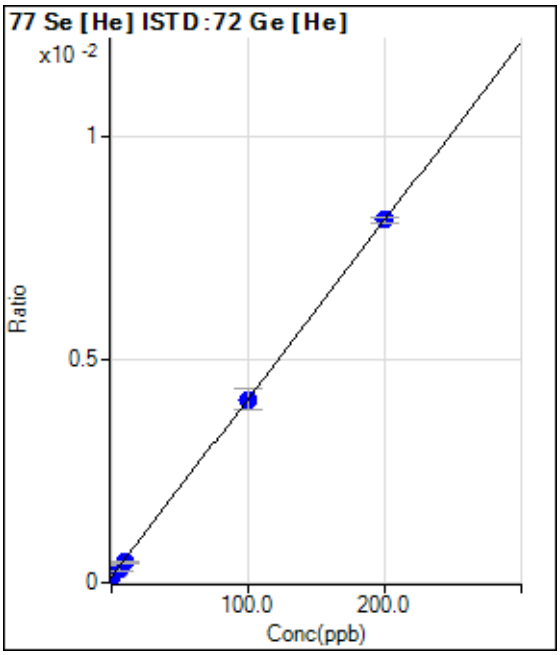
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	9059.87	0.0042	P	3.3
2	☐	2.000	0.340	9126.57	0.0043	P	4.5
3	☐	5.000	7.334	10003.90	0.0047	P	2.8
4	☐	10.000	14.732	10831.15	0.0051	P	1.6
5	☐	100.000	100.191	21160.16	0.0101	P	1.1
6	☐	200.000	199.626	33111.02	0.0159	P	1.8

y = 5.8684E-005 * x + 0.0042
R = 0.9996
DL = 7.179
BEC = 72.16

Weight: <None>
Min Conc: <None>

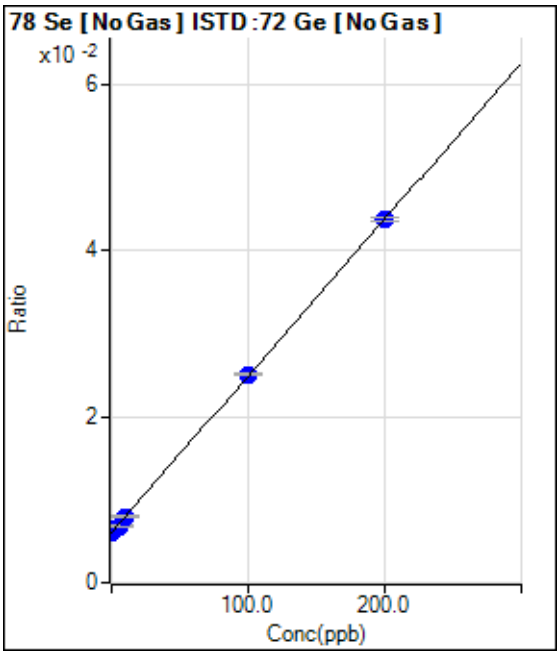


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	90.00	0.0001	P	11.3
2	☐	2.000	1.651	136.67	0.0002	P	15.5
3	☐	5.000	4.656	223.34	0.0003	P	35.3
4	☐	10.000	8.311	323.34	0.0005	P	6.7
5	☐	100.000	99.748	2843.69	0.0041	P	10.9
6	☐	200.000	200.222	5527.91	0.0081	P	1.8

y = 4.0046E-005 * x + 1.2970E-004
R = 1.0000
DL = 1.102
BEC = 3.239

Weight: <None>
Min Conc: <None>

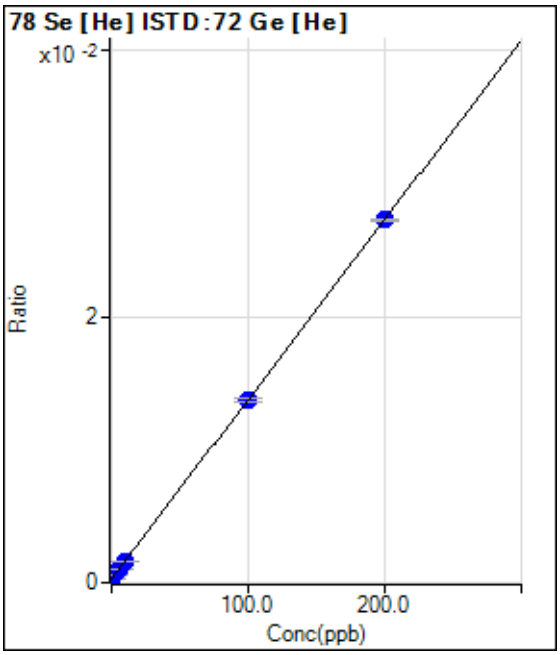
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	12976.40	0.0061	P	3.4
2	☐	2.000	2.102	13864.03	0.0065	P	6.1
3	☐	5.000	3.962	14611.46	0.0068	P	1.0
4	☐	10.000	9.740	16784.01	0.0079	P	3.2
5	☐	100.000	100.925	52525.64	0.0251	P	0.9
6	☐	200.000	199.575	90771.54	0.0437	P	0.9

y = 1.8869E-004 * x + 0.0061
R = 1.0000
DL = 3.288
BEC = 32.14

Weight: <None>
Min Conc: <None>

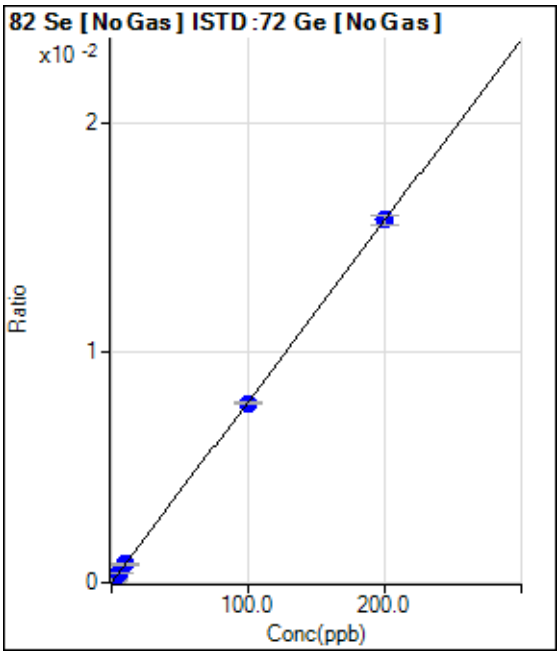


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	191.33	0.0003	P	10.2
2	☐	2.000	2.075	388.01	0.0006	P	1.9
3	☐	5.000	5.114	681.35	0.0010	P	3.5
4	☐	10.000	9.702	1108.05	0.0016	P	5.3
5	☐	100.000	99.935	9484.69	0.0138	P	1.7
6	☐	200.000	200.044	18505.35	0.0273	P	0.3

y = 1.3496E-004 * x + 2.7573E-004
R = 1.0000
DL = 0.6278
BEC = 2.043

Weight: <None>
Min Conc: <None>

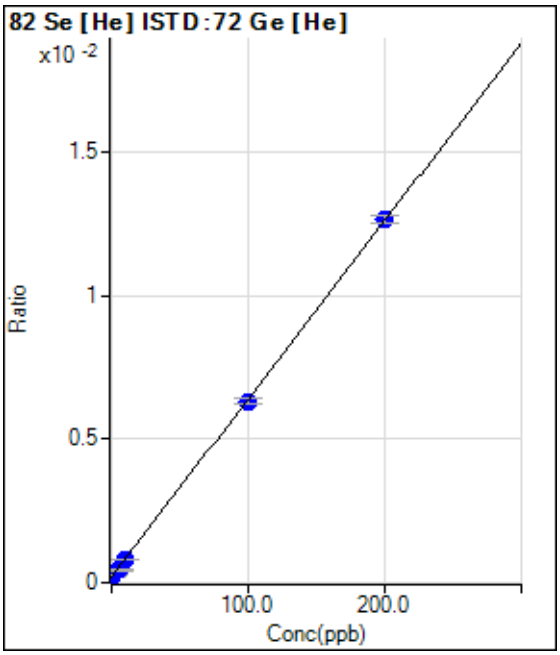
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	-47.84	0.0000	P	-178.9
2	☐	2.000	1.670	234.98	0.0001	P	65.7
3	☐	5.000	5.042	805.87	0.0004	P	8.0
4	☐	10.000	10.416	1698.71	0.0008	P	10.9
5	☐	100.000	99.061	16312.69	0.0078	P	1.0
6	☐	200.000	200.451	32806.75	0.0158	P	2.4

y = 7.8946E-005 * x - 2.2463E-005
R = 1.0000
DL = 1.527
BEC = -0.2845

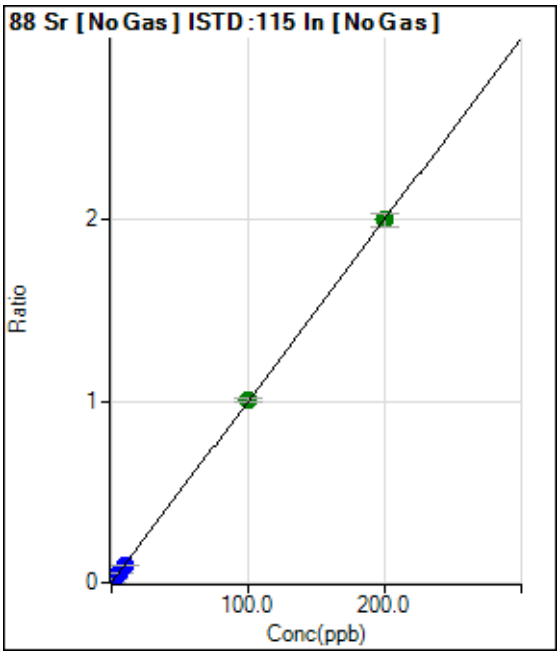
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	143.34	0.0002	P	31.1
2	☐	2.000	1.835	223.34	0.0003	P	13.4
3	☐	5.000	3.838	313.34	0.0004	P	6.1
4	☐	10.000	9.532	556.69	0.0008	P	4.5
5	☐	100.000	98.807	4360.79	0.0063	P	3.4
6	☐	200.000	200.651	8572.88	0.0126	P	2.2

y = 6.1943E-005 * x + 2.0638E-004
R = 1.0000
DL = 3.112
BEC = 3.332

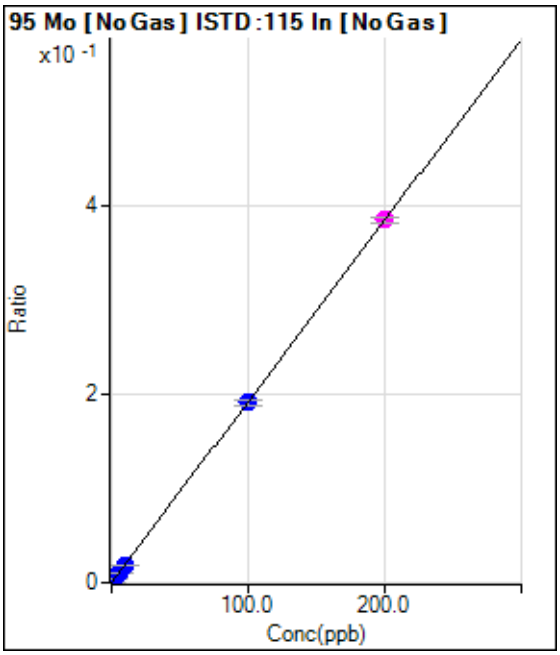
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1343.43	0.0005	P	10.1
2	☐	2.000	1.873	52359.32	0.0192	P	1.6
3	☐	5.000	4.780	131241.93	0.0483	P	0.6
4	☐	10.000	9.487	261107.26	0.0954	P	0.6
5	☐	100.000	100.306	2644517.98	1.0035	A	2.1
6	☐	200.000	199.879	5225902.53	1.9992	A	3.4

y = 0.0100 * x + 4.9411E-004
R = 1.0000
DL = 0.01501
BEC = 0.04941

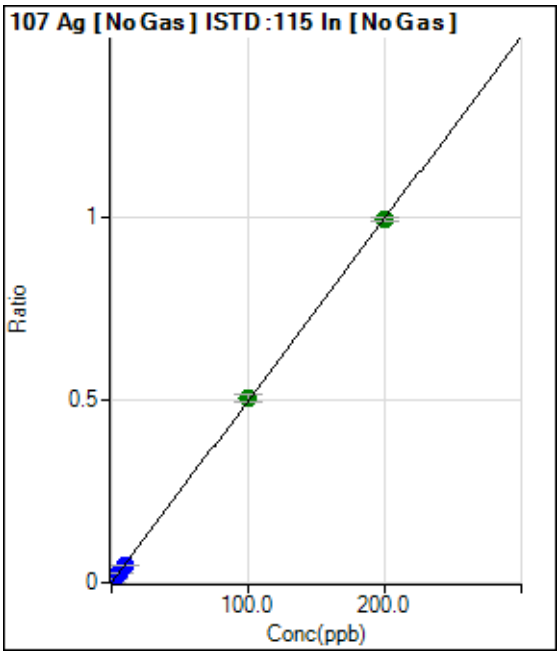
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	50.00	0.0000	P	35.7
2	☐	2.000	1.924	10147.36	0.0037	P	1.3
3	☐	5.000	4.843	25397.84	0.0093	P	0.3
4	☐	10.000	9.588	50606.31	0.0185	P	1.0
5	☐	100.000	99.342	504255.51	0.1914	P	2.3
6	☐	200.000	200.354	1008879.65	0.3859	M	1.3

y = 0.0019 * x + 1.8426E-005
R = 1.0000
DL = 0.01024
BEC = 0.009567

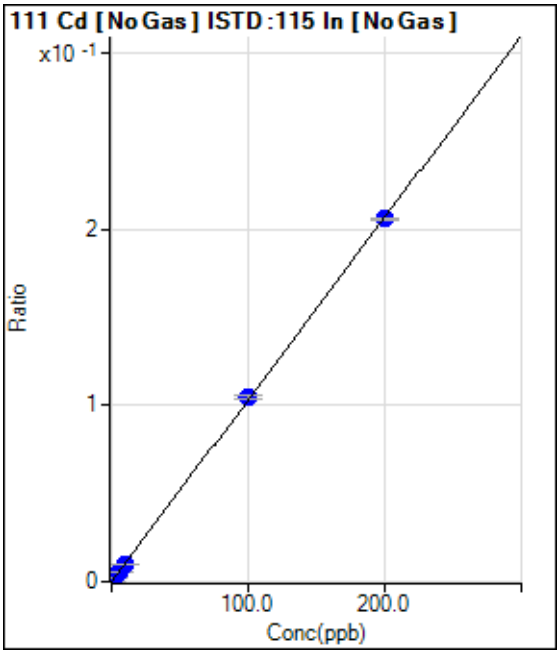
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	160.00	0.0001	P	28.3
2	☐	2.000	1.904	25945.63	0.0095	P	1.6
3	☐	5.000	4.767	64574.07	0.0238	P	0.4
4	☐	10.000	9.704	132276.17	0.0483	P	1.3
5	☐	100.000	101.404	1328584.30	0.5043	A	4.2
6	☐	200.000	199.319	2591097.26	0.9912	A	1.0

y = 0.0050 * x + 5.8942E-005
R = 1.0000
DL = 0.01005
BEC = 0.01185

Weight: <None>
Min Conc: <None>

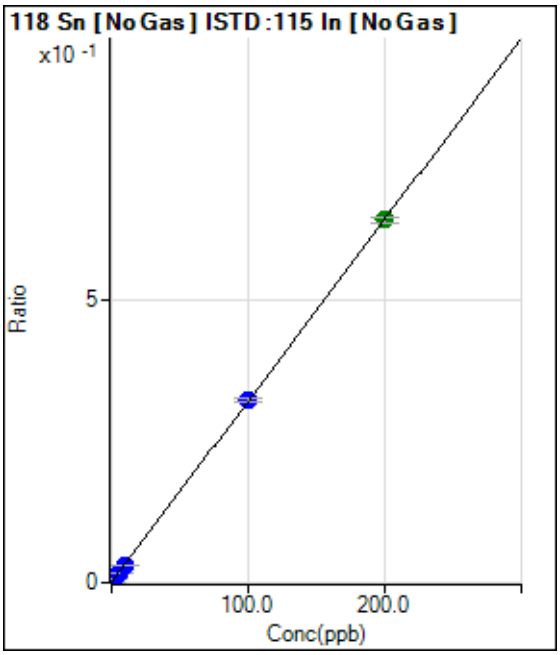


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	13.33	0.0000	P	86.6
2	☐	2.000	1.908	5384.55	0.0020	P	5.2
3	☐	5.000	4.853	13650.59	0.0050	P	2.2
4	☐	10.000	9.859	27923.28	0.0102	P	0.8
5	☐	100.000	101.223	275812.55	0.1047	P	2.0
6	☐	200.000	199.400	538979.20	0.2062	P	0.3

y = 0.0010 * x + 4.8773E-006
R = 1.0000
DL = 0.01226
BEC = 0.004718

Weight: <None>
Min Conc: <None>

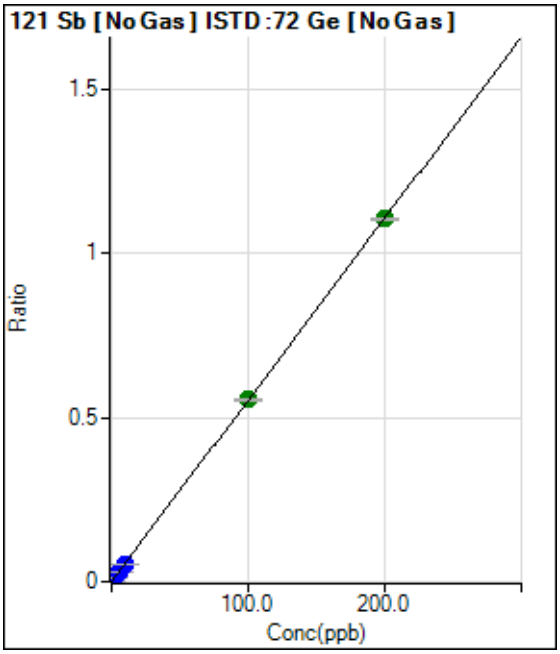
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1323.42	0.0005	P	6.9
2	☐	2.000	1.909	17992.65	0.0066	P	6.0
3	☐	5.000	4.844	43522.43	0.0160	P	1.2
4	☐	10.000	9.631	85859.65	0.0314	P	1.2
5	☐	100.000	100.163	847408.76	0.3216	P	2.3
6	☐	200.000	199.942	1676551.59	0.6414	A	1.9

y = 0.0032 * x + 4.8650E-004
R = 1.0000
DL = 0.03142
BEC = 0.1518

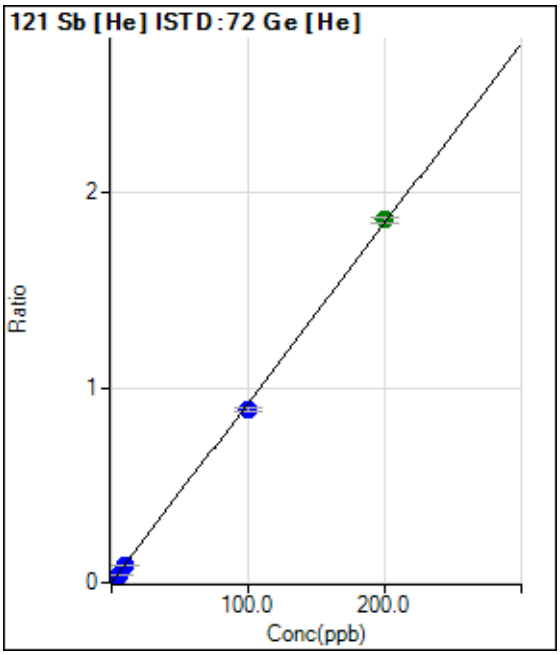
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	430.02	0.0002	P	19.6
2	☐	2.000	1.861	22526.25	0.0105	P	1.3
3	☐	5.000	4.824	57666.64	0.0269	P	2.5
4	☐	10.000	9.769	115192.57	0.0542	P	4.4
5	☐	100.000	100.341	1161695.11	0.5553	A	0.6
6	☐	200.000	199.847	2295859.34	1.1058	A	0.6

y = 0.0055 * x + 2.0093E-004
R = 1.0000
DL = 0.02138
BEC = 0.03632

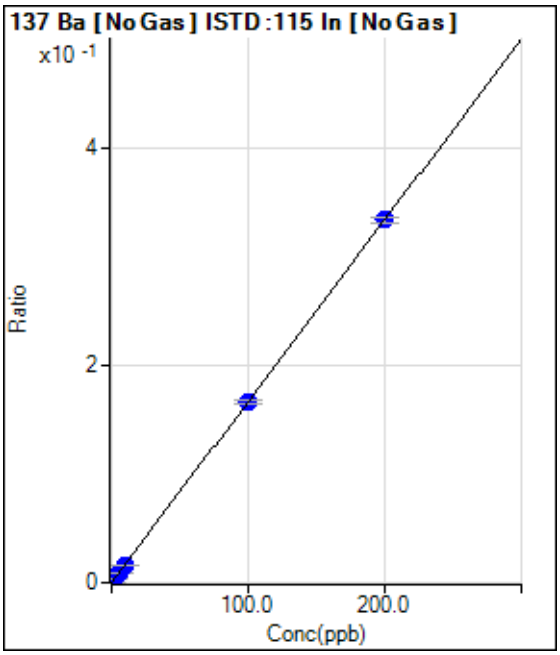
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	213.34	0.0003	P	22.0
2	☐	2.000	1.836	12029.07	0.0172	P	0.8
3	☐	5.000	4.626	30285.26	0.0429	P	1.1
4	☐	10.000	9.330	60291.79	0.0863	P	0.3
5	☐	100.000	96.372	612148.93	0.8884	P	1.5
6	☐	200.000	201.859	1262334.83	1.8605	A	1.3

y = 0.0092 * x + 3.0731E-004
R = 0.9998
DL = 0.02201
BEC = 0.03335

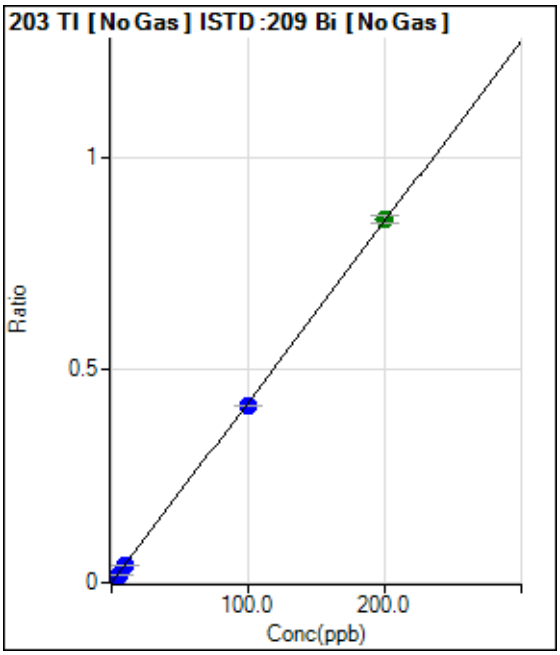
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	220.01	0.0001	P	11.1
2	☐	2.000	1.898	8826.49	0.0032	P	0.8
3	☐	5.000	4.815	21998.89	0.0081	P	2.6
4	☐	10.000	9.627	44085.02	0.0161	P	2.2
5	☐	100.000	99.635	437151.43	0.1659	P	2.8
6	☐	200.000	200.207	871177.83	0.3333	P	1.5

y = 0.0017 * x + 8.0844E-005
R = 1.0000
DL = 0.01623
BEC = 0.04858

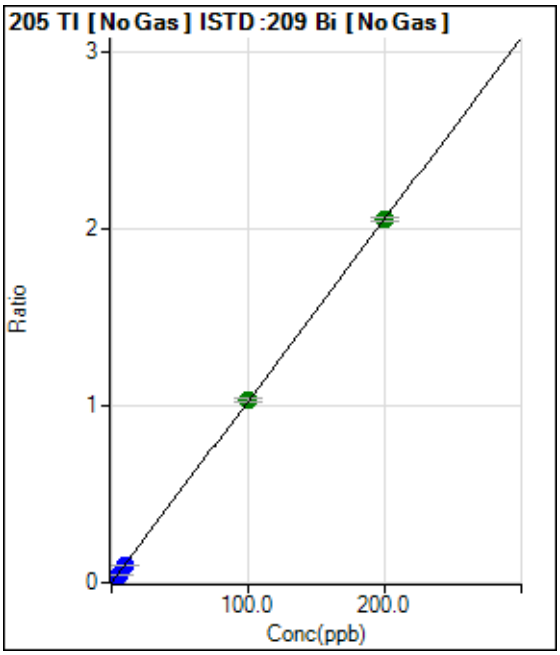
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	53.33	0.0000	P	65.1
2	☐	2.000	1.848	20089.72	0.0079	P	2.8
3	☐	5.000	4.734	52125.72	0.0201	P	1.0
4	☐	10.000	9.829	105301.46	0.0417	P	1.2
5	☐	100.000	98.258	1053303.71	0.4168	P	0.4
6	☐	200.000	200.887	2120172.52	0.8522	A	2.2

y = 0.0042 * x + 2.0878E-005
R = 0.9999
DL = 0.009612
BEC = 0.004922

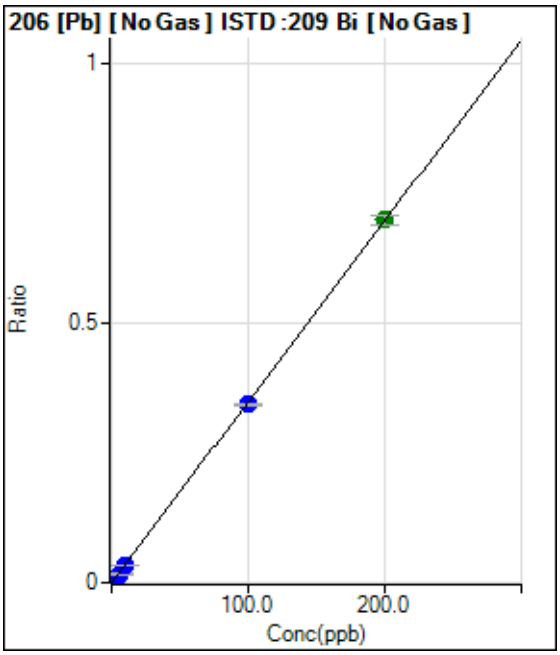
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	86.67	0.0000	P	51.8
2	☐	2.000	1.854	48661.91	0.0190	P	2.5
3	☐	5.000	4.650	123715.88	0.0477	P	2.6
4	☐	10.000	9.721	251697.18	0.0997	P	0.8
5	☐	100.000	100.609	2606829.28	1.0316	A	1.5
6	☐	200.000	199.720	5096070.03	2.0479	A	1.0

y = 0.0103 * x + 3.4236E-005
R = 1.0000
DL = 0.005189
BEC = 0.003339

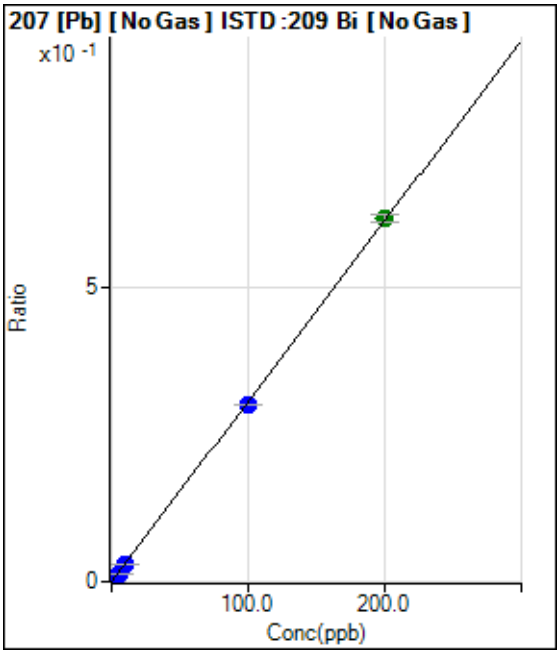
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	170.00	0.0001	P	25.7
2	☐	2.000	1.909	17165.45	0.0067	P	3.6
3	☐	5.000	4.728	42880.69	0.0165	P	2.0
4	☐	10.000	9.926	87448.76	0.0346	P	1.2
5	☐	100.000	98.667	868698.48	0.3438	P	1.1
6	☐	200.000	200.678	1739395.81	0.6991	A	2.8

y = 0.0035 * x + 6.7264E-005
R = 1.0000
DL = 0.01491
BEC = 0.01931

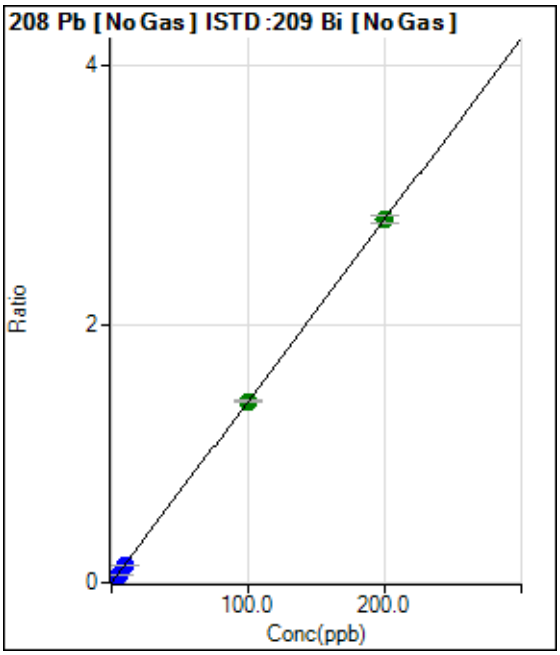
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	143.34	0.0001	P	37.0
2	☐	2.000	1.865	14782.39	0.0058	P	0.8
3	☐	5.000	4.678	37386.66	0.0144	P	1.1
4	☐	10.000	9.750	75706.30	0.0300	P	3.3
5	☐	100.000	97.788	758791.34	0.3003	P	0.5
6	☐	200.000	201.128	1536432.27	0.6175	A	2.3

y = 0.0031 * x + 5.6821E-005
R = 0.9999
DL = 0.02052
BEC = 0.01851

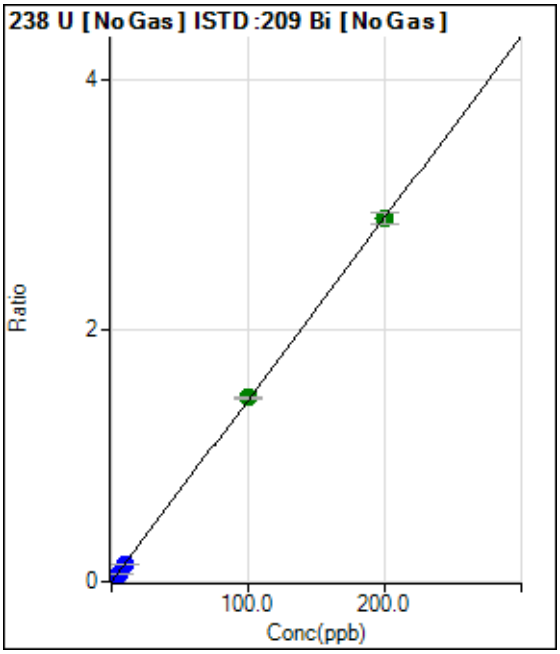
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	656.68	0.0003	P	17.3
2	☐	2.000	1.874	67859.79	0.0265	P	1.8
3	☐	5.000	4.707	171927.26	0.0663	P	1.7
4	☐	10.000	9.791	347423.54	0.1376	P	0.8
5	☐	100.000	100.141	3551009.12	1.4053	A	0.8
6	☐	200.000	199.948	6980568.75	2.8056	A	2.1

y = 0.0140 * x + 2.5944E-004
R = 1.0000
DL = 0.009597
BEC = 0.01849

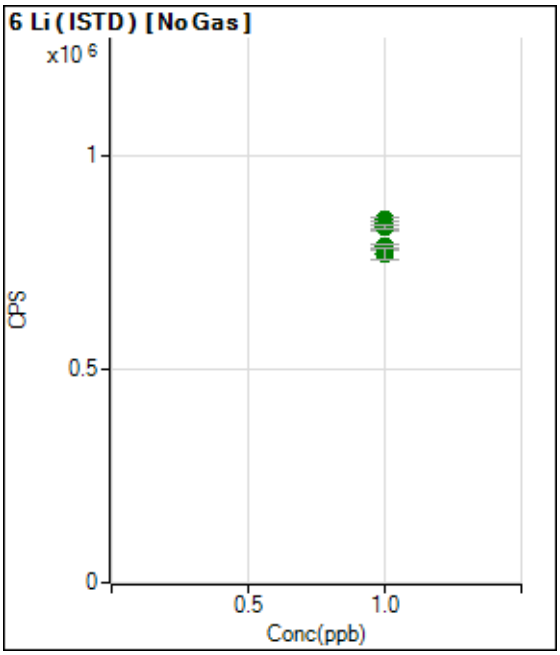
Weight: <None>
Min Conc: <None>



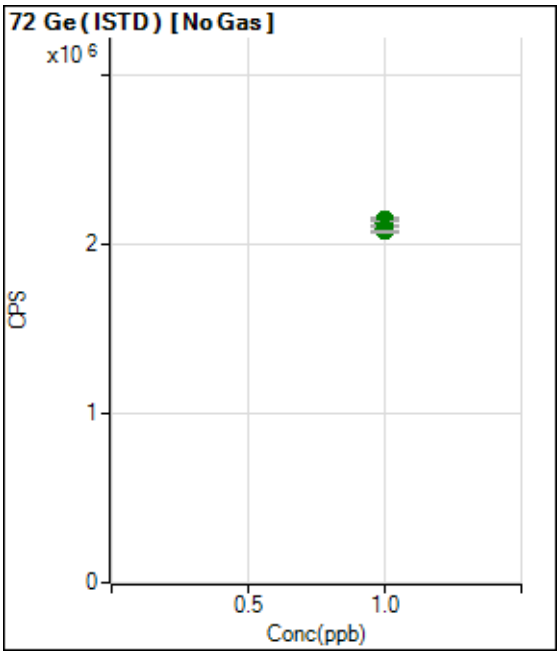
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	40.00	0.0000	P	43.9
2	☐	2.000	1.852	68618.76	0.0268	P	2.1
3	☐	5.000	4.556	171188.53	0.0660	P	2.2
4	☐	10.000	9.419	344517.43	0.1365	P	0.4
5	☐	100.000	101.071	3700484.21	1.4644	A	0.6
6	☐	200.000	199.506	7191373.85	2.8906	A	3.0

y = 0.0145 * x + 1.5811E-005
R = 1.0000
DL = 0.001437
BEC = 0.001091

Weight: <None>
Min Conc: <None>

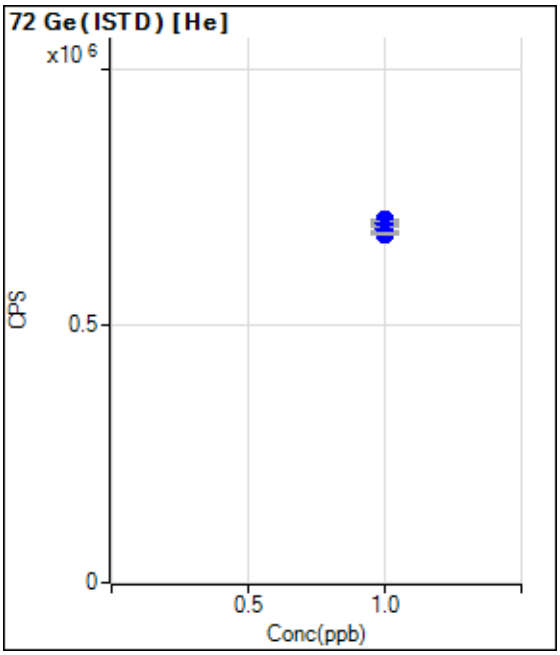


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		851396.56		A	1.0
2	☐	1.000		844098.40		A	1.3
3	☐	1.000		833751.25		A	1.4
4	☐	1.000		834919.48		A	0.8
5	☐	1.000		788191.01		A	2.1
6	☐	1.000		771890.78		A	3.5

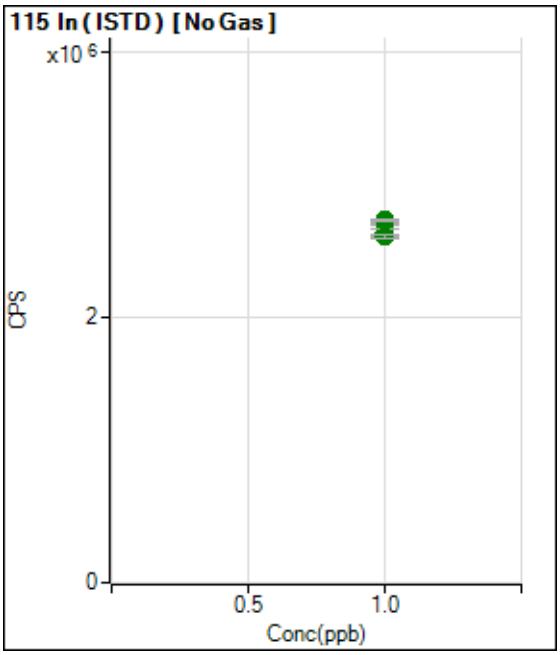


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2139407.73		A	0.4
2	☐	1.000		2145638.15		A	0.9
3	☐	1.000		2144715.12		A	0.8
4	☐	1.000		2124268.15		A	1.2
5	☐	1.000		2092022.57		A	0.9
6	☐	1.000		2076150.54		A	0.9

Calibration for 162_ICV.d

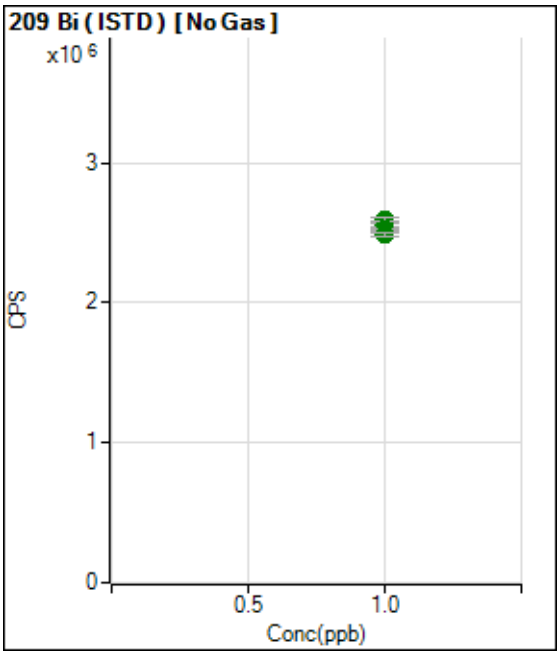


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		694064.57		P	0.3
2	☐	1.000		698154.70		P	0.5
3	☐	1.000		705354.52		P	0.7
4	☐	1.000		698779.05		P	1.1
5	☐	1.000		689128.38		P	1.0
6	☐	1.000		678517.99		P	1.0



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2719437.47		A	1.0
2	☐	1.000		2724329.72		A	1.1
3	☐	1.000		2717717.10		A	0.3
4	☐	1.000		2737982.30		A	0.7
5	☐	1.000		2636127.70		A	2.2
6	☐	1.000		2614362.72		A	1.4

Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2536806.21		A	2.3
2	☐	1.000		2556187.20		A	0.9
3	☐	1.000		2593317.67		A	1.2
4	☐	1.000		2524222.72		A	0.8
5	☐	1.000		2526930.85		A	0.6
6	☐	1.000		2488386.47		A	1.1

Sample Report

Sample Table

Sample Name	LLICCV5
Data File Name	163LCV5.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T20:06:43-06:00
Sample Type	LLCCV5
Dilution	1
Comment	
ISTD Ref FileName	155CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	4.549	4.549	4.50	96917	0.00	5	
Be	9	1	No Gas	4.650	4.650	4.24	12509	0.04	5	
V	51	2	He	4.541	4.541	1.91	26527	0.02	5	
Cr	52	2	He	4.885	4.885	1.07	30768	0.02	5	
Fe	56	2	He	502.943	502.943	2.17	2692481	0.02	500	
Se	78	2	He	5.708	5.708	2.18	735	0.78	5	
As	75	2	He	4.829	4.829	2.16	4406	0.11	5	
Ca	44	2	He	490.925	490.925	2.56	19738	2.49	500	
Na	23	2	He	494.167	494.167	0.76	546676	0.09	500	
Mg	24	2	He	520.025	520.025	0.97	274772	0.19	500	
K	39	2	He	484.552	484.552	1.22	501420	0.10	500	
Mn	55	2	He	4.916	4.916	0.58	24045	0.02	5	
Co	59	2	He	4.844	4.844	0.37	37933	0.01	5	
Ni	60	2	He	4.915	4.915	4.70	9230	0.05	5	
Cu	63	2	He	4.920	4.920	1.14	24419	0.02	5	
Zn	66	2	He	4.602	4.602	2.16	5124	0.09	5	
Al	27	2	He	5.554	5.554	9.21	2844	0.20	5	
B	11	1	No Gas	27.662	27.662	5.30	55643	0.05	25	
Al	27	1	No Gas	5.536	5.536	5.49	88034	0.01	5	
Si	28	1	No Gas	27.649	27.649	8.19	397895	0.01	25	
Ag	107	1	No Gas	4.864	4.864	1.12	66015	0.01	5	
Cd	111	1	No Gas	4.982	4.982	2.75	14034	0.04	5	
Sr	88	1	No Gas	4.722	4.722	0.93	129898	0.00	5	
Mo	95	1	No Gas	4.879	4.879	3.50	25635	0.02	5	
Sn	118	1	No Gas	4.852	4.852	1.32	43663	0.01	5	
Sb	121	1	No Gas	4.878	4.878	3.14	58481	0.01	5	
Ba	137	1	No Gas	4.893	4.893	0.31	22390	0.02	5	
Tl	205	1	No Gas	4.783	4.783	0.97	127974	0.00	5	
Tl	203	1	No Gas	4.779	4.779	2.22	52916	0.01	5	
Pb	208	1	No Gas	4.776	4.776	0.78	175417	0.00	5	
U	238	1	No Gas	4.609	4.609	0.50	174160	0.00	5	
Ca	43	2	He	551.578	551.578	10.67	1270	43.43	500	
Sb	121	2	He	4.735	4.735	1.30	30853	0.02	5	
Ti	47	2	He	4.576	4.576	3.08	957	0.48	5	
Cu	63	1	No Gas	4.876	4.876	3.12	46978	0.01	5	
Se	82	1	No Gas	4.462	4.462	12.85	709	0.63	5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	844628	2.77	851397	99.21	70	120	
Ge	72	2	He	702247	1.36	694065	101.18	70	120	
Ge	72	1	No Gas	2151989	2.67	2139408	100.59	70	120	

Sample Report

In	115	1	No Gas	2722736	1.36	2719437	100.12	70	120	
Bi	209	1	No Gas	2607641	1.38	2536806	102.79	70	120	

Sample Report

Sample Table

Sample Name	LLICCV2
Data File Name	164LCV2.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T20:08:41-06:00
Sample Type	LLCCV2
Dilution	1
Comment	
ISTD Ref FileName	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	2.024	2.024	5.84	68606	0.00	2	
Be	9	1	No Gas	1.857	1.857	3.12	4838	0.04	2	
V	51	2	He	1.670	1.670	4.38	12383	0.01	2	
Cr	52	2	He	1.886	1.886	3.05	14244	0.01	2	
Fe	56	2	He	196.679	196.679	1.49	1061400	0.02	200	
Se	78	2	He	2.241	2.241	9.60	406	0.55	2	
As	75	2	He	1.822	1.822	2.86	1863	0.10	2	
Ca	44	2	He	194.053	194.053	5.61	8139	2.38	200	
Na	23	2	He	187.248	187.248	1.17	278385	0.07	200	
Mg	24	2	He	204.100	204.100	0.99	108127	0.19	200	
K	39	2	He	189.244	189.244	0.95	275057	0.07	200	
Mn	55	2	He	1.861	1.861	5.83	10214	0.02	2	
Co	59	2	He	1.889	1.889	1.63	14818	0.01	2	
Ni	60	2	He	1.914	1.914	4.86	3651	0.05	2	
Cu	63	2	He	1.937	1.937	2.80	10217	0.02	2	
Zn	66	2	He	2.010	2.010	2.17	2390	0.08	2	
Al	27	2	He	2.637	2.637	44.48	1834	0.14	2	NewName Main CR1 Failed
B	11	1	No Gas	12.460	12.460	1.38	30019	0.04	10	
Al	27	1	No Gas	2.136	2.136	1.05	50254	0.00	2	
Si	28	1	No Gas	12.060	12.060	12.76	306843	0.00	10	
Ag	107	1	No Gas	1.943	1.943	3.03	26193	0.01	2	
Cd	111	1	No Gas	1.942	1.942	4.86	5425	0.04	2	
Sr	88	1	No Gas	1.916	1.916	1.11	52962	0.00	2	
Mo	95	1	No Gas	1.937	1.937	3.17	10107	0.02	2	
Sn	118	1	No Gas	1.953	1.953	3.95	18193	0.01	2	
Sb	121	1	No Gas	1.966	1.966	4.75	23408	0.01	2	
Ba	137	1	No Gas	1.977	1.977	2.58	9087	0.02	2	
Tl	205	1	No Gas	1.918	1.918	2.64	50194	0.00	2	
Tl	203	1	No Gas	1.903	1.903	1.83	20624	0.01	2	
Pb	208	1	No Gas	1.933	1.933	2.03	69747	0.00	2	
U	238	1	No Gas	1.827	1.827	1.39	67486	0.00	2	
Ca	43	2	He	182.935	182.935	3.73	437	41.89	200	
Sb	121	2	He	1.903	1.903	1.39	12530	0.02	2	
Ti	47	2	He	2.167	2.167	26.00	460	0.47	200	
Cu	63	1	No Gas	1.923	1.923	4.23	19624	0.01	2	
Se	82	1	No Gas	1.572	1.572	46.66	215	0.73	2	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	816496	1.17	851397	95.90	70	120	
Ge	72	2	He	702300	0.17	694065	101.19	70	120	
Ge	72	1	No Gas	2113538	0.19	2139408	98.79	70	120	
In	115	1	No Gas	2695718	1.44	2719437	99.13	70	120	
Bi	209	1	No Gas	2548095	0.52	2536806	100.45	70	120	

Initial Calibration Blank (ICB) Report

Sample Table

Sample Name	ICCB
Data File Name	165_ICB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T20:10:39-06:00
Sample Type	ICB
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Li	7	1	No Gas	0.107	107.5	50532	1.2	0.5	
Be	9	1	No Gas	0.011	48.4	40	33.1	0.5	
V	51	2	He	-0.254	-11.4	2903	5.2	2.5	
Cr	52	2	He	0.054	65.0	4154	5.2	2.5	
Fe	56	2	He	0.673	21.2	17198	4.4	100	
Se	78	2	He	0.296	62.1	222	8.0	1	
As	75	2	He	-0.072	-22.5	261	5.8	2.5	
Ca	44	2	He	5.773	65.6	780	19.0	100	
Na	23	2	He	-16.340	-7.0	100510	1.2	100	
Mg	24	2	He	0.342	57.4	630	16.5	100	
K	39	2	He	-8.084	-23.4	123921	1.5	100	
Mn	55	2	He	-0.018	-9.0	1707	0.9	2.5	
Co	59	2	He	0.007	61.6	90	38.5	2.5	
Ni	60	2	He	0.119	30.0	313	21.3	2.5	
Cu	63	2	He	0.001	2037.6	1000	7.2	1	
Zn	66	2	He	0.000	-127878.1	270	32.9	2.5	
Al	27	2	He	2.196	5.1	1683	1.9	5	
B	11	1	No Gas	2.637	1.0	14933	1.6	0.5	ICB Main CR1 Failed
Al	27	1	No Gas	1.969	0.3	49070	0.7	5	
Si	28	1	No Gas	1.351	123.9	252026	3.1	10	
Ag	107	1	No Gas	0.004	137.1	213	33.3	2.5	
Cd	111	1	No Gas	-0.002	-173.3	7	173.2	1	
Sr	88	1	No Gas	0.040	25.5	2420	11.4	2.5	
Mo	95	1	No Gas	0.008	34.3	93	16.4	2.5	
Sn	118	1	No Gas	0.059	11.3	1830	2.7	5	
Sb	121	1	No Gas	0.033	12.4	820	6.5	2.5	
Ba	137	1	No Gas	0.035	67.1	377	29.1	2.5	
Tl	205	1	No Gas	0.012	2.4	410	2.4	1	
Tl	203	1	No Gas	0.016	23.0	220	18.2	1	
Pb	208	1	No Gas	0.020	19.1	1367	9.4	2.5	
U	238	1	No Gas	0.005	25.4	240	22.0	2.5	
Ca	43	2	He	16.118	83.1	60	50.0	100	
Sb	121	2	He	0.028	10.3	400	4.3	2.5	
Ti	47	2	He	0.015	183.1	17	34.6	2.5	
Se	82	1	No Gas	-0.636	-68.3	-155	-46.6	1	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	832914	1.67	851397	97.83	70	120	
Ge	72	2	He	703267	0.50	694065	101.33	70	120	
Ge	72	1	No Gas	2139297	0.57	2139408	99.99	70	120	
In	115	1	No Gas	2706418	1.67	2719437	99.52	70	120	
Bi	209	1	No Gas	2527899	0.78	2536806	99.65	70	120	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	201_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:21:16-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Li	7	1	No Gas	100.346	1.318	1037588	0.99	100	100.3	90	110	
Be	9	1	No Gas	98.829	1.285	254712	0.37	100	98.8	90	110	
V	51	2	He	99.066	0.221	487838	0.21	100	99.1	90	110	
Cr	52	2	He	99.076	0.287	544789	0.44	100	99.1	90	110	
Fe	56	2	He	10015.831	1.403	52880604	1.54	10000	100.2	90	110	
Se	78	2	He	99.309	0.905	9517	0.95	100	99.3	90	110	
As	75	2	He	100.043	0.884	84181	1.08	100	100.0	90	110	
Ca	44	2	He	9928.839	1.270	385079	1.37	10000	99.3	90	110	
Na	23	2	He	9929.683	1.747	8715766	1.91	10000	99.3	90	110	
Mg	24	2	He	10144.391	0.325	5302919	0.53	10000	101.4	90	110	
K	39	2	He	9852.083	1.352	7613461	1.53	10000	98.5	90	110	
Mn	55	2	He	100.890	0.840	454386	0.87	100	100.9	90	110	
Co	59	2	He	97.140	1.468	753140	1.60	100	97.1	90	110	
Ni	60	2	He	101.370	0.630	186867	0.83	100	101.4	90	110	
Cu	63	2	He	100.733	0.203	476203	0.30	100	100.7	90	110	
Zn	66	2	He	100.732	1.172	105575	1.25	100	100.7	90	110	
Al	27	2	He	103.266	2.259	36344	2.29	100	103.3	90	110	
B	11	1	No Gas	475.515	1.682	748654	0.96	500	95.1	90	110	
Al	27	1	No Gas	102.680	2.486	1112980	1.87	100	102.7	90	110	
Si	28	1	No Gas	508.763	0.098	2962910	0.51	5000	10.2	90	110	CCV Main CR1-2 Failed
Ag	107	1	No Gas	99.226	1.978	1309174	1.26	100	99.2	90	110	
Cd	111	1	No Gas	100.668	1.731	276137	1.07	100	100.7	90	110	
Sr	88	1	No Gas	98.633	3.115	2617745	2.42	100	98.6	90	110	
Mo	95	1	No Gas	98.439	2.129	503048	1.62	100	98.4	90	110	
Sn	118	1	No Gas	99.252	1.819	845372	1.21	100	99.3	90	110	
Sb	121	1	No Gas	99.802	0.465	1157570	1.06	100	99.8	90	110	
Ba	137	1	No Gas	99.035	1.088	437501	0.53	100	99.0	90	110	
Tl	205	1	No Gas	104.796	2.359	2683340	1.18	100	104.8	90	110	
Tl	203	1	No Gas	100.009	1.819	1059434	0.63	100	100.0	90	110	
Pb	208	1	No Gas	99.308	1.702	3480184	0.91	100	99.3	90	110	
U	238	1	No Gas	101.721	1.264	3680895	1.45	100	101.7	90	110	
Ca	43	2	He	10185.058	3.811	22809	3.94	10000	101.9	90	110	
Sb	121	2	He	97.071	0.703	622623	0.71	100	97.1	90	110	
Ti	47	2	He	98.757	0.608	20182	0.66	100	98.8	90	110	
Cu	63	1	No Gas	99.285	0.789	886912	0.80	100	99.3	90	110	
Se	82	1	No Gas	100.009	1.433	16500	1.85	100	100.0	90	110	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	809585	1.18	851397	95.09	70	120	
Ge	72	2	He	695807	0.20	694065	100.25	70	120	
Ge	72	1	No Gas	2095745	0.60	2139408	97.96	70	120	
In	115	1	No Gas	2653269	0.73	2719437	97.57	70	120	
Bi	209	1	No Gas	2497555	1.20	2536806	98.45	70	120	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	202_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:23:10-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Li	7	1	No Gas	0.149	28.9	50611	0.4	0.5	
Be	9	1	No Gas	0.065	31.3	182	29.4	0.5	
V	51	2	He	-0.074	-27.8	3782	2.7	2.5	
Cr	52	2	He	0.025	351.3	3981	11.8	2.5	
Fe	56	2	He	2.489	12.7	26820	6.5	100	
Se	78	2	He	0.309	47.1	223	5.8	2	
As	75	2	He	-0.045	-108.2	283	14.7	2.5	
Ca	44	2	He	-1.270	-151.0	503	15.4	100	
Na	23	2	He	-18.376	-15.1	98475	2.1	100	
Mg	24	2	He	2.621	23.7	1830	18.4	100	
K	39	2	He	-5.302	-28.3	125738	0.4	100	
Mn	55	2	He	-0.026	-116.4	1667	8.2	2.5	
Co	59	2	He	0.030	12.4	270	11.1	2.5	
Ni	60	2	He	0.043	91.6	170	42.4	2.5	
Cu	63	2	He	0.005	405.0	1017	9.3	2	
Zn	66	2	He	0.114	54.0	390	16.8	2.5	
Al	27	2	He	-0.915	-7.4	603	3.8	5	
B	11	1	No Gas	4.741	10.2	18165	4.0	0.5	CCB Main CR1 Failed
Al	27	1	No Gas	-0.775	-8.5	19527	1.3	5	
Si	28	1	No Gas	2.647	66.4	260236	0.6	10	
Ag	107	1	No Gas	0.063	22.4	1000	16.7	2.5	
Cd	111	1	No Gas	0.046	43.6	140	37.8	1	
Sr	88	1	No Gas	0.046	35.5	2570	15.2	2.5	
Mo	95	1	No Gas	0.087	42.8	497	36.7	2.5	
Sn	118	1	No Gas	0.112	12.1	2274	3.3	5	
Sb	121	1	No Gas	0.111	13.5	1753	9.1	2.5	
Ba	137	1	No Gas	0.073	51.0	540	28.5	2.5	
Tl	205	1	No Gas	0.117	27.6	3164	26.8	1	
Tl	203	1	No Gas	0.119	22.6	1340	21.0	1	
Pb	208	1	No Gas	0.088	23.3	3810	17.5	2.5	
U	238	1	No Gas	0.064	24.5	2417	23.5	2.5	
Ca	43	2	He	8.750	58.5	43	26.6	100	
Sb	121	2	He	0.062	2.2	613	1.9	2.5	
Ti	47	2	He	-0.017	-285.5	10	100.0	2.5	
Cu	63	1	No Gas	0.019	90.3	2564	3.2	2.5	
Se	82	1	No Gas	-0.603	-88.2	-149	-58.4	2	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	827142	0.80	851397	97.15	70	120	
Ge	72	2	He	701525	0.54	694065	101.07	70	120	
Ge	72	1	No Gas	2149992	3.21	2139408	100.49	70	120	
In	115	1	No Gas	2690073	2.37	2719437	98.92	70	120	
Bi	209	1	No Gas	2560364	3.17	2536806	100.93	70	120	

Sample Report

Sample Table

Sample Name	MBLK-173565
Data File Name	203SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:25:13-06:00
Sample Type	Sample
Dilution	1
Comment	DOD TW 173565
ISTD Ref FileName	155CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	-0.058	-0.058	-180.83	51194	0.00	2000	
Be	9	1	No Gas	0.010	0.010	82.23	40	0.03	2000	
V	51	2	He	-0.052	-0.052	-43.49	3928	0.00	2000	
Cr	52	2	He	0.011	0.011	482.44	3941	0.00	2000	
Fe	56	2	He	2.320	2.320	4.60	26169	0.01	200000	
Se	78	2	He	-0.035	-0.035	-1151.08	192	-0.02	2000	
As	75	2	He	-0.041	-0.041	-167.43	289	-0.01	2000	
Ca	44	2	He	2.507	2.507	74.85	657	0.38	200000	
Na	23	2	He	-20.661	-20.661	-5.27	97408	-0.02	200000	
Mg	24	2	He	7.891	7.891	1.86	4651	0.17	200000	
K	39	2	He	-7.527	-7.527	-14.73	125223	-0.01	200000	
Mn	55	2	He	-0.018	-0.018	-124.62	1720	0.00	2000	
Co	59	2	He	0.036	0.036	10.26	320	0.01	2000	
Ni	60	2	He	0.038	0.038	45.17	163	0.02	2000	
Cu	63	2	He	0.053	0.053	25.08	1257	0.00	2000	
Zn	66	2	He	0.277	0.277	46.54	567	0.05	2000	
Al	27	2	He	3.659	3.659	11.06	2207	0.17	2000	
B	11	1	No Gas	2.585	2.585	8.88	15557	0.02	2000	
Al	27	1	No Gas	3.534	3.534	0.34	66747	0.01	2000	
Si	28	1	No Gas	29.518	29.518	0.71	410815	0.01	2000	
Ag	107	1	No Gas	0.017	0.017	2.62	387	0.00	2000	
Cd	111	1	No Gas	0.009	0.009	63.50	40	0.02	2000	
Sr	88	1	No Gas	0.017	0.017	15.48	1817	0.00	2000	
Mo	95	1	No Gas	0.016	0.016	49.04	133	0.01	2000	
Sn	118	1	No Gas	0.038	0.038	18.93	1660	0.00	2000	
Sb	121	1	No Gas	0.027	0.027	23.84	760	0.00	2000	
Ba	137	1	No Gas	0.051	0.051	14.88	450	0.01	2000	
Tl	205	1	No Gas	0.020	0.020	28.03	617	0.00	2000	
Tl	203	1	No Gas	0.022	0.022	10.26	303	0.01	2000	
Pb	208	1	No Gas	0.019	0.019	8.64	1380	0.00	2000	
U	238	1	No Gas	0.009	0.009	30.15	377	0.00	2000	
Ca	43	2	He	8.551	8.551	106.36	43	19.73	200000	
Sb	121	2	He	0.021	0.021	28.50	357	0.01	2000	
Ti	47	2	He	-0.001	-0.001	-6256.31	13	-0.01	2000	
Cu	63	1	No Gas	0.032	0.032	15.65	2697	0.00	2000	
Zn	66	1	No Gas	0.280	0.280	31.04	1353	0.02	2000	
Se	82	1	No Gas	-0.466	-0.466	-80.72	-129	0.36	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	872724	1.28	851397	102.51	70	120	
Ge	72	2	He	708232	0.32	694065	102.04	70	120	
Ge	72	1	No Gas	2164901	0.96	2139408	101.19	70	120	
In	115	1	No Gas	2725929	0.88	2719437	100.24	70	120	

Sample Report

Bi	209	1	No Gas	2611568	0.43	2536806	102.95	70	120	

Sample Report

Sample Table

Sample Name	LCS-173565
Data File Name	204SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:27:17-06:00
Sample Type	Sample
Dilution	1
Comment	DOD TW 173565
ISTD Ref FileName	155CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	0.104	0.104	63.77	52767	0.00	2000	
Be	9	1	No Gas	51.933	51.933	2.31	143856	0.04	2000	
V	51	2	He	52.254	52.254	0.75	270782	0.02	2000	
Cr	52	2	He	52.093	52.093	0.28	301077	0.02	2000	
Fe	56	2	He	5194.185	5194.185	0.51	28650546	0.02	200000	
Se	78	2	He	55.627	55.627	1.15	5657	0.98	2000	
As	75	2	He	53.066	53.066	0.70	46792	0.11	2000	
Ca	44	2	He	5163.830	5163.830	0.95	209442	2.47	200000	
Na	23	2	He	5277.601	5277.601	1.84	4893358	0.11	200000	
Mg	24	2	He	5391.664	5391.664	1.75	2943728	0.18	200000	
K	39	2	He	5230.840	5230.840	2.50	4284537	0.12	200000	
Mn	55	2	He	53.395	53.395	0.65	252041	0.02	2000	
Co	59	2	He	52.336	52.336	0.83	423846	0.01	2000	
Ni	60	2	He	53.957	53.957	1.48	103937	0.05	2000	
Cu	63	2	He	55.036	55.036	1.20	272199	0.02	2000	
Zn	66	2	He	56.851	56.851	1.20	62353	0.09	2000	
Al	27	2	He	121.281	121.281	3.14	44408	0.27	2000	
B	11	1	No Gas	1.673	1.673	20.81	13987	0.01	2000	
Al	27	1	No Gas	121.308	121.308	1.69	1399456	0.01	2000	
Si	28	1	No Gas	89.226	89.226	0.57	766232	0.01	2000	
Ag	107	1	No Gas	53.631	53.631	0.37	730610	0.01	2000	
Cd	111	1	No Gas	54.677	54.677	1.33	154841	0.04	2000	
Sr	88	1	No Gas	0.059	0.059	9.27	2977	0.00	2000	
Mo	95	1	No Gas	53.194	53.194	0.55	280671	0.02	2000	
Sn	118	1	No Gas	0.201	0.201	14.32	3097	0.01	2000	
Sb	121	1	No Gas	51.463	51.463	0.85	637826	0.01	2000	
Ba	137	1	No Gas	53.442	53.442	0.21	243834	0.02	2000	
Tl	205	1	No Gas	53.194	53.194	2.46	1430261	0.00	2000	
Tl	203	1	No Gas	52.115	52.115	2.60	579551	0.01	2000	
Pb	208	1	No Gas	52.255	52.255	2.36	1922666	0.00	2000	
U	238	1	No Gas	0.004	0.004	6.63	180	0.00	2000	
Ca	43	2	He	5325.785	5325.785	4.86	12466	42.72	200000	
Sb	121	2	He	51.291	51.291	0.48	343719	0.01	2000	
Ti	47	2	He	51.204	51.204	2.96	10935	0.47	2000	
Cu	63	1	No Gas	53.020	53.020	0.80	507105	0.01	2000	
Zn	66	1	No Gas	55.492	55.492	1.76	148059	0.04	2000	
Se	82	1	No Gas	55.409	55.409	2.02	9743	0.57	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	870213	1.53	851397	102.21	70	120	
Ge	72	2	He	726757	1.01	694065	104.71	70	120	
Ge	72	1	No Gas	2238743	0.29	2139408	104.64	70	120	
In	115	1	No Gas	2739026	0.52	2719437	100.72	70	120	

Sample Report

Bi	209	1	No Gas	2622269	2.09	2536806	103.37	70	120	

Sample Report

Sample Table

Sample Name	HS21120092-05SD
Data File Name	206SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:31:24-06:00
Sample Type	Sample
Dilution	5
Comment	DOD TW 173565
ISTD Ref FileName	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	66.526	332.632	2.28	668607	0.01	2000	
Be	9	1	No Gas	1.465	7.326	6.49	3595	0.04	2000	
V	51	2	He	0.884	4.421	1.59	8257	0.01	2000	
Cr	52	2	He	0.150	0.748	78.98	4538	0.00	2000	
Fe	56	2	He	43.104	215.521	4.69	236030	0.02	200000	
Se	78	2	He	6.612	33.062	4.09	796	0.83	2000	
As	75	2	He	0.325	1.626	4.66	579	0.06	2000	
Ca	44	2	He	79885.975	399429.874	2.49	3030444	2.64	200000	
Na	23	2	He	27414.060	137070.300	0.92	23370837	0.12	200000	
Mg	24	2	He	34520.054	172600.269	1.18	17672256	0.20	200000	
K	39	2	He	1489.946	7449.730	0.80	1234698	0.12	200000	
Mn	55	2	He	530.432	2652.162	1.06	2332360	0.02	2000	
Co	59	2	He	27.574	137.871	0.54	209413	0.01	2000	
Ni	60	2	He	135.103	675.513	0.80	243894	0.06	2000	
Cu	63	2	He	0.987	4.936	3.53	5528	0.02	2000	
Zn	66	2	He	87.840	439.198	0.41	90205	0.10	2000	
Al	27	2	He	3624.977	18124.883	1.16	1219068	0.30	2000	>LDR
B	11	1	No Gas	230.158	1150.790	2.73	349197	0.07	2000	
Al	27	1	No Gas	3463.424	17317.121	1.46	35531778	0.01	2000	>LDR
Si	28	1	No Gas	2332.020	11660.101	0.59	12333617	0.02	2000	>LDR
Ag	107	1	No Gas	0.019	0.093	27.15	387	0.00	2000	
Cd	111	1	No Gas	1.461	7.303	5.00	3864	0.04	2000	
Sr	88	1	No Gas	339.696	1698.478	1.70	8667500	0.00	2000	
Mo	95	1	No Gas	0.075	0.373	8.71	413	0.02	2000	
Sn	118	1	No Gas	0.010	0.052	205.99	1327	0.00	2000	
Sb	121	1	No Gas	0.040	0.202	17.68	863	0.00	2000	
Ba	137	1	No Gas	2.121	10.604	1.69	9210	0.02	2000	
Tl	205	1	No Gas	0.059	0.295	7.85	1613	0.00	2000	
Tl	203	1	No Gas	0.055	0.274	3.50	640	0.01	2000	
Pb	208	1	No Gas	0.144	0.719	7.07	5754	0.00	2000	
U	238	1	No Gas	0.441	2.203	1.50	16154	0.00	2000	
Ca	43	2	He	79296.835	396484.174	1.52	173769	45.63	200000	
Sb	121	2	He	0.048	0.242	30.69	513	0.01	2000	
Ti	47	2	He	0.134	0.672	133.44	40	0.34	2000	
Cu	63	1	No Gas	1.148	5.739	5.61	12169	0.01	2000	
Zn	66	1	No Gas	87.295	436.474	1.92	211031	0.04	2000	
Se	82	1	No Gas	5.949	29.743	2.87	909	0.65	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	768930	1.90	851397	90.31	70	120	
Ge	72	2	He	681506	0.72	694065	98.19	70	120	
Ge	72	1	No Gas	2031805	0.82	2139408	94.97	70	120	
In	115	1	No Gas	2551278	1.00	2719437	93.82	70	120	

Sample Report

Bi	209	1	No Gas	2524832	3.19	2536806	99.53	70	120	

Sample Report

Sample Table

Sample Name	HS21120092-05MS
Data File Name	207SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:33:25-06:00
Sample Type	Sample
Dilution	1
Comment	DOD TW 173565
ISTD Ref FileName	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	442.441	442.441	1.35	3865355	0.01	2000	
Be	9	1	No Gas	61.723	61.723	1.36	139406	0.04	2000	
V	51	2	He	53.167	53.167	0.52	247236	0.02	2000	
Cr	52	2	He	51.538	51.538	0.74	267408	0.02	2000	
Fe	56	2	He	5279.534	5279.534	0.71	26138648	0.02	200000	
Se	78	2	He	99.315	99.315	1.78	8922	1.11	2000	
As	75	2	He	56.419	56.419	1.27	44639	0.13	2000	
Ca	44	2	He	517807.964	517807.964	0.73	18800895	2.75	200000	>LDR
Na	23	2	He	180405.827	180405.827	0.66	146623301	0.12	200000	>LDR
Mg	24	2	He	225650.105	225650.105	0.88	110573368	0.20	200000	>LDR
K	39	2	He	14327.794	14327.794	0.77	10325585	0.14	200000	
Mn	55	2	He	3341.968	3341.968	0.93	14056921	0.02	2000	>LDR
Co	59	2	He	233.425	233.425	0.27	1696646	0.01	2000	
Ni	60	2	He	931.347	931.347	0.98	1608861	0.06	2000	
Cu	63	2	He	56.546	56.546	0.70	251008	0.02	2000	
Zn	66	2	He	582.778	582.778	0.90	571416	0.10	2000	
Al	27	2	He	23069.406	23069.406	0.56	7421730	0.31	2000	>LDR
B	11	1	No Gas	1439.408	1439.408	2.46	1967325	0.07	2000	
Al	27	1	No Gas	21615.314	21615.314	2.03	217161223	0.01	2000	>LDR
Si	28	1	No Gas	14884.683	14884.683	1.76	75917391	0.02	2000	>LDR
Ag	107	1	No Gas	47.438	47.438	1.87	595322	0.01	2000	
Cd	111	1	No Gas	60.485	60.485	2.97	157754	0.04	2000	
Sr	88	1	No Gas	2096.675	2096.675	1.31	52913039	0.00	2000	>LDR
Mo	95	1	No Gas	52.030	52.030	2.40	252880	0.02	2000	
Sn	118	1	No Gas	0.032	0.032	22.55	1487	0.00	2000	
Sb	121	1	No Gas	52.555	52.555	1.02	579332	0.01	2000	
Ba	137	1	No Gas	64.194	64.194	2.48	269740	0.02	2000	
Tl	205	1	No Gas	54.138	54.138	2.81	1282581	0.00	2000	
Tl	203	1	No Gas	53.080	53.080	1.25	520256	0.01	2000	
Pb	208	1	No Gas	52.743	52.743	2.51	1710304	0.00	2000	
U	238	1	No Gas	2.973	2.973	2.55	99556	0.00	2000	
Ca	43	2	He	549699.901	549699.901	1.15	1152906	47.68	200000	>LDR
Sb	121	2	He	51.300	51.300	0.63	308580	0.02	2000	
Ti	47	2	He	51.925	51.925	0.67	9954	0.52	2000	
Cu	63	1	No Gas	55.113	55.113	2.62	468653	0.01	2000	
Zn	66	1	No Gas	585.670	585.670	1.47	1384608	0.04	2000	
Se	82	1	No Gas	98.594	98.594	2.43	15451	0.64	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	709418	0.68	851397	83.32	70	120	
Ge	72	2	He	652324	0.77	694065	93.99	70	120	
Ge	72	1	No Gas	1991373	2.21	2139408	93.08	70	120	
In	115	1	No Gas	2524257	3.61	2719437	92.82	70	120	
Bi	209	1	No Gas	2310532	0.69	2536806	91.08	70	120	

Sample Report

Sample Table

Sample Name	HS21120092-05MSD
Data File Name	208SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:35:29-06:00
Sample Type	Sample
Dilution	1
Comment	DOD TW 173565
ISTD Ref FileName	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	452.893	452.893	1.26	3867188	0.01	2000	
Be	9	1	No Gas	63.326	63.326	1.03	139806	0.05	2000	
V	51	2	He	53.463	53.463	0.93	249276	0.02	2000	
Cr	52	2	He	51.312	51.312	0.50	266975	0.02	2000	
Fe	56	2	He	5342.566	5342.566	0.49	26525573	0.02	200000	
Se	78	2	He	100.804	100.804	1.56	9079	1.11	2000	
As	75	2	He	56.877	56.877	0.16	45122	0.13	2000	
Ca	44	2	He	529430.397	529430.397	1.19	19277159	2.75	200000	>LDR
Na	23	2	He	183887.344	183887.344	0.48	149865424	0.12	200000	>LDR
Mg	24	2	He	228402.529	228402.529	1.10	112228255	0.20	200000	>LDR
K	39	2	He	14577.461	14577.461	1.71	10530993	0.14	200000	
Mn	55	2	He	3392.986	3392.986	0.96	14311266	0.02	2000	>LDR
Co	59	2	He	237.049	237.049	0.67	1727737	0.01	2000	
Ni	60	2	He	941.102	941.102	1.70	1630169	0.06	2000	
Cu	63	2	He	56.906	56.906	1.25	253287	0.02	2000	
Zn	66	2	He	590.633	590.633	1.73	580660	0.10	2000	
Al	27	2	He	23364.537	23364.537	2.41	7535872	0.31	2000	>LDR
B	11	1	No Gas	1508.017	1508.017	1.69	2014419	0.07	2000	
Al	27	1	No Gas	22590.475	22590.475	2.10	223622017	0.01	2000	>LDR
Si	28	1	No Gas	15343.040	15343.040	2.05	77090659	0.02	2000	>LDR
Ag	107	1	No Gas	48.767	48.767	1.56	601313	0.01	2000	
Cd	111	1	No Gas	62.770	62.770	0.93	160912	0.04	2000	
Sr	88	1	No Gas	2195.744	2195.744	1.98	54429829	0.00	2000	>LDR
Mo	95	1	No Gas	54.169	54.169	2.86	258639	0.02	2000	
Sn	118	1	No Gas	0.029	0.029	45.95	1433	0.00	2000	
Sb	121	1	No Gas	54.481	54.481	1.51	591602	0.01	2000	
Ba	137	1	No Gas	66.765	66.765	1.12	275678	0.02	2000	
Tl	205	1	No Gas	54.890	54.890	2.84	1307992	0.00	2000	
Tl	203	1	No Gas	54.320	54.320	1.85	535531	0.01	2000	
Pb	208	1	No Gas	53.657	53.657	1.24	1750169	0.00	2000	
U	238	1	No Gas	3.012	3.012	1.76	101472	0.00	2000	
Ca	43	2	He	565781.837	565781.837	1.61	1190152	47.54	200000	>LDR
Sb	121	2	He	52.020	52.020	1.57	313737	0.02	2000	
Ti	47	2	He	52.370	52.370	4.21	10064	0.52	2000	
Cu	63	1	No Gas	57.007	57.007	1.68	477564	0.01	2000	
Zn	66	1	No Gas	614.073	614.073	1.47	1429796	0.04	2000	
Se	82	1	No Gas	98.378	98.378	2.79	15194	0.65	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	693442	1.41	851397	81.45	70	120	
Ge	72	2	He	654157	1.47	694065	94.25	70	120	
Ge	72	1	No Gas	1961696	0.89	2139408	91.69	70	120	
In	115	1	No Gas	2479613	2.15	2719437	91.18	70	120	
Bi	209	1	No Gas	2324051	0.60	2536806	91.61	70	120	

Sample Report

Sample Table

Sample Name	HS21120092-05PDS
Data File Name	209SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:37:33-06:00
Sample Type	Sample
Dilution	1
Comment	DOD TW 173565
ISTD Ref FileName	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	451.352	451.352	1.83	3725317	0.01	2000	
Be	9	1	No Gas	131.074	131.074	0.96	279728	0.05	2000	
V	51	2	He	122.456	122.456	0.98	547689	0.02	2000	
Cr	52	2	He	117.537	117.537	0.96	587304	0.02	2000	
Fe	56	2	He	11892.679	11892.679	0.28	57121587	0.02	200000	
Se	78	2	He	176.520	176.520	0.58	15254	1.16	2000	
As	75	2	He	129.312	129.312	0.53	98901	0.13	2000	
Ca	44	2	He	533826.276	533826.276	0.81	18808046	2.84	200000	>LDR
Na	23	2	He	191777.635	191777.635	1.93	151248098	0.13	200000	>LDR
Mg	24	2	He	235524.249	235524.249	1.20	111989212	0.21	200000	>LDR
K	39	2	He	21144.309	21144.309	2.36	14728095	0.14	200000	
Mn	55	2	He	3489.487	3489.487	0.87	14243448	0.02	2000	>LDR
Co	59	2	He	305.181	305.181	1.05	2152688	0.01	2000	
Ni	60	2	He	1009.619	1009.619	1.15	1692506	0.06	2000	
Cu	63	2	He	121.732	121.732	0.92	523327	0.02	2000	
Zn	66	2	He	652.998	652.998	0.31	621285	0.11	2000	
Al	27	2	He	23261.201	23261.201	2.81	7260256	0.32	2000	>LDR
B	11	1	No Gas	1510.863	1510.863	2.67	1951265	0.08	2000	
Al	27	1	No Gas	22136.400	22136.400	1.64	216239243	0.01	2000	>LDR
Si	28	1	No Gas	15001.901	15001.901	0.70	74392132	0.02	2000	>LDR
Ag	107	1	No Gas	87.533	87.533	0.45	1068854	0.01	2000	
Cd	111	1	No Gas	127.193	127.193	0.93	322872	0.04	2000	
Sr	88	1	No Gas	2158.430	2158.430	1.22	52988851	0.00	2000	>LDR
Mo	95	1	No Gas	121.582	121.582	0.96	574965	0.02	2000	
Sn	118	1	No Gas	0.080	0.080	24.03	1820	0.00	2000	
Sb	121	1	No Gas	122.086	122.086	1.68	1307756	0.01	2000	
Ba	137	1	No Gas	133.999	133.999	1.80	547747	0.02	2000	
Tl	205	1	No Gas	124.559	124.559	3.74	2956022	0.00	2000	
Tl	203	1	No Gas	122.981	122.981	2.93	1207532	0.01	2000	
Pb	208	1	No Gas	121.278	121.278	2.97	3939155	0.00	2000	
U	238	1	No Gas	2.982	2.982	2.78	100057	0.00	2000	
Ca	43	2	He	572635.599	572635.599	2.40	1165253	49.14	200000	>LDR
Sb	121	2	He	118.816	118.816	1.72	693201	0.02	2000	
Ti	47	2	He	120.927	120.927	2.06	22482	0.54	2000	
Cu	63	1	No Gas	117.349	117.349	0.49	967808	0.01	2000	
Zn	66	1	No Gas	666.651	666.651	1.08	1531829	0.04	2000	
Se	82	1	No Gas	171.000	171.000	1.39	26085	0.66	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	670369	1.61	851397	78.74	70	120	
Ge	72	2	He	633021	1.22	694065	91.20	70	120	
Ge	72	1	No Gas	1935680	1.28	2139408	90.48	70	120	
In	115	1	No Gas	2455361	1.75	2719437	90.29	70	120	
Bi	209	1	No Gas	2315415	1.73	2536806	91.27	70	120	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	210_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:39:32-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Li	7	1	No Gas	98.441	3.161	901616	1.43	100	98.4	90	110	
Be	9	1	No Gas	98.115	1.568	223827	0.50	100	98.1	90	110	
V	51	2	He	97.700	0.476	448880	0.68	100	97.7	90	110	
Cr	52	2	He	97.358	0.945	499482	1.09	100	97.4	90	110	
Fe	56	2	He	9910.602	0.748	48812449	0.46	10000	99.1	90	110	
Se	78	2	He	100.647	0.784	8996	0.33	100	100.6	90	110	
As	75	2	He	99.361	0.243	77999	0.92	100	99.4	90	110	
Ca	44	2	He	9840.710	1.246	356034	0.45	10000	98.4	90	110	
Na	23	2	He	9851.863	1.738	8067258	0.99	10000	98.5	90	110	
Mg	24	2	He	9882.625	1.725	4819278	1.54	10000	98.8	90	110	
K	39	2	He	9613.318	2.198	6932656	1.54	10000	96.1	90	110	
Mn	55	2	He	100.705	0.884	423147	1.69	100	100.7	90	110	
Co	59	2	He	96.675	0.734	699218	0.12	100	96.7	90	110	
Ni	60	2	He	100.660	0.820	173103	0.69	100	100.7	90	110	
Cu	63	2	He	100.111	0.419	441509	0.57	100	100.1	90	110	
Zn	66	2	He	101.452	1.216	99188	0.51	100	101.5	90	110	
Al	27	2	He	105.005	2.345	34467	3.12	100	105.0	90	110	
B	11	1	No Gas	498.177	2.194	693762	0.59	500	99.6	90	110	
Al	27	1	No Gas	115.362	8.482	1178614	6.22	100	115.4	90	110	CCV Main CR1-2 Failed
Si	28	1	No Gas	490.524	3.091	2709720	0.82	5000	9.8	90	110	CCV Main CR1-2 Failed
Ag	107	1	No Gas	101.797	1.485	1294458	1.26	100	101.8	90	110	
Cd	111	1	No Gas	100.993	0.542	266996	0.25	100	101.0	90	110	
Sr	88	1	No Gas	99.128	1.359	2535925	1.76	100	99.1	90	110	
Mo	95	1	No Gas	97.360	1.283	479512	1.07	100	97.4	90	110	
Sn	118	1	No Gas	98.664	0.220	809959	0.76	100	98.7	90	110	
Sb	121	1	No Gas	103.373	2.951	1133881	1.42	100	103.4	90	110	
Ba	137	1	No Gas	101.169	0.268	430730	0.31	100	101.2	90	110	
Tl	205	1	No Gas	102.908	2.680	2641125	1.50	100	102.9	90	110	
Tl	203	1	No Gas	100.524	1.662	1067427	0.84	100	100.5	90	110	
Pb	208	1	No Gas	99.968	0.380	3512027	1.34	100	100.0	90	110	
U	238	1	No Gas	101.813	1.115	3692688	0.27	100	101.8	90	110	
Ca	43	2	He	9980.839	1.525	20853	2.01	10000	99.8	90	110	
Sb	121	2	He	99.344	1.561	594397	0.72	100	99.3	90	110	
Ti	47	2	He	95.560	0.180	18219	1.02	100	95.6	90	110	
Cu	63	1	No Gas	97.313	2.127	822237	0.63	100	97.3	90	110	
Se	82	1	No Gas	98.942	3.219	15438	2.46	100	98.9	90	110	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	716641	1.61	851397	84.17	70	120	
Ge	72	2	He	649127	0.85	694065	93.53	70	120	
Ge	72	1	No Gas	1982705	2.01	2139408	92.68	70	120	
In	115	1	No Gas	2557039	0.57	2719437	94.03	70	120	
Bi	209	1	No Gas	2503461	1.30	2536806	98.69	70	120	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	211_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:41:26-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Li	7	1	No Gas	0.555	18.8	48396	0.9	0.5	CCB Main CR1 Failed
Be	9	1	No Gas	0.087	26.8	213	25.9	0.5	
V	51	2	He	0.110	11.2	4365	1.3	2.5	
Cr	52	2	He	-0.060	-142.7	3270	13.4	2.5	
Fe	56	2	He	2.891	12.4	26954	6.5	100	
Se	78	2	He	0.583	59.6	231	12.9	2	
As	75	2	He	-0.058	-49.7	253	8.6	2.5	
Ca	44	2	He	36.880	39.0	1854	27.8	100	
Na	23	2	He	35.981	9.1	135859	1.9	100	
Mg	24	2	He	18.367	5.0	9427	4.8	100	
K	39	2	He	-6.863	-14.5	115930	0.7	100	
Mn	55	2	He	0.164	41.3	2354	12.1	2.5	
Co	59	2	He	0.044	17.3	353	15.6	2.5	
Ni	60	2	He	0.101	31.4	260	21.4	2.5	
Cu	63	2	He	0.014	239.7	987	15.0	2	
Zn	66	2	He	0.166	32.4	413	12.4	2.5	
Al	27	2	He	0.695	36.5	1080	7.6	5	
B	11	1	No Gas	10.284	5.3	23855	3.3	0.5	CCB Main CR1 Failed
Al	27	1	No Gas	1.238	31.3	38096	8.9	5	
Si	28	1	No Gas	2.178	61.4	237556	2.2	10	
Ag	107	1	No Gas	0.080	12.5	1180	12.0	2.5	
Cd	111	1	No Gas	0.066	27.7	190	27.4	1	
Sr	88	1	No Gas	0.263	22.8	8103	20.1	2.5	
Mo	95	1	No Gas	0.136	14.5	727	14.8	2.5	
Sn	118	1	No Gas	0.085	19.4	1964	7.2	5	
Sb	121	1	No Gas	0.226	14.7	2870	11.6	2.5	
Ba	137	1	No Gas	0.056	45.1	450	25.6	2.5	
Tl	205	1	No Gas	0.143	30.0	3731	29.2	1	
Tl	203	1	No Gas	0.129	37.0	1410	35.4	1	
Pb	208	1	No Gas	0.104	21.0	4264	17.7	2.5	
U	238	1	No Gas	0.067	35.0	2457	34.5	2.5	
Ca	43	2	He	41.853	90.7	110	72.7	100	
Sb	121	2	He	0.157	10.6	1143	8.8	2.5	
Ti	47	2	He	0.091	206.7	30	120.2	2.5	
Cu	63	1	No Gas	0.038	44.7	2520	4.8	2.5	
Se	82	1	No Gas	1.715	18.6	224	22.6	2	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	732016	2.49	851397	85.98	70	120	
Ge	72	2	He	652992	0.34	694065	94.08	70	120	
Ge	72	1	No Gas	1980999	1.31	2139408	92.60	70	120	
In	115	1	No Gas	2589491	1.62	2719437	95.22	70	120	
Bi	209	1	No Gas	2488321	1.06	2536806	98.09	70	120	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	218_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:55:53-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Li	7	1	No Gas	101.671	2.798	859425	1.16	100	101.7	90	110	
Be	9	1	No Gas	101.940	0.531	214963	1.04	100	101.9	90	110	
V	51	2	He	97.082	0.326	428722	0.21	100	97.1	90	110	
Cr	52	2	He	97.332	0.478	479930	0.41	100	97.3	90	110	
Fe	56	2	He	9933.126	0.524	47022534	0.74	10000	99.3	90	110	
Se	78	2	He	100.369	0.767	8623	0.84	100	100.4	90	110	
As	75	2	He	99.717	1.024	75232	0.81	100	99.7	90	110	
Ca	44	2	He	9688.393	0.427	336918	0.23	10000	96.9	90	110	
Na	23	2	He	9624.459	1.905	7577383	1.72	10000	96.2	90	110	
Mg	24	2	He	9722.379	0.750	4556973	0.92	10000	97.2	90	110	
K	39	2	He	9582.369	1.701	6642528	1.59	10000	95.8	90	110	
Mn	55	2	He	99.969	0.736	403709	0.73	100	100.0	90	110	
Co	59	2	He	95.566	0.600	664332	0.45	100	95.6	90	110	
Ni	60	2	He	99.568	0.807	164572	0.87	100	99.6	90	110	
Cu	63	2	He	98.522	1.656	417618	1.56	100	98.5	90	110	
Zn	66	2	He	99.771	0.675	93759	0.52	100	99.8	90	110	
Al	27	2	He	102.956	1.763	32492	1.70	100	103.0	90	110	
B	11	1	No Gas	504.493	1.771	649276	0.23	500	100.9	90	110	
Al	27	1	No Gas	101.384	1.878	989430	1.84	100	101.4	90	110	
Si	28	1	No Gas	490.196	2.434	2576935	1.53	5000	9.8	90	110	CCV Main CR1-2 Failed
Ag	107	1	No Gas	101.904	1.139	1221375	2.04	100	101.9	90	110	
Cd	111	1	No Gas	100.917	0.353	251456	1.28	100	100.9	90	110	
Sr	88	1	No Gas	99.047	1.246	2388120	2.02	100	99.0	90	110	
Mo	95	1	No Gas	97.507	0.663	452602	0.36	100	97.5	90	110	
Sn	118	1	No Gas	100.443	0.828	777055	0.34	100	100.4	90	110	
Sb	121	1	No Gas	103.316	1.164	1078478	1.40	100	103.3	90	110	
Ba	137	1	No Gas	101.566	0.675	407525	0.33	100	101.6	90	110	
Tl	205	1	No Gas	102.404	3.261	2507481	2.06	100	102.4	90	110	
Tl	203	1	No Gas	99.955	1.064	1012742	0.73	100	100.0	90	110	
Pb	208	1	No Gas	100.724	1.897	3375736	1.01	100	100.7	90	110	
U	238	1	No Gas	104.370	2.144	3611383	0.53	100	104.4	90	110	
Ca	43	2	He	9908.077	2.823	19895	2.70	10000	99.1	90	110	
Sb	121	2	He	99.089	0.321	569866	0.43	100	99.1	90	110	
Ti	47	2	He	97.843	2.361	17929	2.54	100	97.8	90	110	
Cu	63	1	No Gas	97.195	0.700	781451	0.30	100	97.2	90	110	
Se	82	1	No Gas	97.587	2.985	14488	2.73	100	97.6	90	110	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	662366	1.53	851397	77.80	70	120	
Ge	72	2	He	623879	0.22	694065	89.89	70	120	
Ge	72	1	No Gas	1886208	0.95	2139408	88.16	70	120	
In	115	1	No Gas	2409926	1.00	2719437	88.62	70	120	
Bi	209	1	No Gas	2388708	1.74	2536806	94.16	70	120	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	219_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:57:48-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Li	7	1	No Gas	0.551	12.0	46180	1.2	0.5	CCB Main CR1 Failed
Be	9	1	No Gas	0.074	21.3	173	19.6	0.5	
V	51	2	He	0.339	11.5	5279	2.8	2.5	
Cr	52	2	He	-0.012	-631.3	3427	10.6	2.5	
Fe	56	2	He	2.285	9.5	23367	5.1	100	
Se	78	2	He	0.315	41.5	203	5.4	2	
As	75	2	He	0.007	1272.0	297	22.8	2.5	
Ca	44	2	He	26.097	12.6	1427	8.2	100	
Na	23	2	He	68.488	2.1	158266	0.6	100	
Mg	24	2	He	16.724	6.3	8409	6.6	100	
K	39	2	He	-5.544	-45.6	113971	1.2	100	
Mn	55	2	He	0.155	16.3	2257	5.3	2.5	
Co	59	2	He	0.036	19.4	283	16.7	2.5	
Ni	60	2	He	0.087	30.0	230	19.9	2.5	
Cu	63	2	He	0.026	48.3	1017	5.4	2	
Zn	66	2	He	0.086	42.9	327	10.8	2.5	
Al	27	2	He	0.206	112.9	900	8.8	5	
B	11	1	No Gas	14.015	3.0	27777	1.6	0.5	CCB Main CR1 Failed
Al	27	1	No Gas	0.476	27.5	30080	2.8	5	
Si	28	1	No Gas	0.168	320.3	224272	1.2	10	
Ag	107	1	No Gas	0.061	26.7	903	20.7	2.5	
Cd	111	1	No Gas	0.061	72.1	170	66.8	1	
Sr	88	1	No Gas	0.209	9.6	6498	8.0	2.5	
Mo	95	1	No Gas	0.101	32.5	537	29.6	2.5	
Sn	118	1	No Gas	0.088	48.5	1924	17.0	5	
Sb	121	1	No Gas	0.117	18.6	1653	13.0	2.5	
Ba	137	1	No Gas	0.079	31.1	533	19.0	2.5	
Tl	205	1	No Gas	0.116	33.2	2994	32.4	1	
Tl	203	1	No Gas	0.104	33.6	1130	32.2	1	
Pb	208	1	No Gas	0.084	29.6	3510	24.4	2.5	
U	238	1	No Gas	0.067	38.2	2420	37.8	2.5	
Ca	43	2	He	15.574	35.7	53	21.7	100	
Sb	121	2	He	0.073	21.0	627	14.8	2.5	
Ti	47	2	He	-0.012	-438.5	10	100.0	2.5	
Cu	63	1	No Gas	0.011	207.7	2264	7.2	2.5	
Se	82	1	No Gas	-0.314	-237.1	-91	-124.5	2	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	698853	0.56	851397	82.08	70	120	
Ge	72	2	He	636823	0.69	694065	91.75	70	120	
Ge	72	1	No Gas	1953659	1.47	2139408	91.32	70	120	
In	115	1	No Gas	2510704	2.41	2719437	92.32	70	120	
Bi	209	1	No Gas	2449070	0.39	2536806	96.54	70	120	

Sample Report

Sample Table

Sample Name	HS21120243-04
Data File Name	223SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T22:06:05-06:00
Sample Type	Sample
Dilution	1
Comment	DOD TW 173565
ISTD Ref FileName	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	88.380	88.380	1.31	754068	0.01	2000	
Be	9	1	No Gas	0.081	0.081	24.24	180	0.04	2000	
V	51	2	He	2.204	2.204	3.09	13722	0.02	2000	
Cr	52	2	He	15.499	15.499	1.22	81579	0.02	2000	
Fe	56	2	He	522.717	522.717	0.32	2557503	0.02	200000	
Se	78	2	He	0.474	0.474	44.43	218	0.22	2000	
As	75	2	He	0.406	0.406	10.60	608	0.07	2000	
Ca	44	2	He	98109.771	98109.771	0.73	3505441	2.80	200000	
Na	23	2	He	277975.402	277975.402	0.45	222236883	0.13	200000	>LDR
Mg	24	2	He	46983.540	46983.540	0.54	22653961	0.21	200000	
K	39	2	He	655.214	655.214	0.50	577922	0.11	200000	
Mn	55	2	He	282.069	282.069	2.62	1168955	0.02	2000	
Co	59	2	He	1.487	1.487	2.06	10664	0.01	2000	
Ni	60	2	He	61.225	61.225	0.58	104142	0.06	2000	
Cu	63	2	He	2.268	2.268	4.23	10778	0.02	2000	
Zn	66	2	He	7.628	7.628	1.08	7602	0.10	2000	
Al	27	2	He	168.570	168.570	1.85	54194	0.31	2000	
B	11	1	No Gas	33.155	33.155	1.79	50753	0.07	2000	
Al	27	1	No Gas	192.401	192.401	23.10	1893483	0.01	2000	
Si	28	1	No Gas	16603.527	16603.527	1.98	81803945	0.02	2000	>LDR
Ag	107	1	No Gas	0.018	0.018	15.38	363	0.00	2000	
Cd	111	1	No Gas	0.154	0.154	15.26	403	0.04	2000	
Sr	88	1	No Gas	2187.125	2187.125	1.63	53836923	0.00	2000	>LDR
Mo	95	1	No Gas	1.690	1.690	0.75	8059	0.02	2000	
Sn	118	1	No Gas	0.010	0.010	122.70	1280	0.00	2000	
Sb	121	1	No Gas	0.148	0.148	8.17	1960	0.01	2000	
Ba	137	1	No Gas	35.106	35.106	0.17	144012	0.02	2000	
Tl	205	1	No Gas	0.018	0.018	32.52	513	0.00	2000	
Tl	203	1	No Gas	0.016	0.016	42.90	203	0.01	2000	
Pb	208	1	No Gas	0.248	0.248	1.00	8585	0.00	2000	
U	238	1	No Gas	2.319	2.319	0.81	77048	0.00	2000	
Ca	43	2	He	99641.425	99641.425	0.94	205644	48.45	200000	
Sb	121	2	He	0.150	0.150	14.49	1087	0.01	2000	
Ti	47	2	He	4.449	4.449	33.79	850	0.52	2000	
Cu	63	1	No Gas	3.613	3.613	5.76	31681	0.01	2000	
Zn	66	1	No Gas	8.366	8.366	3.99	19661	0.04	2000	
Se	82	1	No Gas	3.302	3.302	11.46	458	0.72	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	663878	1.17	851397	77.98	70	120	
Ge	72	2	He	641845	0.16	694065	92.48	70	120	
Ge	72	1	No Gas	1924363	2.01	2139408	89.95	70	120	
In	115	1	No Gas	2461487	0.63	2719437	90.51	70	120	
Bi	209	1	No Gas	2292500	0.89	2536806	90.37	70	120	

Sample Report

Sample Table

Sample Name	HS21120243-05
Data File Name	224SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T22:08:08-06:00
Sample Type	Sample
Dilution	1
Comment	DOD TW 173565
ISTD Ref FileName	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	98.359	98.359	2.27	838174	0.01	2000	
Be	9	1	No Gas	0.088	0.088	8.62	197	0.04	2000	
V	51	2	He	2.302	2.302	1.64	14085	0.02	2000	
Cr	52	2	He	20.478	20.478	1.36	106065	0.02	2000	
Fe	56	2	He	697.955	697.955	1.09	3391710	0.02	200000	
Se	78	2	He	0.526	0.526	8.03	221	0.24	2000	
As	75	2	He	0.530	0.530	2.46	700	0.08	2000	
Ca	44	2	He	108167.324	108167.324	1.37	3843160	2.81	200000	
Na	23	2	He	301816.099	301816.099	1.61	239946850	0.13	200000	>LDR
Mg	24	2	He	50911.132	50911.132	0.90	24411606	0.21	200000	
K	39	2	He	721.662	721.662	2.08	621006	0.12	200000	
Mn	55	2	He	303.761	303.761	2.54	1251725	0.02	2000	
Co	59	2	He	1.609	1.609	3.15	11475	0.01	2000	
Ni	60	2	He	66.393	66.393	1.00	112296	0.06	2000	
Cu	63	2	He	2.197	2.197	1.63	10411	0.02	2000	
Zn	66	2	He	6.395	6.395	0.72	6378	0.10	2000	
Al	27	2	He	272.068	272.068	3.51	86459	0.31	2000	
B	11	1	No Gas	33.877	33.877	0.67	51884	0.07	2000	
Al	27	1	No Gas	266.549	266.549	7.14	2591279	0.01	2000	
Si	28	1	No Gas	18448.385	18448.385	1.67	90136665	0.02	2000	>LDR
Ag	107	1	No Gas	0.013	0.013	35.45	307	0.00	2000	
Cd	111	1	No Gas	0.196	0.196	9.51	507	0.04	2000	
Sr	88	1	No Gas	2413.148	2413.148	0.61	58994107	0.00	2000	>LDR
Mo	95	1	No Gas	1.994	1.994	2.74	9430	0.02	2000	
Sn	118	1	No Gas	0.025	0.025	58.76	1383	0.00	2000	
Sb	121	1	No Gas	0.132	0.132	4.09	1777	0.01	2000	
Ba	137	1	No Gas	38.535	38.535	1.68	157000	0.02	2000	
Tl	205	1	No Gas	0.024	0.024	19.09	627	0.00	2000	
Tl	203	1	No Gas	0.015	0.015	19.75	193	0.01	2000	
Pb	208	1	No Gas	0.261	0.261	0.86	8871	0.00	2000	
U	238	1	No Gas	2.529	2.529	3.77	82981	0.00	2000	
Ca	43	2	He	107729.226	107729.226	0.31	221102	48.72	200000	
Sb	121	2	He	0.132	0.132	3.01	970	0.01	2000	
Ti	47	2	He	6.339	6.339	7.72	1200	0.53	2000	
Cu	63	1	No Gas	3.694	3.694	1.49	32095	0.01	2000	
Zn	66	1	No Gas	7.868	7.868	17.04	18355	0.04	2000	
Se	82	1	No Gas	4.080	4.080	18.21	572	0.71	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	666516	0.59	851397	78.28	70	120	
Ge	72	2	He	638303	0.81	694065	91.97	70	120	
Ge	72	1	No Gas	1908612	1.20	2139408	89.21	70	120	
In	115	1	No Gas	2444781	0.99	2719437	89.90	70	120	
Bi	209	1	No Gas	2264614	1.82	2536806	89.27	70	120	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	227_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T22:14:07-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Li	7	1	No Gas	99.943	7.852	907961	4.34	100	99.9	90	110	
Be	9	1	No Gas	101.198	4.004	229291	0.67	100	101.2	90	110	
V	51	2	He	97.463	0.946	444304	0.14	100	97.5	90	110	
Cr	52	2	He	97.316	0.503	495395	0.97	100	97.3	90	110	
Fe	56	2	He	9839.132	1.905	48080839	1.17	10000	98.4	90	110	
Se	78	2	He	100.849	3.769	8943	3.47	100	100.8	90	110	
As	75	2	He	99.839	1.056	77759	0.43	100	99.8	90	110	
Ca	44	2	He	9635.350	0.918	345911	0.22	10000	96.4	90	110	
Na	23	2	He	9592.038	1.576	7796278	0.81	10000	95.9	90	110	
Mg	24	2	He	9657.848	1.130	4672993	0.40	10000	96.6	90	110	
K	39	2	He	9760.821	1.158	6982956	1.00	10000	97.6	90	110	
Mn	55	2	He	99.003	1.456	412740	0.63	100	99.0	90	110	
Co	59	2	He	94.921	2.133	681145	1.30	100	94.9	90	110	
Ni	60	2	He	98.482	1.490	168041	1.26	100	98.5	90	110	
Cu	63	2	He	98.334	1.602	430286	0.81	100	98.3	90	110	
Zn	66	2	He	98.053	2.589	95122	1.87	100	98.1	90	110	
Al	27	2	He	101.634	2.314	33120	1.43	100	101.6	90	110	
B	11	1	No Gas	487.207	2.926	674294	0.54	500	97.4	90	110	
Al	27	1	No Gas	103.309	3.183	1024702	1.89	100	103.3	90	110	
Si	28	1	No Gas	513.809	1.227	2736749	1.20	5000	10.3	90	110	CCV Main CR1-2 Failed
Ag	107	1	No Gas	99.199	1.523	1233065	0.03	100	99.2	90	110	
Cd	111	1	No Gas	98.921	0.072	255679	1.62	100	98.9	90	110	
Sr	88	1	No Gas	99.784	1.427	2495680	2.48	100	99.8	90	110	
Mo	95	1	No Gas	96.124	1.373	462790	0.26	100	96.1	90	110	
Sn	118	1	No Gas	98.718	0.913	792205	0.69	100	98.7	90	110	
Sb	121	1	No Gas	101.800	1.885	1080719	1.78	100	101.8	90	110	
Ba	137	1	No Gas	100.212	0.758	417094	0.87	100	100.2	90	110	
Tl	205	1	No Gas	101.951	1.198	2487454	1.39	100	102.0	90	110	
Tl	203	1	No Gas	99.870	0.884	1008057	1.09	100	99.9	90	110	
Pb	208	1	No Gas	99.239	0.522	3313581	0.40	100	99.2	90	110	
U	238	1	No Gas	103.242	0.808	3559192	0.63	100	103.2	90	110	
Ca	43	2	He	10073.449	2.360	20879	1.71	10000	100.7	90	110	
Sb	121	2	He	97.591	0.937	579397	0.42	100	97.6	90	110	
Ti	47	2	He	96.266	2.747	18209	2.32	100	96.3	90	110	
Cu	63	1	No Gas	98.664	1.729	806689	0.70	100	98.7	90	110	
Se	82	1	No Gas	98.834	0.681	14925	0.83	100	98.8	90	110	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	712301	3.41	851397	83.66	70	120	
Ge	72	2	He	644081	0.84	694065	92.80	70	120	
Ge	72	1	No Gas	1918364	1.21	2139408	89.67	70	120	
In	115	1	No Gas	2499871	1.55	2719437	91.93	70	120	
Bi	209	1	No Gas	2379366	0.27	2536806	93.79	70	120	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	228_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T22:16:01-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Li	7	1	No Gas	0.652	11.7	48854	1.4	0.5	CCB Main CR1 Failed
Be	9	1	No Gas	0.054	53.5	133	48.9	0.5	
V	51	2	He	0.309	19.8	5213	4.8	2.5	
Cr	52	2	He	-0.043	-85.6	3320	4.5	2.5	
Fe	56	2	He	2.134	15.0	22930	6.1	100	
Se	78	2	He	0.696	34.1	239	9.2	2	
As	75	2	He	0.040	155.1	327	14.4	2.5	
Ca	44	2	He	10.166	12.9	873	4.3	100	
Na	23	2	He	87.085	4.8	175337	1.1	100	
Mg	24	2	He	9.469	3.1	5004	3.6	100	
K	39	2	He	-0.514	-288.0	119060	0.8	100	
Mn	55	2	He	0.008	366.1	1677	8.1	2.5	
Co	59	2	He	0.022	14.1	187	12.4	2.5	
Ni	60	2	He	0.027	65.8	130	23.1	2.5	
Cu	63	2	He	0.032	68.6	1057	10.1	2	
Zn	66	2	He	0.037	217.2	283	26.5	2.5	
Al	27	2	He	-0.238	-90.8	770	7.9	5	
B	11	1	No Gas	10.810	6.9	24381	3.3	0.5	CCB Main CR1 Failed
Al	27	1	No Gas	-0.150	-129.8	24058	7.4	5	
Si	28	1	No Gas	1.518	12.5	232457	1.0	10	
Ag	107	1	No Gas	0.044	21.3	703	17.2	2.5	
Cd	111	1	No Gas	0.046	47.9	133	43.9	1	
Sr	88	1	No Gas	0.136	15.4	4701	11.6	2.5	
Mo	95	1	No Gas	0.101	24.4	540	22.8	2.5	
Sn	118	1	No Gas	0.081	49.3	1900	17.4	5	
Sb	121	1	No Gas	0.091	23.9	1387	17.3	2.5	
Ba	137	1	No Gas	0.044	65.7	390	31.5	2.5	
Tl	205	1	No Gas	0.092	32.8	2304	30.2	1	
Tl	203	1	No Gas	0.092	43.4	967	39.5	1	
Pb	208	1	No Gas	0.079	32.0	3227	24.6	2.5	
U	238	1	No Gas	0.059	36.5	2047	34.4	2.5	
Ca	43	2	He	4.010	242.7	30	66.7	100	
Sb	121	2	He	0.066	22.4	590	13.9	2.5	
Ti	47	2	He	0.005	1626.0	13	114.6	2.5	
Cu	63	1	No Gas	0.022	151.8	2370	12.1	2.5	
Se	82	1	No Gas	0.017	2238.7	-41	-142.1	2	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	725782	1.07	851397	85.25	70	120	
Ge	72	2	He	645451	1.10	694065	93.00	70	120	
Ge	72	1	No Gas	1965749	0.59	2139408	91.88	70	120	
In	115	1	No Gas	2541301	0.55	2719437	93.45	70	120	
Bi	209	1	No Gas	2354112	1.67	2536806	92.80	70	120	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	284_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-16T00:08:03-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Li	7	1	No Gas	99.998	4.606	880636	3.04	100	100.0	90	110	
Be	9	1	No Gas	100.310	1.132	220222	0.34	100	100.3	90	110	
V	51	2	He	96.630	0.900	440498	0.74	100	96.6	90	110	
Cr	52	2	He	96.967	0.360	493590	1.40	100	97.0	90	110	
Fe	56	2	He	9779.929	0.966	47792754	1.67	10000	97.8	90	110	
Se	78	2	He	97.050	1.184	8612	0.84	100	97.0	90	110	
As	75	2	He	99.288	0.403	77327	0.81	100	99.3	90	110	
Ca	44	2	He	9702.064	0.606	348283	1.12	10000	97.0	90	110	
Na	23	2	He	9494.949	1.812	7717300	0.65	10000	94.9	90	110	
Mg	24	2	He	9699.648	1.248	4692697	0.70	10000	97.0	90	110	
K	39	2	He	9680.644	1.554	6925832	1.49	10000	96.8	90	110	
Mn	55	2	He	98.422	0.704	410320	1.28	100	98.4	90	110	
Co	59	2	He	95.265	0.714	683595	0.47	100	95.3	90	110	
Ni	60	2	He	97.486	1.067	166322	0.41	100	97.5	90	110	
Cu	63	2	He	98.664	1.424	431686	0.65	100	98.7	90	110	
Zn	66	2	He	99.295	0.743	96324	0.98	100	99.3	90	110	
Al	27	2	He	98.450	5.202	32097	3.93	100	98.4	90	110	
B	11	1	No Gas	501.253	1.504	671750	0.49	500	100.3	90	110	
Al	27	1	No Gas	98.245	2.927	972036	1.10	100	98.2	90	110	
Si	28	1	No Gas	509.573	2.177	2705506	0.36	5000	10.2	90	110	CCV Main CR1-2 Failed
Ag	107	1	No Gas	100.653	0.473	1236963	1.52	100	100.7	90	110	
Cd	111	1	No Gas	100.037	1.460	255564	0.91	100	100.0	90	110	
Sr	88	1	No Gas	100.646	0.637	2488051	0.96	100	100.6	90	110	
Mo	95	1	No Gas	98.580	1.563	469161	0.30	100	98.6	90	110	
Sn	118	1	No Gas	100.245	1.698	795152	0.48	100	100.2	90	110	
Sb	121	1	No Gas	100.911	1.649	1067233	0.93	100	100.9	90	110	
Ba	137	1	No Gas	101.658	1.545	418216	0.09	100	101.7	90	110	
Tl	205	1	No Gas	102.296	1.349	2496133	0.63	100	102.3	90	110	
Tl	203	1	No Gas	100.492	1.538	1014432	0.81	100	100.5	90	110	
Pb	208	1	No Gas	99.274	1.835	3315094	1.15	100	99.3	90	110	
U	238	1	No Gas	101.768	0.454	3508978	0.29	100	101.8	90	110	
Ca	43	2	He	9771.047	3.317	20249	2.18	10000	97.7	90	110	
Sb	121	2	He	97.239	0.780	577253	0.42	100	97.2	90	110	
Ti	47	2	He	98.314	0.134	18596	1.17	100	98.3	90	110	
Cu	63	1	No Gas	98.675	1.430	803794	0.68	100	98.7	90	110	
Se	82	1	No Gas	98.937	1.295	14887	2.82	100	98.9	90	110	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	689633	1.42	851397	81.00	70	120	
Ge	72	2	He	644021	1.14	694065	92.79	70	120	
Ge	72	1	No Gas	1911351	1.90	2139408	89.34	70	120	
In	115	1	No Gas	2471189	1.54	2719437	90.87	70	120	
Bi	209	1	No Gas	2379801	0.73	2536806	93.81	70	120	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	285_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-16T00:09:58-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Li	7	1	No Gas	0.351	13.7	45752	1.5	0.5	
Be	9	1	No Gas	0.072	46.0	175	42.7	0.5	
V	51	2	He	-0.076	-13.8	3502	1.3	2.5	
Cr	52	2	He	-0.036	-110.0	3384	6.4	2.5	
Fe	56	2	He	2.761	7.4	26219	3.4	100	
Se	78	2	He	0.463	73.4	220	13.2	2	
As	75	2	He	-0.072	-38.8	241	9.4	2.5	
Ca	44	2	He	-2.464	-79.3	423	16.6	100	
Na	23	2	He	1.164	115.8	107179	0.6	100	
Mg	24	2	He	2.813	17.0	1790	12.6	100	
K	39	2	He	-6.541	-14.2	115756	0.3	100	
Mn	55	2	He	-0.071	-15.0	1357	3.7	2.5	
Co	59	2	He	0.024	14.2	203	12.4	2.5	
Ni	60	2	He	0.054	6.9	177	3.3	2.5	
Cu	63	2	He	-0.005	-149.1	900	4.0	2	
Zn	66	2	He	0.245	33.1	490	16.2	2.5	
Al	27	2	He	-0.778	-45.1	603	18.3	5	
B	11	1	No Gas	11.509	6.8	25109	3.1	0.5	CCB Main CR1 Failed
Al	27	1	No Gas	-0.751	-8.7	17915	1.9	5	
Si	28	1	No Gas	0.273	185.0	223884	1.3	10	
Ag	107	1	No Gas	0.056	11.8	843	8.7	2.5	
Cd	111	1	No Gas	0.066	34.9	183	32.0	1	
Sr	88	1	No Gas	0.053	40.8	2560	20.3	2.5	
Mo	95	1	No Gas	0.092	46.3	490	41.3	2.5	
Sn	118	1	No Gas	0.154	19.0	2460	9.2	5	
Sb	121	1	No Gas	0.086	29.3	1310	19.6	2.5	
Ba	137	1	No Gas	0.047	46.2	400	22.2	2.5	
Tl	205	1	No Gas	0.118	32.8	3027	32.7	1	
Tl	203	1	No Gas	0.121	40.2	1307	39.6	1	
Pb	208	1	No Gas	0.088	18.4	3637	15.2	2.5	
U	238	1	No Gas	0.060	29.7	2144	29.9	2.5	
Ca	43	2	He	2.288	637.2	27	114.6	100	
Sb	121	2	He	0.053	14.7	520	8.8	2.5	
Ti	47	2	He	0.074	162.8	27	86.6	2.5	
Cu	63	1	No Gas	0.056	53.2	2624	8.6	2.5	
Se	82	1	No Gas	0.064	688.5	-35	-200.3	2	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	718822	1.19	851397	84.43	70	120	
Ge	72	2	He	650733	0.43	694065	93.76	70	120	
Ge	72	1	No Gas	1945753	1.77	2139408	90.95	70	120	
In	115	1	No Gas	2512925	1.08	2719437	92.41	70	120	
Bi	209	1	No Gas	2439477	2.02	2536806	96.16	70	120	

Sample Report

Sample Table

Sample Name	LLCCV2
Data File Name	286LCV2.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-16T00:11:56-06:00
Sample Type	LLCCV2
Dilution	1
Comment	
ISTD Ref FileName	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	2.141	2.141	2.30	61622	0.00	2	
Be	9	1	No Gas	1.865	1.865	2.75	4291	0.04	2	
V	51	2	He	1.744	1.744	2.26	11830	0.01	2	
Cr	52	2	He	1.711	1.711	5.23	12322	0.01	2	
Fe	56	2	He	196.129	196.129	1.30	982321	0.02	200	
Se	78	2	He	2.201	2.201	11.78	373	0.59	2	
As	75	2	He	1.679	1.679	20.54	1617	0.10	2	
Ca	44	2	He	186.959	186.959	5.91	7295	2.56	200	
Na	23	2	He	190.527	190.527	0.52	261016	0.07	200	
Mg	24	2	He	196.939	196.939	2.24	96838	0.20	200	
K	39	2	He	182.870	182.870	3.35	250725	0.07	200	
Mn	55	2	He	1.743	1.743	6.59	8983	0.02	2	
Co	59	2	He	1.868	1.868	0.91	13600	0.01	2	
Ni	60	2	He	1.850	1.850	3.16	3277	0.06	2	
Cu	63	2	He	1.924	1.924	4.86	9427	0.02	2	
Zn	66	2	He	1.780	1.780	12.89	1994	0.09	2	
Al	27	2	He	2.134	2.134	26.04	1540	0.14	2	
B	11	1	No Gas	18.038	18.038	2.02	34223	0.05	10	NewName Main CR1 Failed
Al	27	1	No Gas	2.056	2.056	4.39	45561	0.00	2	
Si	28	1	No Gas	8.950	8.950	8.75	267514	0.00	10	
Ag	107	1	No Gas	1.855	1.855	4.19	23972	0.01	2	
Cd	111	1	No Gas	1.832	1.832	3.82	4904	0.04	2	
Sr	88	1	No Gas	1.869	1.869	2.77	49548	0.00	2	
Mo	95	1	No Gas	1.892	1.892	4.61	9457	0.02	2	
Sn	118	1	No Gas	1.897	1.897	2.65	16961	0.01	2	
Sb	121	1	No Gas	1.970	1.970	0.92	21641	0.01	2	
Ba	137	1	No Gas	1.923	1.923	2.15	8480	0.02	2	
Tl	205	1	No Gas	1.906	1.906	1.00	47882	0.00	2	
Tl	203	1	No Gas	1.948	1.948	1.29	20260	0.01	2	
Pb	208	1	No Gas	1.894	1.894	2.82	65594	0.00	2	
U	238	1	No Gas	1.823	1.823	1.46	64611	0.00	2	
Ca	43	2	He	197.888	197.888	13.05	437	45.32	200	
Sb	121	2	He	1.868	1.868	1.15	11422	0.02	2	
Ti	47	2	He	1.852	1.852	11.72	367	0.51	200	
Cu	63	1	No Gas	1.935	1.935	3.45	18202	0.01	2	
Se	82	1	No Gas	1.486	1.486	25.94	185	0.80	2	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	721079	0.66	851397	84.69	70	120	
Ge	72	2	He	651779	0.32	694065	93.91	70	120	
Ge	72	1	No Gas	1949636	1.66	2139408	91.13	70	120	
In	115	1	No Gas	2583779	1.97	2719437	95.01	70	120	
Bi	209	1	No Gas	2445078	0.77	2536806	96.38	70	120	

Sample Report

Sample Table

Sample Name	LLCCV5
Data File Name	287LCV5.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-16T00:13:54-06:00
Sample Type	LLCCV5
Dilution	1
Comment	
ISTD Ref FileName	155CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	5.003	5.003	3.21	85710	0.01	5	
Be	9	1	No Gas	4.662	4.662	0.69	10582	0.04	5	
V	51	2	He	4.604	4.604	2.05	24629	0.02	5	
Cr	52	2	He	4.566	4.566	3.66	26623	0.02	5	
Fe	56	2	He	497.568	497.568	1.03	2444794	0.02	500	
Se	78	2	He	5.347	5.347	2.49	643	0.83	5	
As	75	2	He	4.676	4.676	1.31	3925	0.12	5	
Ca	44	2	He	477.641	477.641	3.83	17642	2.71	500	
Na	23	2	He	480.497	480.497	1.30	490704	0.10	500	
Mg	24	2	He	500.061	500.061	0.90	242484	0.21	500	
K	39	2	He	479.382	479.382	1.69	456512	0.11	500	
Mn	55	2	He	4.563	4.563	1.30	20602	0.02	5	
Co	59	2	He	4.654	4.654	2.30	33441	0.01	5	
Ni	60	2	He	4.897	4.897	3.72	8439	0.06	5	
Cu	63	2	He	4.864	4.864	0.76	22165	0.02	5	
Zn	66	2	He	4.921	4.921	4.78	5011	0.10	5	
Al	27	2	He	5.304	5.304	3.31	2530	0.21	5	
B	11	1	No Gas	31.098	31.098	2.36	51651	0.06	25	
Al	27	1	No Gas	5.309	5.309	2.33	76929	0.01	5	
Si	28	1	No Gas	24.122	24.122	3.63	340213	0.01	25	
Ag	107	1	No Gas	4.842	4.842	1.06	60957	0.01	5	
Cd	111	1	No Gas	4.907	4.907	1.21	12826	0.04	5	
Sr	88	1	No Gas	4.761	4.761	0.76	121487	0.00	5	
Mo	95	1	No Gas	4.941	4.941	2.37	24079	0.02	5	
Sn	118	1	No Gas	4.928	4.928	2.16	41128	0.01	5	
Sb	121	1	No Gas	4.991	4.991	1.09	53770	0.01	5	
Ba	137	1	No Gas	5.206	5.206	2.81	22082	0.02	5	
Tl	205	1	No Gas	4.800	4.800	2.35	119501	0.00	5	
Tl	203	1	No Gas	4.837	4.837	2.47	49840	0.01	5	
Pb	208	1	No Gas	4.774	4.774	2.88	163151	0.00	5	
U	238	1	No Gas	4.639	4.639	2.63	163103	0.00	5	
Ca	43	2	He	489.971	489.971	2.80	1037	47.26	500	
Sb	121	2	He	4.756	4.756	1.28	28441	0.02	5	
Ti	47	2	He	4.358	4.358	13.66	837	0.52	5	
Cu	63	1	No Gas	4.816	4.816	0.96	41734	0.01	5	
Se	82	1	No Gas	4.454	4.454	14.00	636	0.70	5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	712373	0.65	851397	83.67	70	120	
Ge	72	2	He	644443	0.95	694065	92.85	70	120	
Ge	72	1	No Gas	1933433	1.28	2139408	90.37	70	120	

Sample Report

In	115	1	No Gas	2525595	1.04	2719437	92.87	70	120	
Bi	209	1	No Gas	2427459	2.89	2536806	95.69	70	120	

Interference Check Solution A (ICS-A) Report

Sample Table

Sample Name	ICSA
Data File Name	288ICSA.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-16T00:15:53-06:00
Sample Type	ICSA
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Li	7	1	No Gas	0.800	2.7	45448	0.2	0	ICSA Main CR1 Failed
Be	9	1	No Gas	0.007	87.6	23	53.9	0	ICSA Main CR1 Failed
V	51	2	He	0.031	20.5	3776	0.4	0	ICSA Main CR1 Failed
Cr	52	2	He	2.951	1.0	17648	0.6	0	ICSA Main CR1 Failed
Fe	56	2	He	95679.657	0.8	447299433	0.5	0	
Se	78	2	He	0.658	38.4	225	9.4	0	ICSA Main CR1 Failed
As	75	2	He	0.023	98.9	299	5.2	0	ICSA Main CR1 Failed
Ca	44	2	He	97552.760	1.5	3346805	1.9	0	
Na	23	2	He	95279.585	0.9	73204062	0.7	0	
Mg	24	2	He	94340.681	1.6	43673321	1.3	0	
K	39	2	He	96674.978	1.2	65160164	0.8	0	
Mn	55	2	He	0.874	3.2	5041	2.6	0	ICSA Main CR1 Failed
Co	59	2	He	0.188	6.9	1323	7.0	0	ICSA Main CR1 Failed
Ni	60	2	He	1.375	8.0	2324	7.7	0	ICSA Main CR1 Failed
Cu	63	2	He	0.354	0.5	2354	0.6	0	ICSA Main CR1 Failed
Zn	66	2	He	1.847	4.4	1947	3.6	0	ICSA Main CR1 Failed
Al	27	2	He	97210.822	1.8	29541261	1.6	0	
B	11	1	No Gas	9.218	4.6	20088	2.5	0	
Al	27	1	No Gas	92103.136	1.4	862219854	0.6	0	
Si	28	1	No Gas	18.722	6.2	300883	0.8	0	ICSA Main CR1 Failed
Ag	107	1	No Gas	0.284	10.4	3481	10.0	0	ICSA Main CR1 Failed
Cd	111	1	No Gas	1.976	0.6	4844	0.6	0	ICSA Main CR1 Failed
Sr	88	1	No Gas	1.186	2.2	29216	1.5	0	ICSA Main CR1 Failed
Mo	95	1	No Gas	1986.453	0.4	9050905	1.1	0	
Sn	118	1	No Gas	0.243	15.0	2994	9.5	0	ICSA Main CR1 Failed
Sb	121	1	No Gas	0.069	3.9	1077	1.9	0	ICSA Main CR1 Failed
Ba	137	1	No Gas	0.446	9.5	1947	8.8	0	ICSA Main CR1 Failed
Tl	205	1	No Gas	0.022	30.4	577	25.2	0	ICSA Main CR1 Failed
Tl	203	1	No Gas	0.020	35.7	233	27.6	0	ICSA Main CR1 Failed
Pb	208	1	No Gas	0.106	8.4	3880	6.4	0	ICSA Main CR1 Failed
U	238	1	No Gas	0.008	42.4	303	36.3	0	ICSA Main CR1 Failed
Ca	43	2	He	95480.416	0.2	189202	0.3	0	
Sb	121	2	He	0.054	32.4	497	20.4	0	ICSA Main CR1 Failed
Ti	47	2	He	1967.745	0.7	355927	0.3	0	
Se	82	1	No Gas	-0.230	-455.2	-75	-203.7	0	ICSA Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	657572	0.19	851397	77.23	70	120	
Ge	72	2	He	616268	0.42	694065	88.79	70	120	
Ge	72	1	No Gas	1855428	1.49	2139408	86.73	70	120	
In	115	1	No Gas	2365658	0.71	2719437	86.99	70	120	
Bi	209	1	No Gas	2215313	1.33	2536806	87.33	70	120	

Interference Check Solution AB (ICS-AB) Report

Sample Table

Sample Name	ICSAB
Data File Name	289ICSB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-16T00:17:54-06:00
Sample Type	ICSB
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Li	7	1	No Gas	97.554	0.342	804674	0.53	100	97.6	180	120	ICSB Main CR1 Failed
Be	9	1	No Gas	98.773	1.297	202804	0.83	100	98.8	80	120	
V	51	2	He	95.375	1.621	422918	0.55	100	95.4	80	120	
Cr	52	2	He	95.369	1.437	472189	0.15	100	95.4	80	120	
Fe	56	2	He	105307.020	1.868	500366686	1.08	100	105307.0	80	120	
Se	78	2	He	98.388	0.761	8490	0.65	100	98.4	80	120	
As	75	2	He	97.921	0.684	74181	0.65	100	97.9	80	120	
Ca	44	2	He	103722.677	2.114	3616484	1.40	100	103722.7	80	120	ICSB Main CR1 Failed
Na	23	2	He	101497.940	0.999	79258515	1.12	100	101497.9	80	120	ICSB Main CR1 Failed
Mg	24	2	He	102596.446	1.269	48276138	0.74	100	102596.4	80	120	
K	39	2	He	103317.083	1.553	70771212	0.68	100	103317.1	80	120	ICSB Main CR1 Failed
Mn	55	2	He	96.532	2.166	391415	1.14	100	96.5	80	120	
Co	59	2	He	91.493	1.643	638541	0.34	100	91.5	80	120	
Ni	60	2	He	93.831	2.847	155692	1.67	100	93.8	80	120	
Cu	63	2	He	93.364	0.549	397404	0.77	100	93.4	80	120	
Zn	66	2	He	96.773	0.511	91319	0.96	100	96.8	80	120	
Al	27	2	He	94134.867	2.238	29073730	1.02	100	94134.9	80	120	ICSB Main CR1 Failed
B	11	1	No Gas	494.277	0.497	619664	0.91	100	494.3	80	120	
Al	27	1	No Gas	91463.543	1.802	865179614	0.61	100	91463.5	80	120	ICSB Main CR1 Failed
Si	28	1	No Gas	493.969	2.419	2579757	2.42	100	494.0	80	120	
Ag	107	1	No Gas	96.239	4.137	1134477	2.07	100	96.2	80	120	
Cd	111	1	No Gas	101.273	2.603	248247	0.79	100	101.3	80	120	
Sr	88	1	No Gas	102.555	2.479	2432477	0.69	100	102.6	80	120	
Mo	95	1	No Gas	2106.612	3.292	9618163	0.96	100	2106.6	80	120	ICSB Main CR1 Failed
Sn	118	1	No Gas	101.410	1.879	771954	1.18	100	101.4	80	120	
Sb	121	1	No Gas	101.155	1.770	1049423	0.14	100	101.2	80	120	
Ba	137	1	No Gas	101.928	3.672	402279	0.64	100	101.9	80	120	
Tl	205	1	No Gas	100.109	0.576	2301759	1.26	100	100.1	80	120	
Tl	203	1	No Gas	98.642	1.078	938217	0.15	100	98.6	80	120	
Pb	208	1	No Gas	99.389	0.401	3127407	1.14	100	99.4	80	120	
U	238	1	No Gas	104.168	1.711	3383819	0.62	100	104.2	80	120	
Ca	43	2	He	104412.980	1.484	210290	0.62	100	104413.0	80	120	
Sb	121	2	He	96.828	1.391	559076	0.07	100	96.8	80	120	
Ti	47	2	He	2041.599	1.630	375333	0.55	100	2041.6	80	120	ICSB Main CR1 Failed
Cu	63	1	No Gas	93.597	1.840	747989	0.26	100	93.6	80	120	
Se	82	1	No Gas	101.411	2.955	14964	1.81	100	101.4	80	120	

QC ISTD Table

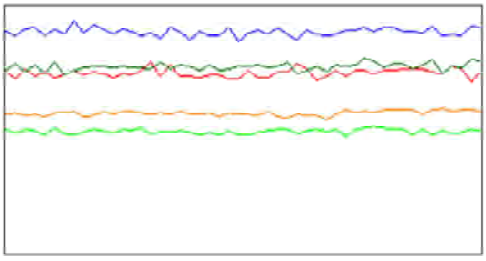
Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	644933	0.77	851397	75.75	70	120	
Ge	72	2	He	626433	1.32	694065	90.26	70	120	
Ge	72	1	No Gas	1874992	1.91	2139408	87.64	70	120	
In	115	1	No Gas	2372058	2.98	2719437	87.23	70	120	
Bi	209	1	No Gas	2242274	1.08	2536806	88.39	70	120	

Tune Check Report

Operator Name	ALSHS NoUser
Acq/Data Batch	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq. Date-Time	12/15/2021 10:23:58 AM
Report Comment	---
Instrument Name	G8421A SG18523544

[No Gas]

Sensitivity



Sampling Period [sec]	0.514
Integration Time [sec]	0.1

Mass	Range	Count	Resp [cps/ug/l]	Resp (Required) [cps/ug/l]	Resp (Flag)
9	5000	3652	36517.75		
24	20000	9894	98936.56		
59	20000	17942	179415.69		
115	50000	28460	284603.17		
208	20000	15113	151127.70		

Mass	Resp Ratio	Resp Ratio (Required)	Resp Ratio (Flag)
9		-	
24		-	
59		-	
115		-	
208		-	

Mass	RSD%	RSD% (Required)	RSD% (Flag)
9	2.319	5.000	
24	1.883	5.000	
59	1.920	5.000	
115	1.690	5.000	
208	2.020	5.000	

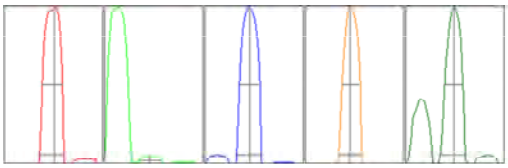
Mass	Background	Background (Required)	Background (Flag)
9	0.600		
24	0.500		
59	0.600		
115	0.500		
208	0.800		

Oxide/Doubly Charged Ratio

Oxide	156 / 140 1.168 %
Doubly Charged	70 / 140 0.957 %

Tune Check Report

Resolution/Axis



Integration Time [sec]	0.1
Acquisition Time [sec]	37.4
Y Axis	Linear

Mass	Peak Height	Axis	Axis (Required)	Axis (Flag)
9	3722.52	9.05	8.90 - 9.10	
24	10091.31	23.90	23.90 - 24.10	
59	18554.56	58.90	58.90 - 59.10	
115	29341.61	114.90	114.90 - 115.10	
208	15101.13	208.00	207.90 - 208.10	

Mass	W-50%	W-5%	W-5% (Required)	W-5% (Flag)
9	0.62	0.739		
24	0.67	0.742		
59	0.61	0.740		
115	0.55	0.692		
208	0.57	0.759		

Tune Parameters

Plasma Parameters

Plasma Mode	---	Nebulizer Gas	0.48 L/min	Dilution Gas	0.55 L/min
RF Power	1600 W	Option Gas	---	Auxiliary Gas	0.90 L/min
RF Matching	1.80 V	Nebulizer Pump	0.10 rps	Plasma Gas	15.0 L/min
Sample Depth	8.0 mm	S/C Temp	2 °C		

Lens Parameters

Extract 1	0.0 V	Omega Lens	10.0 V	Deflect	14.0 V
Extract 2	-195.0 V	Cell Entrance	-30 V	Plate Bias	-45 V
Omega Bias	-90 V	Cell Exit	-50 V		

Cell Parameters

Use Gas	No	3rd Gas Flow	---	Energy Discrimination	5.0 V
He Flow	0.0 mL/min	OctP Bias	-8.0 V		
H2 Flow	---	OctP RF	200 V		

QP Parameters

Mass Gain	133	Axis Gain	1.0005	QP Bias	-3.0 V
Mass Offset	125	Axis Offset	0.04		

Hardware Settings

Torch

Torch H	0.9 mm	Torch V	-0.5 mm

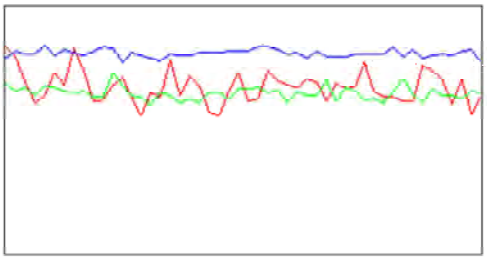
EM

Discriminator	4.4 mV	Analog HV	2601 V	Pulse HV	1377 V

[He]

Tune Check Report

Sensitivity



Sampling Period [sec]	0.306
Integration Time [sec]	0.1

Mass	Range	Count	Resp [cps/ug/l]	Resp (Required) [cps/ug/l]	Resp (Flag)
9	200	135	1350.06		
24	1000	649	6490.70		
59	10000	8098	80981.61		

Mass	Resp Ratio	Resp Ratio (Required)	Resp Ratio (Flag)
9		-	
24		-	
59		-	

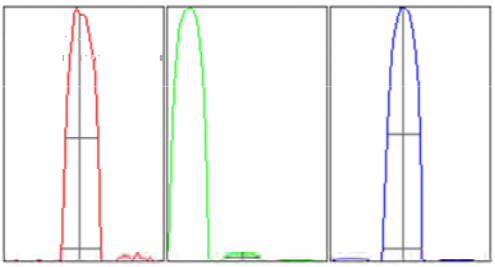
Mass	RSD%	RSD% (Required)	RSD% (Flag)
9	9.824	5.000	Fail
24	4.136	5.000	
59	1.925	5.000	

Mass	Background	Background (Required)	Background (Flag)
9	0.300		
24	0.200		
59	0.100		

Oxide/Doubly Charged Ratio

Oxide	156 / 140 1.161 %
Doubly Charged	70 / 140 0.867 %

Resolution/Axis



Integration Time [sec]	0.1
Acquisition Time [sec]	22.24
Y Axis	Linear

Mass	Peak Height	Axis	Axis (Required)	Axis (Flag)
9	132.26	8.95	8.90 - 9.10	
24	664.19	23.95	23.90 - 24.10	
59	8229.16	58.90	58.90 - 59.10	

Mass	W-50%	W-5%	W-5% (Required)	W-5% (Flag)
9	0.62	0.738		
24	0.66	0.743		

Tune Check Report

Mass	W-50%	W-5%	W-5% (Required)	W-5% (Flag)
59	0.60	0.738		

Tune Parameters

Plasma Parameters

Plasma Mode	---	Nebulizer Gas	0.48 L/min	Dilution Gas	0.55 L/min
RF Power	1600 W	Option Gas	---	Auxiliary Gas	0.90 L/min
RF Matching	1.80 V	Nebulizer Pump	0.10 rps	Plasma Gas	15.0 L/min
Sample Depth	8.0 mm	S/C Temp	2 °C		

Lens Parameters

Extract 1	0.0 V	Omega Lens	10.0 V	Deflect	0.2 V
Extract 2	-195.0 V	Cell Entrance	-40 V	Plate Bias	-60 V
Omega Bias	-80 V	Cell Exit	-60 V		

Cell Parameters

Use Gas	Yes	3rd Gas Flow	---	Energy Discrimination	3.0 V
He Flow	3.8 mL/min	OctP Bias	-18.0 V		
H2 Flow	---	OctP RF	200 V		

QP Parameters

Mass Gain	133	Axis Gain	1.0005	QP Bias	-15.0 V
Mass Offset	125	Axis Offset	0.04		

Hardware Settings

Torch

Torch H	0.9 mm	Torch V	-0.5 mm

EM

Discriminator	4.4 mV	Analog HV	2601 V	Pulse HV	1377 V

QUALITY CONTROL SUMMARY REPORT
LHAAP-58 December 2021
SEMI-ANNUAL SAMPLING EVENT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

March 2022

Prepared For:

Longhorn Army Ammunition Plant
Karnack, Texas

Under Contract To:

U.S. Army Corps of Engineers
Tulsa District
Tulsa, Oklahoma

Contract Number: W9128F-13-D-0012
Task Order Number: W912BV17F0150

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Table 1: Field Sample Identification and Laboratory Packages
Table 2: Qualified Analytical Data
Table 3: Completeness by Method

1 INTRODUCTION

Bhate reviewed two data packages from ALS Environmental, Houston, Texas with the analyses for volatile fatty acids subcontracted to ALS Rochester, NY; and the analyses of carbon dioxide to PACE Analytical Baton Rouge, LA. The dechlorinating bacteria analysis was subcontracted to Microbial Insights in Knoxville, TN. Groundwater samples were collected on December 1-2, 2021, from Site LHAAP-58 at the Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas. Data were reviewed for conformance to the requirements of the following guidance documents: [United States Environmental Protection Agency] *USEPA Contract Laboratory Program* [CLP] *National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA, November 2020); *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (USEPA, November 2020); and the *Final Basewide Uniform Federal Policy (UFP) – Quality Assurance Project Plan (QAPP) Longhorn Army Ammunition Plant* (Bhate, May 2018).

1.1 Intended Use of Data

The objective of sampling at LHAAP-58 in December 2021 was to complete a semi-annual sampling event.

Analyses performed include:

- RSK-175 – Dissolved Gases
- E415.1 – Total Organic Carbon
- SW8260C – Volatile Organic Compounds (VOCs)
- SW9056A – Anions (chloride, nitrate, and sulfate)
- High Performance Liquid Chromatography (HPLC)- Organic Acids – Volatile Fatty Acids (VFAs)
- CENSUS – Dechlorinating Bacteria (dehalococcoides [DHC]/dehalobacter [DHB])
- SW6020A - Arsenic

Table 1 lists the sample (ID) identification numbers and their associated laboratory package.

Table 2 lists qualified results with the qualification flag and reason code.

The following narrative is a brief synopsis of data that required qualification due to quality control discrepancies.

1.2 Preservation and Holding Times

Sample identification data were evaluated for agreement with the chain-of-custody (COC). All samples were received in appropriate containers, within the proper temperature range, in good condition, and within the required hold time with the following exception:

- Sample 35AWW23_120121 originally ran with in holding time at 10X dilution for nitrate, re-analyzed was performed outside hold time at 1X and nitrate was flagged estimated "J".

1.3 Calibrations

All analytes reported must be present in the initial and continuing calibration. The calibrations must meet the acceptance criteria specified in Worksheet 24 (Analytical Instrument Calibration) of the QAPP. All results reported must be within the calibration range. Samples were diluted, if necessary, to bring analyte responses within the calibration range.

1.3.1 Continuing Calibration Verifications

The calibrations must meet the following criteria otherwise the compound is qualified J or UJ: The continuing calibration verification (CCV) criteria are 20 percent difference (%D) for VOCs and 50% for closing CCVs. Metals and general chemistry - 10%D; VFAs, dissolved gases, and TOC - 15%D.

The CCV recovery for bromomethane was outside control limits for samples 35AWW11_120121, 35AWW23_120121, 35AWW19_120121, LHSMW07_120121, 35AWW20_120121, 35AWW06_120121. The CCV recoveries of 2,2-dichloropropane, chloromethane and acetone were outside control limits for samples 35AWW24_120221, 35AWW05_120221, 35AWW15_120221, LHSMW06_120221 and LHSMW06_120221_a. All were considered estimated “UJ”.

1.4 Blanks

If the analyte result for an associated sample was less than 5x (10x for common laboratory contaminants) the analyte concentration in the blank, that result was qualified “UB” and considered an artifact of blank contamination. Where the sample result for the affected analyte was non-detect or greater than 5x (10x) the amount in the blank, no qualifier was applied.

No data required qualification.

1.5 Surrogates

Surrogates were evaluated using limits defined by each method in the project-specific QAPP Worksheet 28.

No surrogates were reported outside control limits.

1.6 Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

The LCS/LCSD recoveries were within control limits.

1.7 Matrix Spike (MS)/Matrix Spike Duplicate Sample (MSD)

MS/MSD recoveries were evaluated using limits defined in Worksheet 15 of the project-specific QAPP. When sample results were greater than 4x the spike amount, control limits were not applicable and require no qualification. Furthermore, if a MS/MSD analyses was performed on a batched (unrelated) sample no qualification was made to the sample data.

The MS recovery of Total Organic Carbon (TOC) was above control limits in the spiked sample 35AWW20_120121and flagged estimated “J”. The MS and MSD recoveries of

dichlorodifluoromethane in spiked sample 35AWW11_120121 were below control limits and flagged "UJ".

1.8 Internal Standards

If the percent recovery (%R) for an internal standard in a sample is not within the limit, the associated sample is qualified for those analytes associated with the internal standard(s) outside of the limit.

Internal standards were within acceptance criteria for the associated compounds.

1.9 Field Precision

Precision is the measure of variability of individual sample measurements. Evaluation of field duplicates for precision was done using the relative percent difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. Field duplicate RPD limits were set at <30% for groundwater.

The RPD for all compounds was within project limits.

2.0 DATA USABILITY SUMMARY

The data are usable for the intended purposes of the project (see Table 3). The data quality objectives have been met for the project.

Table 1: Field Sample Identification and Laboratory Packages

Client Sample ID	Lab Package/ID	E415.1	SW8260C	HPLC-Organic Acids	SW9056A	RSK-175	CENSUS	Arsenic 6020A
35AWW05_120221	HS21120243		X					
35AWW06_120121	HS21120103	X	X	X	X	X	X	
35AWW11_120121	HS21120103	X	X	X	X	X	X	
35AWW15_120221	HS21120243		X					
35AWW19_120121	HS21120103	X	X	X	X	X	X	
35AWW20_120121	HS21120103	X	X	X	X	X	X	X
35AWW23_120121	HS21120103	X	X	X	X	X	X	
35AWW24_120221	HS21120243		X					
35AWW04	Dry							
LHSMW04	Dry							
LHSMW06_120221	HS21120243		X					X
LHSMW06_120221_a	HS21120243		X					X
LHSMW07_120121	HS21120103	X	X	X	X	X	X	

Table 2: Qualified Analytical Data

Client Sample ID Laboratory	Laboratory Package	Analyte Name	Result and Qualifier	Reason for Qualification
35AWW05_120221	HS21120243	2,2-Dichloropropane Chloromethane Acetone	< 0.50 UJ < 0.50 UJ < 2.0 UJ	CCV CCV CCV
35AWW06_120121	HS21120103	Bromomethane	< 1.0 UJ	CCV
35AWW11_120121	HS21120103	Bromomethane Dichlorodifluoromethane	< 1.0 UJ < 1.0 UJ	CCV MS/MSD <
35AWW15_120221	HS21120243	2,2-Dichloropropane Chloromethane Acetone	< 0.50 UJ < 0.50 UJ < 2.0 UJ	CCV CCV CCV
35AWW19_120121	HS21120103	Bromomethane	< 1.0 UJ	CCV
35AWW20_120121	HS21120103	Bromomethane Total Organic Carbon	< 1.0 UJ 19.3 J	CCV MS >
35AWW23_120121	HS21120103	Bromomethane Nitrate	< 1.0 UJ 0.0811 J	CCV HT
35AWW24_120221	HS21120243	2,2-Dichloropropane Chloromethane Acetone	< 0.50 UJ < 0.50 UJ < 2.0 UJ	CCV CCV CCV
LHSMW06_120221	HS21120243	2,2-Dichloropropane Chloromethane Acetone	< 0.50 UJ < 0.50 UJ < 2.0 UJ	CCV CCV CCV
LHSMW06_120221_a	HS21120243	2,2-Dichloropropane Chloromethane Acetone	< 0.50 UJ < 0.50 UJ < 2.0 UJ	CCV CCV CCV
LHSMW07_120121	HS21120103	Bromomethane	< 1.0 UJ	CCV

Notes
J – Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
UJ – The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
HT – hold time exceedance
CCV< – continuing calibration verification outside control limits
MS/MSD <>– matrix spike/duplicate recoveries below control limits

Table 3: Completeness by Method

Method	No. of Rejected Results	% Completeness
E415.1	0	100
SW8260C	0	100
HPLC-Organic Acids	0	100
SW9056A	0	100
RSK-175	0	100
CENSUS	0	100
SW6020A	0	100

10515 Research Drive
Knoxville, TN 37932
Phone: (865) 573-8188
Fax: (865) 573-8133

Client: Shannon Tyrell-Swadis
ALS Laboratory Group
10450 Stancliff Rd
Suite 210
Houston, TX 77040

Phone:

Fax:

Identifier: 040TF **Date Rec:** 06/10/2022 **Report Date:** 06/16/2022

Client Project #: NWO1312.0150 **Client Project Name:** LHAAP / Site58

Purchase Order #: HS18030472

Test results provided for: CENSUS

Reviewed By:



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Results relate only to the items tested and the sample(s) as received by the laboratory.

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **ALS Laboratory Group**
Project: LHAAP / Site58

MI Project Number: **040TF**
Date Received: 06/10/2022

Sample Information

Client Sample ID:		**35AWW19_060822**	**35AWW23_060822**	**35AWW06_060822**	**LHSMW07_060822**	**35AWW20_060822**
Sample Date:		06/08/2022	06/08/2022	06/08/2022	06/08/2022	06/08/2022
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		BB/CS	BB/CS	BB/CS	BB/CS	BB/CS
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**1.38E+02**	**1.58E+02**	**7.20E+00**	**4.68E+03**	**7.04E+04**
tceA Reductase	TCE	**5.12E+01**	**4.16E+01**	**3.00E-01 (J)**	**8.00E-01**	**1.00E+00**
BAV1 Vinyl Chloride Reductase	BVC	**7.13E+01**	**2.80E+00**	**4.00E-01 (J)**	**4.00E-01 (J)**	**6.74E+04**
Vinyl Chloride Reductase	VCR	**1.34E+01**	**6.39E+01**	<7.00E-01	**6.23E+02**	**1.80E+00**
Dehalobacter spp.	*DHBt*	**2.96E+03**	**1.29E+04**	**1.07E+03**	**2.85E+03**	**1.84E+04**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **ALS Laboratory Group**
Project: LHAAP / Site58

MI Project Number: **040TF**
Date Received: 06/10/2022

Sample Information

Client Sample ID:	**35AWW11_060822**
Sample Date:	06/08/2022
Units:	cells/mL
Analyst/Reviewer:	BB/CS

Dechlorinating Bacteria

Dehalococcoides	*DHC*	**1.75E+03**
tceA Reductase	TCE	**3.00E-01 (J)**
BAV1 Vinyl Chloride Reductase	BVC	**1.90E+00**
Vinyl Chloride Reductase	VCR	**1.41E+02**
Dehalobacter spp.	*DHBt*	**1.37E+05**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

Quality Assurance/Quality Control Data

Samples Received **6/10/2022**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	06/10/2022	06/16/2022	0 °C	110%	non-detect	non-detect
BVC	06/10/2022	06/16/2022	0 °C	101%	non-detect	non-detect
DHBt	06/10/2022	06/16/2022	0 °C	105%	non-detect	non-detect
TCE	06/10/2022	06/16/2022	0 °C	106%	non-detect	non-detect
VCR	06/10/2022	06/16/2022	0 °C	94%	non-detect	non-detect

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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June 21, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22060438**

Laboratory Results for: **LHAAP-58**

Dear Marcia Olive,

ALS Environmental received 12 sample(s) on Jun 08, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
Dane J. Wacasey

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS22060438

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS22060438-01	03WW01_060622	Groundwater		06-Jun-2022 07:35	08-Jun-2022 10:00	☐
HS22060438-02	35AWW08_060622	Groundwater		06-Jun-2022 08:15	08-Jun-2022 10:00	☐
HS22060438-03	35AWW01_060622	Groundwater		06-Jun-2022 09:00	08-Jun-2022 10:00	☐
HS22060438-04	35AWW01_060622_a	Groundwater		06-Jun-2022 09:00	08-Jun-2022 10:00	☐
HS22060438-05	35AWW09_060622	Groundwater		06-Jun-2022 09:45	08-Jun-2022 10:00	☐
HS22060438-06	35AWW13_060622	Groundwater		06-Jun-2022 10:35	08-Jun-2022 10:00	☐
HS22060438-07	35AWW10_060622	Groundwater		06-Jun-2022 11:15	08-Jun-2022 10:00	☐
HS22060438-08	35AWW22_060622	Groundwater		06-Jun-2022 12:00	08-Jun-2022 10:00	☐
HS22060438-09	35AWW12_060622	Groundwater		06-Jun-2022 12:45	08-Jun-2022 10:00	☐
HS22060438-10	35AWW12_060622_a	Groundwater		06-Jun-2022 12:45	08-Jun-2022 10:00	☐
HS22060438-11	35AWW14_060622	Groundwater		06-Jun-2022 13:00	08-Jun-2022 10:00	☐
HS22060438-12	Trip Blank	Water		06-Jun-2022 00:00	08-Jun-2022 10:00	☐

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS22060438

CASE NARRATIVE

GCMS Volatiles by Method SW8260

Batch ID: R410438

Sample ID: 35AWW08_060622 (HS22060438-02)

- Lowest practical dilution due to matrix. Sample is foamy.

Batch ID: R410346

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020A

Batch ID: 180102

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 03WW01_060622
Collection Date: 06-Jun-2022 07:35

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 13:47
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 13:47
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 13:47
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 13:47
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 13:47
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 13:47
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 13:47
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 13:47
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 13:47
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 13:47
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 13:47
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	10-Jun-2022 13:47
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 13:47
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 13:47
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 13:47
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 13:47
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 13:47
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 13:47
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 13:47
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 13:47
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 13:47
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 13:47
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 13:47
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	10-Jun-2022 13:47
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 13:47
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 13:47
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	10-Jun-2022 13:47
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 13:47
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 13:47
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 13:47
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 13:47
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 13:47
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 13:47
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 13:47
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	10-Jun-2022 13:47
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 13:47
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 13:47
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 13:47
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 13:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 03WW01_060622
Collection Date: 06-Jun-2022 07:35

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 13:47
cis-1,2-Dichloroethene	**7.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Jun-2022 13:47
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 13:47
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 13:47
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 13:47
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 13:47
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 13:47
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	10-Jun-2022 13:47
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 13:47
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 13:47
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 13:47
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 13:47
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 13:47
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 13:47
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 13:47
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 13:47
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 13:47
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 13:47
Tetrachloroethene	**9.9**		**0.30**	**1.0**	**1.0**	**ug/L**	1	10-Jun-2022 13:47
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 13:47
trans-1,2-Dichloroethene	**0.74**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Jun-2022 13:47
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 13:47
Trichloroethene	**10**		**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Jun-2022 13:47
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 13:47
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 13:47
Surr: 1,2-Dichloroethane-d4	*92.6*			**0**	*81-118*	*%REC*	*1*	*10-Jun-2022 13:47*
Surr: 4-Bromofluorobenzene	*93.0*			**0**	*85-114*	*%REC*	*1*	*10-Jun-2022 13:47*
Surr: Dibromofluoromethane	*94.9*			**0**	*80-119*	*%REC*	*1*	*10-Jun-2022 13:47*
Surr: Toluene-d8	*99.2*			**0**	*89-112*	*%REC*	*1*	*10-Jun-2022 13:47*
METALS BY ICPMS BY SW6020A		**Method:SW6020A**				Prep:SW3010A / 17-Jun-2022		Analyst: JC
Arsenic	**0.00955**		**0.000400**	**0.00125**	**0.00500**	**mg/L**	1	20-Jun-2022 13:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW08_060622
Collection Date: 06-Jun-2022 08:15

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
1,1,1-Trichloroethane	2.5	U	1.0	2.5	5.0	ug/L	5	10-Jun-2022 14:08
1,1,2,2-Tetrachloroethane	5.0	U	2.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
1,1-Dichloroethane	2.5	U	1.0	2.5	5.0	ug/L	5	10-Jun-2022 14:08
1,1-Dichloroethene	2.5	U	1.0	2.5	5.0	ug/L	5	10-Jun-2022 14:08
1,1-Dichloropropene	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
1,2,3-Trichlorobenzene	5.0	U	2.0	5.0	5.0	ug/L	5	10-Jun-2022 14:08
1,2,3-Trichloropropane	5.0	U	2.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
1,2,4-Trichlorobenzene	5.0	U	2.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
1,2,4-Trimethylbenzene	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
1,2-Dibromo-3-chloropropane	5.0	U	1.0	5.0	5.0	ug/L	5	10-Jun-2022 14:08
1,2-Dibromoethane	2.5	U	1.0	2.5	5.0	ug/L	5	10-Jun-2022 14:08
1,2-Dichlorobenzene	5.0	U	2.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	ug/L	5	10-Jun-2022 14:08
1,2-Dichloropropane	5.0	U	2.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
1,3,5-Trimethylbenzene	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
1,3-Dichlorobenzene	5.0	U	2.0	5.0	5.0	ug/L	5	10-Jun-2022 14:08
1,3-Dichloropropane	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
1,4-Dichlorobenzene	5.0	U	2.0	5.0	5.0	ug/L	5	10-Jun-2022 14:08
2,2-Dichloropropane	2.5	U	1.0	2.5	5.0	ug/L	5	10-Jun-2022 14:08
2-Butanone	5.0	U	2.5	5.0	10	ug/L	5	10-Jun-2022 14:08
2-Chlorotoluene	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
2-Hexanone	10	U	5.0	10	10	ug/L	5	10-Jun-2022 14:08
4-Chlorotoluene	5.0	U	2.0	5.0	5.0	ug/L	5	10-Jun-2022 14:08
4-Isopropyltoluene	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
4-Methyl-2-pentanone	10	U	3.5	10	10	ug/L	5	10-Jun-2022 14:08
Acetone	10	U	2.0	10	10	ug/L	5	10-Jun-2022 14:08
Benzene	2.5	U	1.0	2.5	5.0	ug/L	5	10-Jun-2022 14:08
Bromobenzene	5.0	U	2.0	5.0	5.0	ug/L	5	10-Jun-2022 14:08
Bromochloromethane	2.5	U	1.0	2.5	5.0	ug/L	5	10-Jun-2022 14:08
Bromodichloromethane	2.5	U	1.0	2.5	5.0	ug/L	5	10-Jun-2022 14:08
Bromoform	5.0	U	2.0	5.0	5.0	ug/L	5	10-Jun-2022 14:08
Bromomethane	5.0	U	2.0	5.0	5.0	ug/L	5	10-Jun-2022 14:08
Carbon disulfide	10	U	3.0	10	10	ug/L	5	10-Jun-2022 14:08
Carbon tetrachloride	5.0	U	2.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
Chlorobenzene	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
Chloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
Chloroform	2.5	U	1.0	2.5	5.0	ug/L	5	10-Jun-2022 14:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW08_060622
Collection Date: 06-Jun-2022 08:15

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	2.5	U	1.0	2.5	5.0	ug/L	5	10-Jun-2022 14:08
cis-1,2-Dichloroethene	2.5	U	1.0	2.5	5.0	ug/L	5	10-Jun-2022 14:08
cis-1,3-Dichloropropene	2.5	U	1.0	2.5	5.0	ug/L	5	10-Jun-2022 14:08
Dibromochloromethane	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
Dibromomethane	2.5	U	1.0	2.5	5.0	ug/L	5	10-Jun-2022 14:08
Dichlorodifluoromethane	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
Ethylbenzene	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
Hexachlorobutadiene	5.0	U	5.0	5.0	5.0	ug/L	5	10-Jun-2022 14:08
Isopropylbenzene	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
m,p-Xylene	5.0	U	2.5	5.0	10	ug/L	5	10-Jun-2022 14:08
Methylene chloride	10	U	2.0	10	10	ug/L	5	10-Jun-2022 14:08
n-Butylbenzene	5.0	U	2.0	5.0	5.0	ug/L	5	10-Jun-2022 14:08
n-Propylbenzene	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
Naphthalene	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
o-Xylene	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
sec-Butylbenzene	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
Styrene	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
tert-Butylbenzene	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
Tetrachloroethene	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
Toluene	2.5	U	1.0	2.5	5.0	ug/L	5	10-Jun-2022 14:08
trans-1,2-Dichloroethene	**3.9**	J	**1.0**	**2.5**	**5.0**	**ug/L**	5	10-Jun-2022 14:08
trans-1,3-Dichloropropene	2.5	U	1.0	2.5	5.0	ug/L	5	10-Jun-2022 14:08
Trichloroethene	2.5	U	1.0	2.5	5.0	ug/L	5	10-Jun-2022 14:08
Trichlorofluoromethane	5.0	U	1.5	5.0	5.0	ug/L	5	10-Jun-2022 14:08
Vinyl chloride	2.5	U	1.0	2.5	5.0	ug/L	5	10-Jun-2022 14:08
Surr: 1,2-Dichloroethane-d4	*90.5*			**0**	*81-118*	*%REC*	*5*	*10-Jun-2022 14:08*
Surr: 4-Bromofluorobenzene	*93.8*			**0**	*85-114*	*%REC*	*5*	*10-Jun-2022 14:08*
Surr: Dibromofluoromethane	*92.0*			**0**	*80-119*	*%REC*	*5*	*10-Jun-2022 14:08*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*5*	*10-Jun-2022 14:08*
METALS BY ICPMS BY SW6020A		**Method:SW6020A**				Prep:SW3010A / 17-Jun-2022		Analyst: JC
Arsenic	**0.0314**		**0.000800**	**0.00250**	**0.0100**	**mg/L**	2	20-Jun-2022 13:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW01_060622
Collection Date: 06-Jun-2022 09:00

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 18:56
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 18:56
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 18:56
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 18:56
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 18:56
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 18:56
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 18:56
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	09-Jun-2022 18:56
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 18:56
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 18:56
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 18:56
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 18:56
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 18:56
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 18:56
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 18:56
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	09-Jun-2022 18:56
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	09-Jun-2022 18:56
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 18:56
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	09-Jun-2022 18:56
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	09-Jun-2022 18:56
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 18:56
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 18:56
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 18:56
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 18:56
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 18:56
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 18:56
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	09-Jun-2022 18:56
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 18:56
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 18:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW01_060622
Collection Date: 06-Jun-2022 09:00

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 18:56
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 18:56
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 18:56
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 18:56
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	09-Jun-2022 18:56
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	09-Jun-2022 18:56
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	09-Jun-2022 18:56
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 18:56
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 18:56
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 18:56
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 18:56
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 18:56
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 18:56
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 18:56
Surr: 1,2-Dichloroethane-d4	*91.8*			**0**	*81-118*	*%REC*	*1*	*09-Jun-2022 18:56*
Surr: 4-Bromofluorobenzene	*93.3*			**0**	*85-114*	*%REC*	*1*	*09-Jun-2022 18:56*
Surr: Dibromofluoromethane	*94.0*			**0**	*80-119*	*%REC*	*1*	*09-Jun-2022 18:56*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*09-Jun-2022 18:56*
METALS BY ICPMS BY SW6020A		**Method:SW6020A**				Prep:SW3010A / 17-Jun-2022		Analyst: JC
Arsenic	**0.000828**	J	**0.000400**	**0.00125**	**0.00500**	**mg/L**	1	20-Jun-2022 13:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW01_060622_a
Collection Date: 06-Jun-2022 09:00

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:17
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 19:17
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:17
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:17
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:17
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 19:17
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 19:17
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	09-Jun-2022 19:17
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:17
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 19:17
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:17
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 19:17
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:17
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:17
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:17
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	09-Jun-2022 19:17
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	09-Jun-2022 19:17
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:17
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	09-Jun-2022 19:17
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	09-Jun-2022 19:17
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:17
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:17
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:17
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:17
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:17
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:17
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	09-Jun-2022 19:17
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 19:17
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW01_060622_a
Collection Date: 06-Jun-2022 09:00

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:17
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:17
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:17
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:17
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	09-Jun-2022 19:17
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	09-Jun-2022 19:17
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	09-Jun-2022 19:17
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:17
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:17
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:17
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:17
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:17
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:17
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:17
Surr: 1,2-Dichloroethane-d4	*92.2*			**0**	*81-118*	*%REC*	*1*	*09-Jun-2022 19:17*
Surr: 4-Bromofluorobenzene	*94.1*			**0**	*85-114*	*%REC*	*1*	*09-Jun-2022 19:17*
Surr: Dibromofluoromethane	*93.4*			**0**	*80-119*	*%REC*	*1*	*09-Jun-2022 19:17*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*09-Jun-2022 19:17*
METALS BY ICPMS BY SW6020A		**Method:SW6020A**				Prep:SW3010A / 17-Jun-2022		Analyst: JC
Arsenic	**0.000915**	J	**0.000400**	**0.00125**	**0.00500**	**mg/L**	1	20-Jun-2022 13:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW09_060622
Collection Date: 06-Jun-2022 09:45

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 14:29
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 14:29
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 14:29
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 14:29
1,1-Dichloroethane	**0.59**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Jun-2022 14:29
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 14:29
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 14:29
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 14:29
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 14:29
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 14:29
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 14:29
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	10-Jun-2022 14:29
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 14:29
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 14:29
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 14:29
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 14:29
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 14:29
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 14:29
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 14:29
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 14:29
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 14:29
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 14:29
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 14:29
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	10-Jun-2022 14:29
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 14:29
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 14:29
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	10-Jun-2022 14:29
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 14:29
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 14:29
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 14:29
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 14:29
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 14:29
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 14:29
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 14:29
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	10-Jun-2022 14:29
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 14:29
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 14:29
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 14:29
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 14:29

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW09_060622
Collection Date: 06-Jun-2022 09:45

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 14:29
cis-1,2-Dichloroethene	**1.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Jun-2022 14:29
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 14:29
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 14:29
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 14:29
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 14:29
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 14:29
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	10-Jun-2022 14:29
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 14:29
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 14:29
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 14:29
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 14:29
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 14:29
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 14:29
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 14:29
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 14:29
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 14:29
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 14:29
Tetrachloroethene	**380**		**3.0**	**10**	**10**	**ug/L**	10	10-Jun-2022 15:32
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 14:29
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 14:29
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 14:29
Trichloroethene	**140**		**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Jun-2022 14:29
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 14:29
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 14:29
Surr: 1,2-Dichloroethane-d4	*91.2*			**0**	*81-118*	*%REC*	*1*	*10-Jun-2022 14:29*
Surr: 1,2-Dichloroethane-d4	*91.8*			**0**	*81-118*	*%REC*	*10*	*10-Jun-2022 15:32*
Surr: 4-Bromofluorobenzene	*95.3*			**0**	*85-114*	*%REC*	*1*	*10-Jun-2022 14:29*
Surr: 4-Bromofluorobenzene	*93.1*			**0**	*85-114*	*%REC*	*10*	*10-Jun-2022 15:32*
Surr: Dibromofluoromethane	*93.4*			**0**	*80-119*	*%REC*	*1*	*10-Jun-2022 14:29*
Surr: Dibromofluoromethane	*93.4*			**0**	*80-119*	*%REC*	*10*	*10-Jun-2022 15:32*
Surr: Toluene-d8	*98.9*			**0**	*89-112*	*%REC*	*1*	*10-Jun-2022 14:29*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*10*	*10-Jun-2022 15:32*
METALS BY ICPMS BY SW6020A		**Method:SW6020A**				Prep:SW3010A / 17-Jun-2022		Analyst: JC
Arsenic	**0.000526**	J	**0.000400**	**0.00125**	**0.00500**	**mg/L**	1	20-Jun-2022 13:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW13_060622
Collection Date: 06-Jun-2022 10:35

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:35
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 16:35
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:35
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:35
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:35
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 16:35
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 16:35
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	10-Jun-2022 16:35
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:35
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 16:35
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:35
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 16:35
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:35
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:35
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:35
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 16:35
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	10-Jun-2022 16:35
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:35
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	10-Jun-2022 16:35
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 16:35
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:35
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:35
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:35
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:35
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:35
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:35
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	10-Jun-2022 16:35
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 16:35
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW13_060622
Collection Date: 06-Jun-2022 10:35

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:35
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:35
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:35
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:35
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	10-Jun-2022 16:35
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 16:35
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 16:35
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:35
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:35
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:35
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:35
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:35
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:35
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:35
Surr: 1,2-Dichloroethane-d4	*92.0*			**0**	*81-118*	*%REC*	*1*	*10-Jun-2022 16:35*
Surr: 4-Bromofluorobenzene	*93.1*			**0**	*85-114*	*%REC*	*1*	*10-Jun-2022 16:35*
Surr: Dibromofluoromethane	*93.8*			**0**	*80-119*	*%REC*	*1*	*10-Jun-2022 16:35*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*10-Jun-2022 16:35*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW10_060622
Collection Date: 06-Jun-2022 11:15

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:57
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 16:57
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:57
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:57
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:57
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 16:57
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 16:57
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	10-Jun-2022 16:57
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:57
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 16:57
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:57
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 16:57
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:57
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:57
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:57
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 16:57
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	10-Jun-2022 16:57
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:57
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	10-Jun-2022 16:57
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 16:57
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:57
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:57
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:57
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:57
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:57
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:57
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	10-Jun-2022 16:57
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 16:57
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:57

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW10_060622
Collection Date: 06-Jun-2022 11:15

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:57
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:57
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:57
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:57
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	10-Jun-2022 16:57
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 16:57
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 16:57
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:57
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:57
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:57
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:57
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:57
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:57
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:57
Surr: 1,2-Dichloroethane-d4	*90.0*			**0**	*81-118*	*%REC*	*1*	*10-Jun-2022 16:57*
Surr: 4-Bromofluorobenzene	*94.8*			**0**	*85-114*	*%REC*	*1*	*10-Jun-2022 16:57*
Surr: Dibromofluoromethane	*93.1*			**0**	*80-119*	*%REC*	*1*	*10-Jun-2022 16:57*
Surr: Toluene-d8	*99.7*			**0**	*89-112*	*%REC*	*1*	*10-Jun-2022 16:57*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP-58 WorkOrder:HS22060438
Sample ID: 35AWW22_060622 Lab ID:HS22060438-08
Collection Date: 06-Jun-2022 12:00 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:18
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 17:18
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:18
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:18
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 17:18
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 17:18
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 17:18
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	10-Jun-2022 17:18
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:18
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 17:18
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:18
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 17:18
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 17:18
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 17:18
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:18
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 17:18
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	10-Jun-2022 17:18
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 17:18
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	10-Jun-2022 17:18
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 17:18
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:18
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 17:18
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:18
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:18
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 17:18
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 17:18
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	10-Jun-2022 17:18
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 17:18
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW22_060622
Collection Date: 06-Jun-2022 12:00

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:18
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:18
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:18
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:18
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	10-Jun-2022 17:18
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 17:18
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 17:18
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 17:18
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:18
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:18
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:18
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:18
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:18
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:18
Surr: 1,2-Dichloroethane-d4	*90.0*			**0**	*81-118*	*%REC*	*1*	*10-Jun-2022 17:18*
Surr: 4-Bromofluorobenzene	*92.5*			**0**	*85-114*	*%REC*	*1*	*10-Jun-2022 17:18*
Surr: Dibromofluoromethane	*92.8*			**0**	*80-119*	*%REC*	*1*	*10-Jun-2022 17:18*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*10-Jun-2022 17:18*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW12_060622
Collection Date: 06-Jun-2022 12:45

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:38
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 19:38
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:38
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:38
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:38
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 19:38
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 19:38
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	09-Jun-2022 19:38
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:38
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 19:38
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:38
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 19:38
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:38
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:38
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:38
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	09-Jun-2022 19:38
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	09-Jun-2022 19:38
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:38
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	09-Jun-2022 19:38
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	09-Jun-2022 19:38
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:38
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:38
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:38
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:38
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:38
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:38
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	09-Jun-2022 19:38
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 19:38
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW12_060622
Collection Date: 06-Jun-2022 12:45

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:38
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:38
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:38
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:38
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	09-Jun-2022 19:38
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	09-Jun-2022 19:38
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	09-Jun-2022 19:38
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:38
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:38
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:38
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:38
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:38
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:38
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:38
Surr: 1,2-Dichloroethane-d4	*91.4*			**0**	*81-118*	*%REC*	*1*	*09-Jun-2022 19:38*
Surr: 4-Bromofluorobenzene	*93.4*			**0**	*85-114*	*%REC*	*1*	*09-Jun-2022 19:38*
Surr: Dibromofluoromethane	*93.1*			**0**	*80-119*	*%REC*	*1*	*09-Jun-2022 19:38*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*09-Jun-2022 19:38*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW12_060622_a
Collection Date: 06-Jun-2022 12:45

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:59
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 19:59
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:59
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:59
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:59
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 19:59
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 19:59
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	09-Jun-2022 19:59
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:59
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 19:59
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:59
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 19:59
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:59
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:59
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:59
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	09-Jun-2022 19:59
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	09-Jun-2022 19:59
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:59
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	09-Jun-2022 19:59
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	09-Jun-2022 19:59
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:59
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:59
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:59
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:59
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:59
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:59
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	09-Jun-2022 19:59
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	09-Jun-2022 19:59
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW12_060622_a
Collection Date: 06-Jun-2022 12:45

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:59
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:59
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:59
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:59
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	09-Jun-2022 19:59
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	09-Jun-2022 19:59
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	09-Jun-2022 19:59
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Jun-2022 19:59
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:59
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:59
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:59
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:59
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Jun-2022 19:59
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	09-Jun-2022 19:59
Surr: 1,2-Dichloroethane-d4	*91.4*			**0**	*81-118*	*%REC*	*1*	*09-Jun-2022 19:59*
Surr: 4-Bromofluorobenzene	*91.1*			**0**	*85-114*	*%REC*	*1*	*09-Jun-2022 19:59*
Surr: Dibromofluoromethane	*93.3*			**0**	*80-119*	*%REC*	*1*	*09-Jun-2022 19:59*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*09-Jun-2022 19:59*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW14_060622
Collection Date: 06-Jun-2022 13:00

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:39
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 17:39
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
1,1-Dichloroethane	**13**		**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Jun-2022 17:39
1,1-Dichloroethene	**9.6**		**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Jun-2022 17:39
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 17:39
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 17:39
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 17:39
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	10-Jun-2022 17:39
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:39
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 17:39
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:39
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 17:39
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 17:39
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 17:39
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:39
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 17:39
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	10-Jun-2022 17:39
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 17:39
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	10-Jun-2022 17:39
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 17:39
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:39
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 17:39
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:39
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:39
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 17:39
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 17:39
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	10-Jun-2022 17:39
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 17:39
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW14_060622
Collection Date: 06-Jun-2022 13:00

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:39
cis-1,2-Dichloroethene	**5.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Jun-2022 17:39
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:39
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:39
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	10-Jun-2022 17:39
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 17:39
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 17:39
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 17:39
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:39
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:39
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:39
Trichloroethene	**13**		**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Jun-2022 17:39
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 17:39
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 17:39
Surr: 1,2-Dichloroethane-d4	*92.1*			**0**	*81-118*	*%REC*	*1*	*10-Jun-2022 17:39*
Surr: 4-Bromofluorobenzene	*94.1*			**0**	*85-114*	*%REC*	*1*	*10-Jun-2022 17:39*
Surr: Dibromofluoromethane	*94.7*			**0**	*80-119*	*%REC*	*1*	*10-Jun-2022 17:39*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*10-Jun-2022 17:39*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: Trip Blank
Collection Date: 06-Jun-2022 00:00

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-12
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:14
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 16:14
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:14
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:14
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:14
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 16:14
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 16:14
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	10-Jun-2022 16:14
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:14
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 16:14
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:14
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 16:14
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:14
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:14
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:14
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 16:14
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	10-Jun-2022 16:14
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:14
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	10-Jun-2022 16:14
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 16:14
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:14
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:14
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:14
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:14
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:14
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:14
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	10-Jun-2022 16:14
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 16:14
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: Trip Blank
Collection Date: 06-Jun-2022 00:00

ANALYTICAL REPORT
WorkOrder:HS22060438
Lab ID:HS22060438-12
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:14
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:14
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:14
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:14
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	10-Jun-2022 16:14
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 16:14
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 16:14
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 16:14
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:14
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:14
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:14
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:14
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 16:14
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 16:14
Surr: 1,2-Dichloroethane-d4	*91.3*			**0**	*81-118*	*%REC*	*1*	*10-Jun-2022 16:14*
Surr: 4-Bromofluorobenzene	*92.5*			**0**	*85-114*	*%REC*	*1*	*10-Jun-2022 16:14*
Surr: Dibromofluoromethane	*93.6*			**0**	*80-119*	*%REC*	*1*	*10-Jun-2022 16:14*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*10-Jun-2022 16:14*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 21-Jun-22

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060438

Batch ID: 180102 **Start Date:** 17 Jun 2022 08:00 **End Date:** 17 Jun 2022 12:00
Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS22060438-01		10 (mL)	10 (mL)	1	120 plastic HNO3
HS22060438-02		10 (mL)	10 (mL)	1	120 plastic HNO3
HS22060438-03		10 (mL)	10 (mL)	1	120 plastic HNO3
HS22060438-04		10 (mL)	10 (mL)	1	120 plastic HNO3
HS22060438-05		10 (mL)	10 (mL)	1	120 plastic HNO3

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060438

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 180102 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS22060438-01	03WW01_060622	06 Jun 2022 07:35		17 Jun 2022 08:00	20 Jun 2022 13:28	1
HS22060438-02	35AWW08_060622	06 Jun 2022 08:15		17 Jun 2022 08:00	20 Jun 2022 13:22	2
HS22060438-03	35AWW01_060622	06 Jun 2022 09:00		17 Jun 2022 08:00	20 Jun 2022 13:10	1
HS22060438-04	35AWW01_060622_a	06 Jun 2022 09:00		17 Jun 2022 08:00	20 Jun 2022 13:24	1
HS22060438-05	35AWW09_060622	06 Jun 2022 09:45		17 Jun 2022 08:00	20 Jun 2022 13:26	1
Batch ID: R410346 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS22060438-03	35AWW01_060622	06 Jun 2022 09:00			09 Jun 2022 18:56	1
HS22060438-04	35AWW01_060622_a	06 Jun 2022 09:00			09 Jun 2022 19:17	1
HS22060438-09	35AWW12_060622	06 Jun 2022 12:45			09 Jun 2022 19:38	1
HS22060438-10	35AWW12_060622_a	06 Jun 2022 12:45			09 Jun 2022 19:59	1
Batch ID: R410438 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS22060438-12	Trip Blank	06 Jun 2022 00:00			10 Jun 2022 16:14	1
Batch ID: R410438 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS22060438-01	03WW01_060622	06 Jun 2022 07:35			10 Jun 2022 13:47	1
HS22060438-02	35AWW08_060622	06 Jun 2022 08:15			10 Jun 2022 14:08	5
HS22060438-05	35AWW09_060622	06 Jun 2022 09:45			10 Jun 2022 15:32	10
HS22060438-05	35AWW09_060622	06 Jun 2022 09:45			10 Jun 2022 14:29	1
HS22060438-06	35AWW13_060622	06 Jun 2022 10:35			10 Jun 2022 16:35	1
HS22060438-07	35AWW10_060622	06 Jun 2022 11:15			10 Jun 2022 16:57	1
HS22060438-08	35AWW22_060622	06 Jun 2022 12:00			10 Jun 2022 17:18	1
HS22060438-11	35AWW14_060622	06 Jun 2022 13:00			10 Jun 2022 17:39	1

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060438

QC BATCH REPORT

Batch ID: 180102 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-180102** Units: **mg/L** Analysis Date: **20-Jun-2022 12:58**
Client ID: Run ID: **ICPMS06_411043** SeqNo: **6702267** PrepDate: **17-Jun-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.00125	0.00500								U

LCS Sample ID: **LCS-180102** Units: **mg/L** Analysis Date: **20-Jun-2022 13:00**
Client ID: Run ID: **ICPMS06_411043** SeqNo: **6702252** PrepDate: **17-Jun-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05235	0.00500	0.05	0	105	84 - 116				

MS Sample ID: **HS22060438-03MS** Units: **mg/L** Analysis Date: **20-Jun-2022 13:14**
Client ID: **35AWW01_060622** Run ID: **ICPMS06_411043** SeqNo: **6702259** PrepDate: **17-Jun-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.04794	0.00500	0.05	0.000828	94.2	84 - 116				

MSD Sample ID: **HS22060438-03MSD** Units: **mg/L** Analysis Date: **20-Jun-2022 13:16**
Client ID: **35AWW01_060622** Run ID: **ICPMS06_411043** SeqNo: **6702260** PrepDate: **17-Jun-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05232	0.00500	0.05	0.000828	103	84 - 116	0.04794	8.74	20	

PDS Sample ID: **HS22060438-03PDS** Units: **mg/L** Analysis Date: **20-Jun-2022 13:18**
Client ID: **35AWW01_060622** Run ID: **ICPMS06_411043** SeqNo: **6702261** PrepDate: **17-Jun-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.12	0.00500	0.1	0.000828	119	80 - 120				

SD Sample ID: **HS22060438-03SD** Units: **mg/L** Analysis Date: **20-Jun-2022 13:12**
Client ID: **35AWW01_060622** Run ID: **ICPMS06_411043** SeqNo: **6702258** PrepDate: **17-Jun-2022** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	0.00625	0.0250					0.000828	0	10	U

The following samples were analyzed in this batch: HS22060438-01 HS22060438-02 HS22060438-03 HS22060438-04 HS22060438-05

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060438

QC BATCH REPORT

Batch ID: R410346 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-220609** Units: **ug/L** Analysis Date: **09-Jun-2022 12:37**
Client ID: Run ID: **VOA6_410346** SeqNo: **6685894** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1.0	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	1.0	1.0								U
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	1.0	1.0								U
1,2,3-Trichlorobenzene	1.0	1.0								U
1,2,3-Trichloropropane	1.0	1.0								U
1,2,4-Trichlorobenzene	1.0	1.0								U
1,2,4-Trimethylbenzene	1.0	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	1.0	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	1.0	1.0								U
1,3,5-Trimethylbenzene	1.0	1.0								U
1,3-Dichlorobenzene	1.0	1.0								U
1,3-Dichloropropane	1.0	1.0								U
1,4-Dichlorobenzene	1.0	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	1.0	1.0								U
2-Hexanone	2.0	2.0								U
4-Chlorotoluene	1.0	1.0								U
4-Isopropyltoluene	1.0	1.0								U
4-Methyl-2-pentanone	2.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	1.0	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	1.0	1.0								U
Bromomethane	1.0	1.0								U

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060438

QC BATCH REPORT

Batch ID: R410346 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-220609** Units: **ug/L** Analysis Date: **09-Jun-2022 12:37**
Client ID: Run ID: **VOA6_410346** SeqNo: **6685894** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	2.0	2.0								U
Carbon tetrachloride	1.0	1.0								U
Chlorobenzene	1.0	1.0								U
Chloroethane	1.0	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	1.0	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	1.0	1.0								U
Ethylbenzene	1.0	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	1.0	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	2.0	2.0								U
Naphthalene	1.0	1.0								U
n-Butylbenzene	1.0	1.0								U
n-Propylbenzene	1.0	1.0								U
o-Xylene	1.0	1.0								U
sec-Butylbenzene	1.0	1.0								U
Styrene	1.0	1.0								U
tert-Butylbenzene	1.0	1.0								U
Tetrachloroethene	1.0	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	1.0	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.8*	*1.0*	*50*	*0*	*89.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.21*	*1.0*	*50*	*0*	*94.4*	*85 - 114*				
Surr: Dibromofluoromethane	*46.63*	*1.0*	*50*	*0*	*93.3*	*80 - 119*				
Surr: Toluene-d8	*50.38*	*1.0*	*50*	*0*	*101*	*89 - 112*				

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060438

QC BATCH REPORT

Batch ID: R410346 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-220609** Units: **ug/L** Analysis Date: **09-Jun-2022 11:55**
Client ID: Run ID: **VOA6_410346** SeqNo: **6685893** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.79	1.0	20	0	98.9	78 - 124				
1,1,1-Trichloroethane	18.97	1.0	20	0	94.8	74 - 131				
1,1,2,2-Tetrachloroethane	18.88	1.0	20	0	94.4	71 - 121				
1,1,2-Trichloroethane	19.51	1.0	20	0	97.5	80 - 119				
1,1-Dichloroethane	19.8	1.0	20	0	99.0	77 - 125				
1,1-Dichloroethene	18.11	1.0	20	0	90.6	71 - 131				
1,1-Dichloropropene	19.23	1.0	20	0	96.2	78 - 125				
1,2,3-Trichlorobenzene	18.63	1.0	20	0	93.1	69 - 129				
1,2,3-Trichloropropane	19.56	1.0	20	0	97.8	73 - 122				
1,2,4-Trichlorobenzene	18.84	1.0	20	0	94.2	69 - 130				
1,2,4-Trimethylbenzene	20.06	1.0	20	0	100	76 - 124				
1,2-Dibromo-3-chloropropane	16.18	1.0	20	0	80.9	62 - 128				
1,2-Dibromoethane	19.37	1.0	20	0	96.8	77 - 121				
1,2-Dichlorobenzene	19.64	1.0	20	0	98.2	80 - 119				
1,2-Dichloroethane	19.63	1.0	20	0	98.1	73 - 128				
1,2-Dichloropropane	19.91	1.0	20	0	99.5	78 - 122				
1,3,5-Trimethylbenzene	19.75	1.0	20	0	98.8	75 - 124				
1,3-Dichlorobenzene	20.16	1.0	20	0	101	80 - 119				
1,3-Dichloropropane	19.42	1.0	20	0	97.1	80 - 119				
1,4-Dichlorobenzene	20.12	1.0	20	0	101	79 - 118				
2,2-Dichloropropane	19.79	1.0	20	0	98.9	60 - 139				
2-Butanone	34.57	2.0	40	0	86.4	56 - 143				
2-Chlorotoluene	19.84	1.0	20	0	99.2	79 - 122				
2-Hexanone	36.52	2.0	40	0	91.3	57 - 139				
4-Chlorotoluene	20.44	1.0	20	0	102	78 - 122				
4-Isopropyltoluene	20.55	1.0	20	0	103	77 - 127				
4-Methyl-2-pentanone	35.76	2.0	40	0	89.4	67 - 130				
Acetone	37.88	2.0	40	0	94.7	39 - 160				
Benzene	19.96	1.0	20	0	99.8	79 - 120				
Bromobenzene	20.53	1.0	20	0	103	80 - 120				
Bromochloromethane	19.39	1.0	20	0	96.9	78 - 123				
Bromodichloromethane	19.13	1.0	20	0	95.7	79 - 125				
Bromoform	19.11	1.0	20	0	95.5	66 - 130				
Bromomethane	17.49	1.0	20	0	87.4	53 - 141				

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060438

QC BATCH REPORT

Batch ID: R410346 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-220609** Units: **ug/L** Analysis Date: **09-Jun-2022 11:55**
Client ID: Run ID: **VOA6_410346** SeqNo: **6685893** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	38.24	2.0	40	0	95.6	64 - 133				
Carbon tetrachloride	17.8	1.0	20	0	89.0	72 - 136				
Chlorobenzene	20.52	1.0	20	0	103	82 - 118				
Chloroethane	18.78	1.0	20	0	93.9	60 - 138				
Chloroform	19.45	1.0	20	0	97.3	79 - 124				
Chloromethane	20.33	1.0	20	0	102	50 - 139				
cis-1,2-Dichloroethene	20.28	1.0	20	0	101	78 - 123				
cis-1,3-Dichloropropene	19.53	1.0	20	0	97.7	75 - 124				
Dibromochloromethane	19.64	1.0	20	0	98.2	74 - 126				
Dibromomethane	19.1	1.0	20	0	95.5	79 - 123				
Dichlorodifluoromethane	18.67	1.0	20	0	93.3	32 - 152				
Ethylbenzene	20.28	1.0	20	0	101	79 - 121				
Hexachlorobutadiene	20.97	1.0	20	0	105	66 - 134				
Isopropylbenzene	18.79	1.0	20	0	94.0	72 - 131				
m,p-Xylene	40.08	2.0	40	0	100	80 - 121				
Methylene chloride	18.73	2.0	20	0	93.6	74 - 124				
Naphthalene	17.06	1.0	20	0	85.3	61 - 128				
n-Butylbenzene	19.92	1.0	20	0	99.6	75 - 128				
n-Propylbenzene	20.16	1.0	20	0	101	76 - 126				
o-Xylene	20.18	1.0	20	0	101	78 - 122				
sec-Butylbenzene	19.61	1.0	20	0	98.1	77 - 126				
Styrene	20.03	1.0	20	0	100	78 - 123				
tert-Butylbenzene	20.13	1.0	20	0	101	78 - 124				
Tetrachloroethene	19.58	1.0	20	0	97.9	74 - 129				
Toluene	20.21	1.0	20	0	101	80 - 121				
trans-1,2-Dichloroethene	19.79	1.0	20	0	99.0	75 - 124				
trans-1,3-Dichloropropene	19.16	1.0	20	0	95.8	73 - 127				
Trichloroethene	19.98	1.0	20	0	99.9	79 - 123				
Trichlorofluoromethane	17.67	1.0	20	0	88.3	65 - 141				
Vinyl chloride	18.21	1.0	20	0	91.0	58 - 137				
Surr: 1,2-Dichloroethane-d4	*47.91*	*1.0*	*50*	*0*	*95.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.02*	*1.0*	*50*	*0*	*98.0*	*85 - 114*				
Surr: Dibromofluoromethane	*49.03*	*1.0*	*50*	*0*	*98.1*	*80 - 119*				
Surr: Toluene-d8	*48.38*	*1.0*	*50*	*0*	*96.8*	*89 - 112*				

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060438

QC BATCH REPORT

Batch ID: R410346 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS22060380-03MS** Units: **ug/L** Analysis Date: **09-Jun-2022 13:19**
Client ID: Run ID: **VOA6_410346** SeqNo: **6685896** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.56	1.0	20	0	103	78 - 124				
1,1,1-Trichloroethane	19.55	1.0	20	0	97.7	74 - 131				
1,1,2,2-Tetrachloroethane	20.28	1.0	20	0	101	71 - 121				
1,1,2-Trichloroethane	19.76	1.0	20	0	98.8	80 - 119				
1,1-Dichloroethane	19.51	1.0	20	0	97.6	77 - 125				
1,1-Dichloroethene	18.86	1.0	20	0	94.3	71 - 131				
1,1-Dichloropropene	20.95	1.0	20	0	105	78 - 125				
1,2,3-Trichlorobenzene	17.61	1.0	20	0	88.1	69 - 129				
1,2,3-Trichloropropane	19.81	1.0	20	0	99.0	73 - 122				
1,2,4-Trichlorobenzene	19.45	1.0	20	0	97.2	69 - 130				
1,2,4-Trimethylbenzene	23.23	1.0	20	0	116	76 - 124				
1,2-Dibromo-3-chloropropane	15.7	1.0	20	0	78.5	62 - 128				
1,2-Dibromoethane	19.59	1.0	20	0	97.9	77 - 121				
1,2-Dichlorobenzene	21.94	1.0	20	0	110	80 - 119				
1,2-Dichloroethane	19.27	1.0	20	0	96.3	73 - 128				
1,2-Dichloropropane	19.92	1.0	20	0	99.6	78 - 122				
1,3,5-Trimethylbenzene	23.46	1.0	20	0	117	75 - 124				
1,3-Dichlorobenzene	22.42	1.0	20	0	112	80 - 119				
1,3-Dichloropropane	19.82	1.0	20	0	99.1	80 - 119				
1,4-Dichlorobenzene	22.56	1.0	20	0	113	79 - 118				
2,2-Dichloropropane	20.17	1.0	20	0	101	60 - 139				
2-Butanone	31.45	2.0	40	0	78.6	56 - 143				
2-Chlorotoluene	22.88	1.0	20	0	114	79 - 122				
2-Hexanone	35.07	2.0	40	0	87.7	57 - 139				
4-Chlorotoluene	23.16	1.0	20	0	116	78 - 122				
4-Isopropyltoluene	24.83	1.0	20	0	124	77 - 127				
4-Methyl-2-pentanone	36.53	2.0	40	0	91.3	67 - 130				
Acetone	24.25	2.0	40	0	60.6	39 - 160				
Benzene	20.49	1.0	20	0	102	79 - 120				
Bromobenzene	23.17	1.0	20	0	116	80 - 120				
Bromochloromethane	18.89	1.0	20	0	94.5	78 - 123				
Bromodichloromethane	18.77	1.0	20	0	93.8	79 - 125				
Bromoform	18.68	1.0	20	0	93.4	66 - 130				
Bromomethane	17.2	1.0	20	0	86.0	53 - 141				

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060438

QC BATCH REPORT

Batch ID: R410346 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS22060380-03MS** Units: **ug/L** Analysis Date: **09-Jun-2022 13:19**
Client ID: Run ID: **VOA6_410346** SeqNo: **6685896** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	39.34	2.0	40	0	98.4	64 - 133				
Carbon tetrachloride	19.93	1.0	20	0	99.6	72 - 136				
Chlorobenzene	21.46	1.0	20	0	107	82 - 118				
Chloroethane	18.25	1.0	20	0	91.2	60 - 138				
Chloroform	18.81	1.0	20	0	94.0	79 - 124				
Chloromethane	17.67	1.0	20	0	88.4	50 - 139				
cis-1,2-Dichloroethene	20.16	1.0	20	0	101	78 - 123				
cis-1,3-Dichloropropene	19.37	1.0	20	0	96.9	75 - 124				
Dibromochloromethane	19.74	1.0	20	0	98.7	74 - 126				
Dibromomethane	19.04	1.0	20	0	95.2	79 - 123				
Dichlorodifluoromethane	13.68	1.0	20	0	68.4	32 - 152				
Ethylbenzene	21.77	1.0	20	0	109	79 - 121				
Hexachlorobutadiene	23.9	1.0	20	0	119	66 - 134				
Isopropylbenzene	21.03	1.0	20	0	105	72 - 131				
m,p-Xylene	43.54	2.0	40	0	109	80 - 121				
Methylene chloride	17.55	2.0	20	0	87.8	74 - 124				
Naphthalene	14.78	1.0	20	0	73.9	61 - 128				
n-Butylbenzene	24.16	1.0	20	0	121	75 - 128				
n-Propylbenzene	24.22	1.0	20	0	121	76 - 126				
o-Xylene	21.33	1.0	20	0	107	78 - 122				
sec-Butylbenzene	24.17	1.0	20	0	121	77 - 126				
Styrene	21.04	1.0	20	0	105	78 - 123				
tert-Butylbenzene	24.38	1.0	20	0	122	78 - 124				
Tetrachloroethene	22.43	1.0	20	0	112	74 - 129				
Toluene	21.44	1.0	20	0	107	80 - 121				
trans-1,2-Dichloroethene	19.99	1.0	20	0	99.9	75 - 124				
trans-1,3-Dichloropropene	18.76	1.0	20	0	93.8	73 - 127				
Trichloroethene	20.85	1.0	20	0	104	79 - 123				
Trichlorofluoromethane	19.12	1.0	20	0	95.6	65 - 141				
Vinyl chloride	17.72	1.0	20	0	88.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*44.49*	*1.0*	*50*	*0*	*89.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.78*	*1.0*	*50*	*0*	*97.6*	*85 - 114*				
Surr: Dibromofluoromethane	*46.51*	*1.0*	*50*	*0*	*93.0*	*80 - 119*				
Surr: Toluene-d8	*50.35*	*1.0*	*50*	*0*	*101*	*89 - 112*				

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060438

QC BATCH REPORT

Batch ID: R410346 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22060380-03MSD** Units: **ug/L** Analysis Date: **09-Jun-2022 13:40**
Client ID: Run ID: **VOA6_410346** SeqNo: **6685897** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.98	1.0	20	0	99.9	78 - 124	20.56	2.9	20	
1,1,1-Trichloroethane	18.93	1.0	20	0	94.6	74 - 131	19.55	3.24	20	
1,1,2,2-Tetrachloroethane	19.56	1.0	20	0	97.8	71 - 121	20.28	3.61	20	
1,1,2-Trichloroethane	19	1.0	20	0	95.0	80 - 119	19.76	3.94	20	
1,1-Dichloroethane	18.78	1.0	20	0	93.9	77 - 125	19.51	3.83	20	
1,1-Dichloroethene	18.21	1.0	20	0	91.0	71 - 131	18.86	3.53	20	
1,1-Dichloropropene	19.98	1.0	20	0	99.9	78 - 125	20.95	4.72	20	
1,2,3-Trichlorobenzene	19.4	1.0	20	0	97.0	69 - 129	17.61	9.63	20	
1,2,3-Trichloropropane	20.89	1.0	20	0	104	73 - 122	19.81	5.3	20	
1,2,4-Trichlorobenzene	20.15	1.0	20	0	101	69 - 130	19.45	3.55	20	
1,2,4-Trimethylbenzene	21.9	1.0	20	0	109	76 - 124	23.23	5.93	20	
1,2-Dibromo-3-chloropropane	16.09	1.0	20	0	80.5	62 - 128	15.7	2.5	20	
1,2-Dibromoethane	19.17	1.0	20	0	95.9	77 - 121	19.59	2.13	20	
1,2-Dichlorobenzene	20.89	1.0	20	0	104	80 - 119	21.94	4.89	20	
1,2-Dichloroethane	19.14	1.0	20	0	95.7	73 - 128	19.27	0.666	20	
1,2-Dichloropropane	19.49	1.0	20	0	97.5	78 - 122	19.92	2.17	20	
1,3,5-Trimethylbenzene	21.79	1.0	20	0	109	75 - 124	23.46	7.37	20	
1,3-Dichlorobenzene	21.37	1.0	20	0	107	80 - 119	22.42	4.76	20	
1,3-Dichloropropane	19.43	1.0	20	0	97.2	80 - 119	19.82	1.96	20	
1,4-Dichlorobenzene	21.29	1.0	20	0	106	79 - 118	22.56	5.81	20	
2,2-Dichloropropane	19.29	1.0	20	0	96.5	60 - 139	20.17	4.47	20	
2-Butanone	28.78	2.0	40	0	72.0	56 - 143	31.45	8.85	20	
2-Chlorotoluene	21.33	1.0	20	0	107	79 - 122	22.88	7.05	20	
2-Hexanone	35.26	2.0	40	0	88.1	57 - 139	35.07	0.544	20	
4-Chlorotoluene	21.61	1.0	20	0	108	78 - 122	23.16	6.95	20	
4-Isopropyltoluene	22.95	1.0	20	0	115	77 - 127	24.83	7.87	20	
4-Methyl-2-pentanone	36.28	2.0	40	0	90.7	67 - 130	36.53	0.703	20	
Acetone	24.91	2.0	40	0	62.3	39 - 160	24.25	2.68	20	
Benzene	19.56	1.0	20	0	97.8	79 - 120	20.49	4.61	20	
Bromobenzene	21.78	1.0	20	0	109	80 - 120	23.17	6.15	20	
Bromochloromethane	18.05	1.0	20	0	90.2	78 - 123	18.89	4.59	20	
Bromodichloromethane	18.32	1.0	20	0	91.6	79 - 125	18.77	2.39	20	
Bromoform	18.56	1.0	20	0	92.8	66 - 130	18.68	0.669	20	
Bromomethane	16.44	1.0	20	0	82.2	53 - 141	17.2	4.51	20	

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060438

QC BATCH REPORT

Batch ID: R410346 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22060380-03MSD** Units: **ug/L** Analysis Date: **09-Jun-2022 13:40**
Client ID: Run ID: **VOA6_410346** SeqNo: **6685897** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	36.95	2.0	40	0	92.4	64 - 133	39.34	6.28	20	
Carbon tetrachloride	18.69	1.0	20	0	93.4	72 - 136	19.93	6.43	20	
Chlorobenzene	20.75	1.0	20	0	104	82 - 118	21.46	3.36	20	
Chloroethane	17.73	1.0	20	0	88.6	60 - 138	18.25	2.9	20	
Chloroform	18.28	1.0	20	0	91.4	79 - 124	18.81	2.85	20	
Chloromethane	16.9	1.0	20	0	84.5	50 - 139	17.67	4.46	20	
cis-1,2-Dichloroethene	19.05	1.0	20	0	95.2	78 - 123	20.16	5.68	20	
cis-1,3-Dichloropropene	18.88	1.0	20	0	94.4	75 - 124	19.37	2.55	20	
Dibromochloromethane	19.34	1.0	20	0	96.7	74 - 126	19.74	2.1	20	
Dibromomethane	18.5	1.0	20	0	92.5	79 - 123	19.04	2.92	20	
Dichlorodifluoromethane	12.92	1.0	20	0	64.6	32 - 152	13.68	5.69	20	
Ethylbenzene	21.07	1.0	20	0	105	79 - 121	21.77	3.29	20	
Hexachlorobutadiene	23.11	1.0	20	0	116	66 - 134	23.9	3.34	20	
Isopropylbenzene	20.3	1.0	20	0	101	72 - 131	21.03	3.56	20	
m,p-Xylene	41.59	2.0	40	0	104	80 - 121	43.54	4.56	20	
Methylene chloride	17.04	2.0	20	0	85.2	74 - 124	17.55	2.99	20	
Naphthalene	17.16	1.0	20	0	85.8	61 - 128	14.78	14.9	20	
n-Butylbenzene	22.56	1.0	20	0	113	75 - 128	24.16	6.87	20	
n-Propylbenzene	22.54	1.0	20	0	113	76 - 126	24.22	7.21	20	
o-Xylene	20.8	1.0	20	0	104	78 - 122	21.33	2.52	20	
sec-Butylbenzene	22.64	1.0	20	0	113	77 - 126	24.17	6.55	20	
Styrene	20.49	1.0	20	0	102	78 - 123	21.04	2.67	20	
tert-Butylbenzene	22.76	1.0	20	0	114	78 - 124	24.38	6.85	20	
Tetrachloroethene	21.31	1.0	20	0	107	74 - 129	22.43	5.13	20	
Toluene	20.91	1.0	20	0	105	80 - 121	21.44	2.5	20	
trans-1,2-Dichloroethene	18.92	1.0	20	0	94.6	75 - 124	19.99	5.5	20	
trans-1,3-Dichloropropene	18.07	1.0	20	0	90.3	73 - 127	18.76	3.78	20	
Trichloroethene	19.93	1.0	20	0	99.6	79 - 123	20.85	4.53	20	
Trichlorofluoromethane	17.76	1.0	20	0	88.8	65 - 141	19.12	7.41	20	
Vinyl chloride	16.82	1.0	20	0	84.1	58 - 137	17.72	5.22	20	
Surr: 1,2-Dichloroethane-d4	*46.26*	*1.0*	*50*	*0*	*92.5*	*81 - 118*	*44.49*	*3.91*	*20*	
Surr: 4-Bromofluorobenzene	*48.12*	*1.0*	*50*	*0*	*96.2*	*85 - 114*	*48.78*	*1.35*	*20*	
Surr: Dibromofluoromethane	*46.95*	*1.0*	*50*	*0*	*93.9*	*80 - 119*	*46.51*	*0.942*	*20*	
Surr: Toluene-d8	*50.35*	*1.0*	*50*	*0*	*101*	*89 - 112*	*50.35*	*0*	*20*	

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060438

QC BATCH REPORT

Batch ID: R410346 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:	HS22060438-03	HS22060438-04	HS22060438-09	HS22060438-10

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060438

QC BATCH REPORT

Batch ID: R410438 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-220610** Units: **ug/L** Analysis Date: **10-Jun-2022 12:02**
Client ID: Run ID: **VOA6_410438** SeqNo: **6687819** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1.0	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	1.0	1.0								U
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	1.0	1.0								U
1,2,3-Trichlorobenzene	1.0	1.0								U
1,2,3-Trichloropropane	1.0	1.0								U
1,2,4-Trichlorobenzene	1.0	1.0								U
1,2,4-Trimethylbenzene	1.0	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	1.0	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	1.0	1.0								U
1,3,5-Trimethylbenzene	1.0	1.0								U
1,3-Dichlorobenzene	1.0	1.0								U
1,3-Dichloropropane	1.0	1.0								U
1,4-Dichlorobenzene	1.0	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	1.0	1.0								U
2-Hexanone	2.0	2.0								U
4-Chlorotoluene	1.0	1.0								U
4-Isopropyltoluene	1.0	1.0								U
4-Methyl-2-pentanone	2.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	1.0	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	1.0	1.0								U
Bromomethane	1.0	1.0								U

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060438

QC BATCH REPORT

Batch ID: R410438 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-220610** Units: **ug/L** Analysis Date: **10-Jun-2022 12:02**
Client ID: Run ID: **VOA6_410438** SeqNo: **6687819** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	2.0	2.0								U
Carbon tetrachloride	1.0	1.0								U
Chlorobenzene	1.0	1.0								U
Chloroethane	1.0	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	1.0	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	1.0	1.0								U
Ethylbenzene	1.0	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	1.0	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	2.0	2.0								U
Naphthalene	1.0	1.0								U
n-Butylbenzene	1.0	1.0								U
n-Propylbenzene	1.0	1.0								U
o-Xylene	1.0	1.0								U
sec-Butylbenzene	1.0	1.0								U
Styrene	1.0	1.0								U
tert-Butylbenzene	1.0	1.0								U
Tetrachloroethene	1.0	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	1.0	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.99*	*1.0*	*50*	*0*	*90.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*46.12*	*1.0*	*50*	*0*	*92.2*	*85 - 114*				
Surr: Dibromofluoromethane	*46.59*	*1.0*	*50*	*0*	*93.2*	*80 - 119*				
Surr: Toluene-d8	*50.43*	*1.0*	*50*	*0*	*101*	*89 - 112*				

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060438

QC BATCH REPORT

Batch ID: R410438 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-220610** Units: **ug/L** Analysis Date: **10-Jun-2022 11:20**
Client ID: Run ID: **VOA6_410438** SeqNo: **6687818** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.25	1.0	20	0	96.3	78 - 124				
1,1,1-Trichloroethane	18.19	1.0	20	0	91.0	74 - 131				
1,1,2,2-Tetrachloroethane	18.42	1.0	20	0	92.1	71 - 121				
1,1,2-Trichloroethane	18.92	1.0	20	0	94.6	80 - 119				
1,1-Dichloroethane	19.04	1.0	20	0	95.2	77 - 125				
1,1-Dichloroethene	17.53	1.0	20	0	87.7	71 - 131				
1,1-Dichloropropene	18.87	1.0	20	0	94.4	78 - 125				
1,2,3-Trichlorobenzene	18.33	1.0	20	0	91.7	69 - 129				
1,2,3-Trichloropropane	19.18	1.0	20	0	95.9	73 - 122				
1,2,4-Trichlorobenzene	19.01	1.0	20	0	95.1	69 - 130				
1,2,4-Trimethylbenzene	19.67	1.0	20	0	98.3	76 - 124				
1,2-Dibromo-3-chloropropane	16.2	1.0	20	0	81.0	62 - 128				
1,2-Dibromoethane	19.34	1.0	20	0	96.7	77 - 121				
1,2-Dichlorobenzene	19.55	1.0	20	0	97.7	80 - 119				
1,2-Dichloroethane	18.84	1.0	20	0	94.2	73 - 128				
1,2-Dichloropropane	20	1.0	20	0	100.0	78 - 122				
1,3,5-Trimethylbenzene	19.62	1.0	20	0	98.1	75 - 124				
1,3-Dichlorobenzene	19.7	1.0	20	0	98.5	80 - 119				
1,3-Dichloropropane	18.94	1.0	20	0	94.7	80 - 119				
1,4-Dichlorobenzene	19.81	1.0	20	0	99.1	79 - 118				
2,2-Dichloropropane	19.02	1.0	20	0	95.1	60 - 139				
2-Butanone	30.6	2.0	40	0	76.5	56 - 143				
2-Chlorotoluene	19.53	1.0	20	0	97.6	79 - 122				
2-Hexanone	34.71	2.0	40	0	86.8	57 - 139				
4-Chlorotoluene	20.06	1.0	20	0	100	78 - 122				
4-Isopropyltoluene	20.12	1.0	20	0	101	77 - 127				
4-Methyl-2-pentanone	35.45	2.0	40	0	88.6	67 - 130				
Acetone	31.52	2.0	40	0	78.8	39 - 160				
Benzene	19.95	1.0	20	0	99.8	79 - 120				
Bromobenzene	19.98	1.0	20	0	99.9	80 - 120				
Bromochloromethane	18.91	1.0	20	0	94.6	78 - 123				
Bromodichloromethane	18.9	1.0	20	0	94.5	79 - 125				
Bromoform	18.51	1.0	20	0	92.5	66 - 130				
Bromomethane	17.76	1.0	20	0	88.8	53 - 141				

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060438

QC BATCH REPORT

Batch ID: R410438 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-220610** Units: **ug/L** Analysis Date: **10-Jun-2022 11:20**
Client ID: Run ID: **VOA6_410438** SeqNo: **6687818** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	36.99	2.0	40	0	92.5	64 - 133				
Carbon tetrachloride	17.51	1.0	20	0	87.6	72 - 136				
Chlorobenzene	20.13	1.0	20	0	101	82 - 118				
Chloroethane	18.67	1.0	20	0	93.3	60 - 138				
Chloroform	18.77	1.0	20	0	93.8	79 - 124				
Chloromethane	19.66	1.0	20	0	98.3	50 - 139				
cis-1,2-Dichloroethene	19.77	1.0	20	0	98.9	78 - 123				
cis-1,3-Dichloropropene	19.52	1.0	20	0	97.6	75 - 124				
Dibromochloromethane	19.08	1.0	20	0	95.4	74 - 126				
Dibromomethane	19.03	1.0	20	0	95.2	79 - 123				
Dichlorodifluoromethane	18.12	1.0	20	0	90.6	32 - 152				
Ethylbenzene	20.13	1.0	20	0	101	79 - 121				
Hexachlorobutadiene	20.94	1.0	20	0	105	66 - 134				
Isopropylbenzene	18.73	1.0	20	0	93.6	72 - 131				
m,p-Xylene	39.52	2.0	40	0	98.8	80 - 121				
Methylene chloride	17.85	2.0	20	0	89.2	74 - 124				
Naphthalene	16.2	1.0	20	0	81.0	61 - 128				
n-Butylbenzene	20.11	1.0	20	0	101	75 - 128				
n-Propylbenzene	19.8	1.0	20	0	99.0	76 - 126				
o-Xylene	20.19	1.0	20	0	101	78 - 122				
sec-Butylbenzene	19.42	1.0	20	0	97.1	77 - 126				
Styrene	20.07	1.0	20	0	100	78 - 123				
tert-Butylbenzene	19.52	1.0	20	0	97.6	78 - 124				
Tetrachloroethene	19.66	1.0	20	0	98.3	74 - 129				
Toluene	20.02	1.0	20	0	100	80 - 121				
trans-1,2-Dichloroethene	19.13	1.0	20	0	95.6	75 - 124				
trans-1,3-Dichloropropene	19.14	1.0	20	0	95.7	73 - 127				
Trichloroethene	19.79	1.0	20	0	98.9	79 - 123				
Trichlorofluoromethane	17.01	1.0	20	0	85.0	65 - 141				
Vinyl chloride	17.72	1.0	20	0	88.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.88*	*1.0*	*50*	*0*	*97.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.96*	*1.0*	*50*	*0*	*99.9*	*85 - 114*				
Surr: Dibromofluoromethane	*48.91*	*1.0*	*50*	*0*	*97.8*	*80 - 119*				
Surr: Toluene-d8	*48.67*	*1.0*	*50*	*0*	*97.3*	*89 - 112*				

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060438

QC BATCH REPORT

Batch ID: R410438 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS22060516-04MS** Units: **ug/L** Analysis Date: **10-Jun-2022 14:50**
Client ID: Run ID: **VOA6_410438** SeqNo: **6687827** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.35	1.0	20	0	102	78 - 124				
1,1,1-Trichloroethane	19.39	1.0	20	0	97.0	74 - 131				
1,1,2,2-Tetrachloroethane	19.66	1.0	20	0	98.3	71 - 121				
1,1,2-Trichloroethane	19.31	1.0	20	0	96.6	80 - 119				
1,1-Dichloroethane	19.44	1.0	20	0	97.2	77 - 125				
1,1-Dichloroethene	18.69	1.0	20	0	93.4	71 - 131				
1,1-Dichloropropene	20.69	1.0	20	0	103	78 - 125				
1,2,3-Trichlorobenzene	19.35	1.0	20	0	96.8	69 - 129				
1,2,3-Trichloropropane	19	1.0	20	0	95.0	73 - 122				
1,2,4-Trichlorobenzene	19.85	1.0	20	0	99.3	69 - 130				
1,2,4-Trimethylbenzene	21.4	1.0	20	0	107	76 - 124				
1,2-Dibromo-3-chloropropane	15.72	1.0	20	0	78.6	62 - 128				
1,2-Dibromoethane	19.75	1.0	20	0	98.7	77 - 121				
1,2-Dichlorobenzene	20.76	1.0	20	0	104	80 - 119				
1,2-Dichloroethane	19.64	1.0	20	0	98.2	73 - 128				
1,2-Dichloropropane	19.88	1.0	20	0	99.4	78 - 122				
1,3,5-Trimethylbenzene	21.49	1.0	20	0	107	75 - 124				
1,3-Dichlorobenzene	20.88	1.0	20	0	104	80 - 119				
1,3-Dichloropropane	19.73	1.0	20	0	98.7	80 - 119				
1,4-Dichlorobenzene	21.2	1.0	20	0	106	79 - 118				
2,2-Dichloropropane	19.69	1.0	20	0	98.4	60 - 139				
2-Butanone	31.23	2.0	40	0	78.1	56 - 143				
2-Chlorotoluene	20.8	1.0	20	0	104	79 - 122				
2-Hexanone	37.7	2.0	40	0	94.3	57 - 139				
4-Chlorotoluene	21.24	1.0	20	0	106	78 - 122				
4-Isopropyltoluene	22.72	1.0	20	0	114	77 - 127				
4-Methyl-2-pentanone	38.89	2.0	40	0	97.2	67 - 130				
Acetone	25.32	2.0	40	0	63.3	39 - 160				
Benzene	20.23	1.0	20	0	101	79 - 120				
Bromobenzene	21.45	1.0	20	0	107	80 - 120				
Bromochloromethane	18.89	1.0	20	0	94.5	78 - 123				
Bromodichloromethane	18.78	1.0	20	0	93.9	79 - 125				
Bromoform	18.95	1.0	20	0	94.8	66 - 130				
Bromomethane	14.44	1.0	20	0	72.2	53 - 141				

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060438

QC BATCH REPORT

Batch ID: R410438 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS22060516-04MS** Units: **ug/L** Analysis Date: **10-Jun-2022 14:50**
Client ID: Run ID: **VOA6_410438** SeqNo: **6687827** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	39.18	2.0	40	0	98.0	64 - 133				
Carbon tetrachloride	19.81	1.0	20	0	99.1	72 - 136				
Chlorobenzene	21.01	1.0	20	0	105	82 - 118				
Chloroethane	17.15	1.0	20	0	85.7	60 - 138				
Chloroform	18.74	1.0	20	0	93.7	79 - 124				
Chloromethane	18.8	1.0	20	0	94.0	50 - 139				
cis-1,2-Dichloroethene	19.66	1.0	20	0	98.3	78 - 123				
cis-1,3-Dichloropropene	19.02	1.0	20	0	95.1	75 - 124				
Dibromochloromethane	19.43	1.0	20	0	97.2	74 - 126				
Dibromomethane	18.87	1.0	20	0	94.4	79 - 123				
Dichlorodifluoromethane	13.18	1.0	20	0	65.9	32 - 152				
Ethylbenzene	21.31	1.0	20	0	107	79 - 121				
Hexachlorobutadiene	23.11	1.0	20	0	116	66 - 134				
Isopropylbenzene	20.93	1.0	20	0	105	72 - 131				
m,p-Xylene	43.02	2.0	40	0	108	80 - 121				
Methylene chloride	17.58	2.0	20	0	87.9	74 - 124				
Naphthalene	17.45	1.0	20	0	87.2	61 - 128				
n-Butylbenzene	24.61	1.0	20	1.681	115	75 - 128				
n-Propylbenzene	22.81	1.0	20	0.5623	111	76 - 126				
o-Xylene	21.3	1.0	20	0	106	78 - 122				
sec-Butylbenzene	24.07	1.0	20	1.456	113	77 - 126				
Styrene	20.98	1.0	20	0	105	78 - 123				
tert-Butylbenzene	22.38	1.0	20	0	112	78 - 124				
Tetrachloroethene	23.06	1.0	20	0	115	74 - 129				
Toluene	21.37	1.0	20	0	107	80 - 121				
trans-1,2-Dichloroethene	20.08	1.0	20	0	100	75 - 124				
trans-1,3-Dichloropropene	18.59	1.0	20	0	93.0	73 - 127				
Trichloroethene	20.6	1.0	20	0	103	79 - 123				
Trichlorofluoromethane	18.69	1.0	20	0	93.4	65 - 141				
Vinyl chloride	17.44	1.0	20	0	87.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.44*	*1.0*	*50*	*0*	*92.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.2*	*1.0*	*50*	*0*	*98.4*	*85 - 114*				
Surr: Dibromofluoromethane	*47.12*	*1.0*	*50*	*0*	*94.2*	*80 - 119*				
Surr: Toluene-d8	*49.92*	*1.0*	*50*	*0*	*99.8*	*89 - 112*				

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060438

QC BATCH REPORT

Batch ID: R410438 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22060516-04MSD** Units: **ug/L** Analysis Date: **10-Jun-2022 15:11**
Client ID: Run ID: **VOA6_410438** SeqNo: **6687828** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.38	1.0	20	0	96.9	78 - 124	20.35	4.86	20	
1,1,1-Trichloroethane	18.37	1.0	20	0	91.8	74 - 131	19.39	5.42	20	
1,1,2,2-Tetrachloroethane	19.65	1.0	20	0	98.3	71 - 121	19.66	0.0256	20	
1,1,2-Trichloroethane	18.56	1.0	20	0	92.8	80 - 119	19.31	3.96	20	
1,1-Dichloroethane	18.86	1.0	20	0	94.3	77 - 125	19.44	3.07	20	
1,1-Dichloroethene	17.66	1.0	20	0	88.3	71 - 131	18.69	5.65	20	
1,1-Dichloropropene	19.64	1.0	20	0	98.2	78 - 125	20.69	5.21	20	
1,2,3-Trichlorobenzene	21.2	1.0	20	0	106	69 - 129	19.35	9.12	20	
1,2,3-Trichloropropane	18.65	1.0	20	0	93.2	73 - 122	19	1.88	20	
1,2,4-Trichlorobenzene	20.69	1.0	20	0	103	69 - 130	19.85	4.15	20	
1,2,4-Trimethylbenzene	20.48	1.0	20	0	102	76 - 124	21.4	4.41	20	
1,2-Dibromo-3-chloropropane	17.31	1.0	20	0	86.5	62 - 128	15.72	9.59	20	
1,2-Dibromoethane	19.1	1.0	20	0	95.5	77 - 121	19.75	3.36	20	
1,2-Dichlorobenzene	20.32	1.0	20	0	102	80 - 119	20.76	2.16	20	
1,2-Dichloroethane	18.55	1.0	20	0	92.7	73 - 128	19.64	5.75	20	
1,2-Dichloropropane	19.09	1.0	20	0	95.4	78 - 122	19.88	4.08	20	
1,3,5-Trimethylbenzene	20.52	1.0	20	0	103	75 - 124	21.49	4.63	20	
1,3-Dichlorobenzene	20.15	1.0	20	0	101	80 - 119	20.88	3.56	20	
1,3-Dichloropropane	19.36	1.0	20	0	96.8	80 - 119	19.73	1.9	20	
1,4-Dichlorobenzene	20.4	1.0	20	0	102	79 - 118	21.2	3.86	20	
2,2-Dichloropropane	18.66	1.0	20	0	93.3	60 - 139	19.69	5.33	20	
2-Butanone	33.61	2.0	40	0	84.0	56 - 143	31.23	7.35	20	
2-Chlorotoluene	19.76	1.0	20	0	98.8	79 - 122	20.8	5.12	20	
2-Hexanone	37.49	2.0	40	0	93.7	57 - 139	37.7	0.566	20	
4-Chlorotoluene	20.44	1.0	20	0	102	78 - 122	21.24	3.84	20	
4-Isopropyltoluene	21.67	1.0	20	0	108	77 - 127	22.72	4.72	20	
4-Methyl-2-pentanone	38.13	2.0	40	0	95.3	67 - 130	38.89	1.99	20	
Acetone	25.21	2.0	40	0	63.0	39 - 160	25.32	0.438	20	
Benzene	19.42	1.0	20	0	97.1	79 - 120	20.23	4.1	20	
Bromobenzene	20.38	1.0	20	0	102	80 - 120	21.45	5.11	20	
Bromochloromethane	18.07	1.0	20	0	90.4	78 - 123	18.89	4.43	20	
Bromodichloromethane	18.28	1.0	20	0	91.4	79 - 125	18.78	2.69	20	
Bromoform	18.37	1.0	20	0	91.9	66 - 130	18.95	3.09	20	
Bromomethane	13.63	1.0	20	0	68.1	53 - 141	14.44	5.82	20	

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060438

QC BATCH REPORT

Batch ID: R410438 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS22060516-04MSD** Units: **ug/L** Analysis Date: **10-Jun-2022 15:11**
Client ID: Run ID: **VOA6_410438** SeqNo: **6687828** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	36.9	2.0	40	0	92.3	64 - 133	39.18	5.99	20	
Carbon tetrachloride	18.9	1.0	20	0	94.5	72 - 136	19.81	4.7	20	
Chlorobenzene	19.68	1.0	20	0	98.4	82 - 118	21.01	6.53	20	
Chloroethane	17.07	1.0	20	0	85.4	60 - 138	17.15	0.451	20	
Chloroform	18.13	1.0	20	0	90.6	79 - 124	18.74	3.35	20	
Chloromethane	16.99	1.0	20	0	84.9	50 - 139	18.8	10.1	20	
cis-1,2-Dichloroethene	18.98	1.0	20	0	94.9	78 - 123	19.66	3.56	20	
cis-1,3-Dichloropropene	18.83	1.0	20	0	94.1	75 - 124	19.02	0.999	20	
Dibromochloromethane	18.89	1.0	20	0	94.5	74 - 126	19.43	2.84	20	
Dibromomethane	18.52	1.0	20	0	92.6	79 - 123	18.87	1.88	20	
Dichlorodifluoromethane	12.43	1.0	20	0	62.1	32 - 152	13.18	5.84	20	
Ethylbenzene	20.19	1.0	20	0	101	79 - 121	21.31	5.42	20	
Hexachlorobutadiene	22.4	1.0	20	0	112	66 - 134	23.11	3.11	20	
Isopropylbenzene	19.88	1.0	20	0	99.4	72 - 131	20.93	5.15	20	
m,p-Xylene	40.21	2.0	40	0	101	80 - 121	43.02	6.75	20	
Methylene chloride	17.05	2.0	20	0	85.3	74 - 124	17.58	3.08	20	
Naphthalene	20.55	1.0	20	0	103	61 - 128	17.45	16.3	20	
n-Butylbenzene	23.43	1.0	20	1.681	109	75 - 128	24.61	4.91	20	
n-Propylbenzene	21.71	1.0	20	0.5623	106	76 - 126	22.81	4.97	20	
o-Xylene	20.02	1.0	20	0	100	78 - 122	21.3	6.2	20	
sec-Butylbenzene	22.76	1.0	20	1.456	107	77 - 126	24.07	5.57	20	
Styrene	19.75	1.0	20	0	98.8	78 - 123	20.98	6.03	20	
tert-Butylbenzene	21.48	1.0	20	0	107	78 - 124	22.38	4.12	20	
Tetrachloroethene	20.66	1.0	20	0	103	74 - 129	23.06	11	20	
Toluene	19.86	1.0	20	0	99.3	80 - 121	21.37	7.32	20	
trans-1,2-Dichloroethene	18.96	1.0	20	0	94.8	75 - 124	20.08	5.73	20	
trans-1,3-Dichloropropene	18.39	1.0	20	0	92.0	73 - 127	18.59	1.08	20	
Trichloroethene	19.26	1.0	20	0	96.3	79 - 123	20.6	6.73	20	
Trichlorofluoromethane	17.62	1.0	20	0	88.1	65 - 141	18.69	5.87	20	
Vinyl chloride	16.43	1.0	20	0	82.1	58 - 137	17.44	5.95	20	
Surr: 1,2-Dichloroethane-d4	*44.57*	*1.0*	*50*	*0*	*89.1*	*81 - 118*	*46.44*	*4.12*	*20*	
Surr: 4-Bromofluorobenzene	*49.03*	*1.0*	*50*	*0*	*98.1*	*85 - 114*	*49.2*	*0.345*	*20*	
Surr: Dibromofluoromethane	*46.64*	*1.0*	*50*	*0*	*93.3*	*80 - 119*	*47.12*	*1.04*	*20*	
Surr: Toluene-d8	*49.4*	*1.0*	*50*	*0*	*98.8*	*89 - 112*	*49.92*	*1.04*	*20*	

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060438

QC BATCH REPORT

Batch ID: R410438 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:

HS22060438-01	HS22060438-02	HS22060438-05	HS22060438-06
HS22060438-07	HS22060438-08	HS22060438-11	HS22060438-12

ALS Houston, US Date: 21-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: **HS22060438**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

ALS Houston, US Date: 21-Jun-22

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Dept of Defense	L21-682	31-Dec-2023
Florida	E87611-34	30-Jun-2022
Illinois	2000322022-9	09-May-2023
Kansas	E-10352 2021-2022	31-Jul-2022
Louisiana	03087, 2021-2022	30-Jun-2022
Maryland	343, 2022-2023	30-Jun-2023
North Carolina	624-2022	31-Dec-2022
Oklahoma	2021-080	31-Aug-2022
Texas	T104704231-22-29	30-Apr-2023
Utah	TX026932021-12	30-Jul-2022

ALS Houston, US Date: 21-Jun-22

Sample Receipt Checklist

Work Order ID: HS22060438 **Date/Time Received:** **08-Jun-2022 10:00**

Client Name: Bhate Environmental **Received by:** **Paresh M. Giga**

Completed By:	/S/ Nilesh D. Ranchod	09-Jun-2022 10:40	**Reviewed by:**	/S/ Ragen Giga	21-Jun-2022 13:21
	eSignature	Date/Time		eSignature	Date/Time

Matrices: **W** Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:Client
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.7C/2.2C UC/C	IR #31
Cooler(s)/Kit(s):	48830	
Date/Time sample(s) sent to storage:	06/08/2022;18:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

01154603

bhate

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 58

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	MEE	TOC	Carbon Dioxide	Anions	Arsenic	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
03WW01_060622	06 JUN 2022	0735	-	N		WG	4	X					X				
35AWW08_060622	06 JUN 2022	0815	-	N		WG	4	X					X				
35AWW01_060622	06 JUN 2022	0900	-	N		WG	4	X					X				
35AWW01_060622_a	06 JUN 2022	0900		FD		WG	4	X					X				
35AWW09_060622	06 JUN 2022	0945		N		WG	4	X					X				
35AWW13_060622	06 JUN 2022	1035	-	N		WG	3	X									
35AWW10_060622	06 JUN 2022	1115	-	N		WG	3	X									
35AWW22_060622	06 JUN 2022	1200	-	N		WG	3	X									
35AWW12_060622	06 JUN 2022	1245	-	N		WG	3	X									
35AWW12_060622_a	06 JUN 2022	1245	-	FD		WG	3	X									
35AWW14_060622	06 JUN 2022	1300	-	N		WG	3	X									

Sample Analysis Requested (5) | Quality Assurance Samples (6)

COMMENTS: STANDARD TAT

U8330 1.7

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
Scott Beesinger	6/7/22	1400	1.	6/8/22	10:50
2.			2.		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: ____ Shipped

Method of Shipment: ____

Fed Ex ____ Airbill

Analytical Lab: ALS 10450 Stanciff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: Dane Wagasey Lab Recipient:

Delivery Date/Time:

No.:

Number:

HS2206438

Bhate Environmental Associates, Inc.
LHAAP / Site 58

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

01154604

bhate ENVIRONMENTAL CORPORATION

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 58

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	MEE	TOC	Carbon Dioxide	Anions	Arsenic					Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
							Sample Analysis Requested (5)											Quality Assurance Samples (6)			
TRIP BLANK	06JUN2022		-	TB		W	2	X													
			-																		
			-																		
			-																		
			-																		
			-																		
			-																		
			-																		
			-																		

COMMENTS: STANDARD TAT

HS2206438

Bhate Environmental Associates, Inc.
LHAAP / Site 58

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	6/7/22	1400	1.	6/8/22	0950
2.			2.		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: ____ Shipped

Method of Shipment: ____

____ Fed Ex ____ Airbill

Analytical Lab: ALS 10450 Stanclift Rd, Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: Dane Wacasey Lab Recipient:

Delivery Date/Time:

No.:

Number:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

48830

CUSTODY SEAL

Date: 6/7/22 Time: 1400
Name: Shawn Beesinger
Company: BHATE

Seal Broken By: DM
Date: 06/08/22

48830 JUN 0 8 2022



48830

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 25MAY22
ACTWGT: 1.00 LB MAN
CAD: 0221247/CAFE3512
DIMS: 26x14x14 IN

TO SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON TX 77099
(281) 530-5668
REF: LHAAP-56-BO 85517-DW
RMA:

FedEx Express

PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

3973207 07Jun2022 SGGA 560G2/274F/C0B8

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

June 30, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22060453**

Laboratory Results for: **LHAAP-58**

Dear Marcia Olive,

ALS Environmental received 9 sample(s) on Jun 09, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,



Generated By: DANE.WACASEY
Dane J. Wacasey

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS22060453

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS22060453-01	35AWW19_060822	Groundwater		08-Jun-2022 07:15	09-Jun-2022 09:45	☐
HS22060453-02	35AWW23_060822	Groundwater		08-Jun-2022 08:05	09-Jun-2022 09:45	☐
HS22060453-03	35AWW06_060822	Groundwater		08-Jun-2022 09:00	09-Jun-2022 09:45	☐
HS22060453-04	LHSMW07_060822	Groundwater		08-Jun-2022 09:50	09-Jun-2022 09:45	☐
HS22060453-05	35AWW20_060822	Groundwater		08-Jun-2022 10:45	09-Jun-2022 09:45	☐
HS22060453-06	35AWW11_060822	Groundwater		08-Jun-2022 11:40	09-Jun-2022 09:45	☐
HS22060453-07	35AWW24_060822	Groundwater		08-Jun-2022 12:35	09-Jun-2022 09:45	☐
HS22060453-08	35AWW24_060822_a	Groundwater		08-Jun-2022 12:35	09-Jun-2022 09:45	☐
HS22060453-09	Trip Blank	Water		08-Jun-2022 00:00	09-Jun-2022 09:45	☐

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP-58
Work Order: HS22060453

Work Order Comments

- The analysis of CO2 by method RSK-175 was performed by Pace Laboratory, Baton Rouge, Louisiana. The final report is appended.

The analysis of CENSUS DNA DHC was performed by Microbial Insights, Inc., Knoxville, Tennessee. The final report is appended.

GC Semivolatiles by Method RSK-175

Batch ID: R411175

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R410438,R410539

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020A

Batch ID: 180277

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Subcontracted by Method NA

Batch ID: R411757,R411980

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E415.1

Batch ID: R411032,R411152

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: R410358

Sample ID: 35AWW06_060822 (HS22060453-03)

- The reporting limit(s) is/are elevated due to dilution for high concentrations of chloride and or sulfate.

Sample ID: 35AWW11_060822 (HS22060453-06)

- The reporting limit(s) is/are elevated due to dilution for high concentrations of chloride and or sulfate.

Sample ID: 35AWW19_060822 (HS22060453-01MS)

- The MS and/or MSD recovery was outside of the control limits; however, the result in the parent sample is greater than 4x the spike amount. (Chloride)

Sample ID: 35AWW23_060822 (HS22060453-02)

- The reporting limit(s) is/are elevated due to dilution for high concentrations of chloride and or sulfate.

Sample ID: LHSMW07_060822 (HS22060453-04)

- The reporting limit(s) is/are elevated due to dilution for high concentrations of chloride and or sulfate.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW19_060822
Collection Date: 08-Jun-2022 07:15

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:00
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 18:00
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
1,1-Dichloroethane	**0.63**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Jun-2022 18:00
1,1-Dichloroethene	**2.9**		**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Jun-2022 18:00
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:00
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 18:00
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 18:00
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	10-Jun-2022 18:00
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:00
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 18:00
1,2-Dichloroethane	**0.98**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Jun-2022 18:00
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 18:00
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:00
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:00
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:00
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 18:00
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	10-Jun-2022 18:00
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:00
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	10-Jun-2022 18:00
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 18:00
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:00
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:00
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:00
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:00
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:00
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:00
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	10-Jun-2022 18:00
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 18:00
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW19_060822
Collection Date: 08-Jun-2022 07:15

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:00
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:00
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:00
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:00
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	10-Jun-2022 18:00
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 18:00
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 18:00
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:00
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:00
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:00
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:00
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:00
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:00
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:00
Surr: 1,2-Dichloroethane-d4	*91.5*			**0**	*81-118*	*%REC*	*1*	*10-Jun-2022 18:00*
Surr: 4-Bromofluorobenzene	*92.1*			**0**	*85-114*	*%REC*	*1*	*10-Jun-2022 18:00*
Surr: Dibromofluoromethane	*94.1*			**0**	*80-119*	*%REC*	*1*	*10-Jun-2022 18:00*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*10-Jun-2022 18:00*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	**2.34**		**0.144**	**0.250**	**1.00**	**ug/L**	1	17-Jun-2022 12:13
Ethene	0.500	U	0.234	0.500	1.00	ug/L	1	17-Jun-2022 12:13
Methane	**2.91**		**0.107**	**0.250**	**0.500**	**ug/L**	1	17-Jun-2022 12:13
TOTAL ORGANIC CARBON BY E415.1		**Method:E415.1**						Analyst: SB
Organic Carbon, Total	**2.43**		**0.500**	**1.00**	**1.00**	**mg/L**	1	18-Jun-2022 01:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW19_060822
Collection Date: 08-Jun-2022 07:15

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: TH
Chloride	**529**		**4.00**	**10.0**	**10.0**	**mg/L**	20	09-Jun-2022 16:08
Nitrogen, Nitrate (As N)	**0.0352**	J	**0.0300**	**0.100**	**0.100**	**mg/L**	1	09-Jun-2022 15:52
Nitrogen, Nitrite (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	09-Jun-2022 15:52
Sulfate	**675**		**4.00**	**10.0**	**10.0**	**mg/L**	20	09-Jun-2022 16:08
SUBCONTRACT ANALYSIS - CO2		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Jun-2022 10:19
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See attached		0	0	0	NA	1	10-Jun-2022 12:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW23_060822
Collection Date: 08-Jun-2022 08:05

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:21
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 18:21
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:21
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:21
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:21
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 18:21
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 18:21
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	10-Jun-2022 18:21
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:21
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 18:21
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:21
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 18:21
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:21
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:21
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:21
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 18:21
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	10-Jun-2022 18:21
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:21
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	10-Jun-2022 18:21
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 18:21
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:21
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:21
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:21
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:21
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:21
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:21
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	10-Jun-2022 18:21
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 18:21
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW23_060822
Collection Date: 08-Jun-2022 08:05

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:21
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:21
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:21
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:21
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	10-Jun-2022 18:21
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 18:21
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 18:21
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:21
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
Toluene	**1.4**		**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Jun-2022 18:21
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:21
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:21
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:21
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:21
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:21
Surr: 1,2-Dichloroethane-d4	*92.1*			**0**	*81-118*	*%REC*	*1*	*10-Jun-2022 18:21*
Surr: 4-Bromofluorobenzene	*95.0*			**0**	*85-114*	*%REC*	*1*	*10-Jun-2022 18:21*
Surr: Dibromofluoromethane	*94.1*			**0**	*80-119*	*%REC*	*1*	*10-Jun-2022 18:21*
Surr: Toluene-d8	*99.0*			**0**	*89-112*	*%REC*	*1*	*10-Jun-2022 18:21*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.250	U	0.144	0.250	1.00	ug/L	1	17-Jun-2022 12:41
Ethene	0.500	U	0.234	0.500	1.00	ug/L	1	17-Jun-2022 12:41
Methane	**3,170**		**10.7**	**25.0**	**50.0**	**ug/L**	100	17-Jun-2022 13:57
TOTAL ORGANIC CARBON BY E415.1		**Method:E415.1**						Analyst: SB
Organic Carbon, Total	**14.2**		**0.500**	**1.00**	**1.00**	**mg/L**	1	18-Jun-2022 01:25

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW23_060822
Collection Date: 08-Jun-2022 08:05

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: TH
Chloride	**807**		**4.00**	**10.0**	**10.0**	**mg/L**	20	09-Jun-2022 16:19
Nitrogen, Nitrate (As N)	**0.0720**	J	**0.0600**	**0.200**	**0.200**	**mg/L**	2	09-Jun-2022 16:14
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	09-Jun-2022 16:14
Sulfate	**1.47**		**0.400**	**1.00**	**1.00**	**mg/L**	2	09-Jun-2022 16:14
SUBCONTRACT ANALYSIS - CO2		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Jun-2022 10:19
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See attached		0	0	0	NA	1	10-Jun-2022 12:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW06_060822
Collection Date: 08-Jun-2022 09:00

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:42
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 18:42
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:42
1,1-Dichloroethene	**1.00**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Jun-2022 18:42
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:42
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 18:42
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 18:42
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	10-Jun-2022 18:42
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:42
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 18:42
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:42
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 18:42
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:42
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:42
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:42
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 18:42
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	10-Jun-2022 18:42
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:42
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	10-Jun-2022 18:42
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 18:42
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:42
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:42
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:42
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:42
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:42
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:42
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	10-Jun-2022 18:42
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 18:42
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW06_060822
Collection Date: 08-Jun-2022 09:00

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:42
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:42
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:42
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:42
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	10-Jun-2022 18:42
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 18:42
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 18:42
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 18:42
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:42
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:42
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:42
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:42
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 18:42
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 18:42
Surr: 1,2-Dichloroethane-d4	*90.4*			**0**	*81-118*	*%REC*	*1*	*10-Jun-2022 18:42*
Surr: 4-Bromofluorobenzene	*93.2*			**0**	*85-114*	*%REC*	*1*	*10-Jun-2022 18:42*
Surr: Dibromofluoromethane	*92.4*			**0**	*80-119*	*%REC*	*1*	*10-Jun-2022 18:42*
Surr: Toluene-d8	*99.6*			**0**	*89-112*	*%REC*	*1*	*10-Jun-2022 18:42*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.250	U	0.144	0.250	1.00	ug/L	1	17-Jun-2022 12:54
Ethene	0.500	U	0.234	0.500	1.00	ug/L	1	17-Jun-2022 12:54
Methane	**2,740**		**10.7**	**25.0**	**50.0**	**ug/L**	100	17-Jun-2022 14:10
TOTAL ORGANIC CARBON BY E415.1		**Method:E415.1**						Analyst: SB
Organic Carbon, Total	**10.6**		**0.500**	**1.00**	**1.00**	**mg/L**	1	18-Jun-2022 01:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW06_060822
Collection Date: 08-Jun-2022 09:00

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: TH
Chloride	**938**		**4.00**	**10.0**	**10.0**	**mg/L**	20	09-Jun-2022 16:30
Nitrogen, Nitrate (As N)	**0.0666**	J	**0.0600**	**0.200**	**0.200**	**mg/L**	2	09-Jun-2022 16:24
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	09-Jun-2022 16:24
Sulfate	**457**		**4.00**	**10.0**	**10.0**	**mg/L**	20	09-Jun-2022 16:30
SUBCONTRACT ANALYSIS - CO2		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Jun-2022 10:19
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See attached		0	0	0	NA	1	10-Jun-2022 12:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: LHSMW07_060822
Collection Date: 08-Jun-2022 09:50

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:03
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 19:03
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
1,1-Dichloroethane	**9.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Jun-2022 19:03
1,1-Dichloroethene	**8.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Jun-2022 19:03
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:03
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 19:03
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 19:03
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	10-Jun-2022 19:03
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:03
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 19:03
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:03
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 19:03
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:03
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:03
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:03
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 19:03
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	10-Jun-2022 19:03
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:03
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	10-Jun-2022 19:03
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 19:03
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:03
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:03
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:03
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:03
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:03
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:03
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	10-Jun-2022 19:03
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 19:03
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: LHSMW07_060822
Collection Date: 08-Jun-2022 09:50

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:03
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:03
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:03
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:03
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	10-Jun-2022 19:03
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 19:03
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 19:03
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:03
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:03
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:03
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:03
Trichloroethene	**0.71**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Jun-2022 19:03
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:03
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:03
Surr: 1,2-Dichloroethane-d4	*94.0*			**0**	*81-118*	*%REC*	*1*	*10-Jun-2022 19:03*
Surr: 4-Bromofluorobenzene	*96.4*			**0**	*85-114*	*%REC*	*1*	*10-Jun-2022 19:03*
Surr: Dibromofluoromethane	*95.7*			**0**	*80-119*	*%REC*	*1*	*10-Jun-2022 19:03*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*10-Jun-2022 19:03*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.250	U	0.144	0.250	1.00	ug/L	1	17-Jun-2022 13:05
Ethene	**38.9**		**0.234**	**0.500**	**1.00**	**ug/L**	1	17-Jun-2022 13:05
Methane	**1,950**		**10.7**	**25.0**	**50.0**	**ug/L**	100	17-Jun-2022 14:51
TOTAL ORGANIC CARBON BY E415.1		**Method:E415.1**						Analyst: SB
Organic Carbon, Total	**6.23**		**0.500**	**1.00**	**1.00**	**mg/L**	1	21-Jun-2022 03:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: LHSMW07_060822
Collection Date: 08-Jun-2022 09:50

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: TH
Chloride	**1,960**		**10.0**	**25.0**	**25.0**	**mg/L**	50	09-Jun-2022 17:07
Nitrogen, Nitrate (As N)	**0.262**	J	**0.150**	**0.500**	**0.500**	**mg/L**	5	09-Jun-2022 17:01
Nitrogen, Nitrite (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	09-Jun-2022 17:01
Sulfate	**2,970**		**10.0**	**25.0**	**25.0**	**mg/L**	50	09-Jun-2022 17:07
SUBCONTRACT ANALYSIS - CO2		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Jun-2022 10:19
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See attached		0	0	0	NA	1	10-Jun-2022 12:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW20_060822
Collection Date: 08-Jun-2022 10:45

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
1,1,1-Trichloroethane	2.5	U	1.0	2.5	5.0	ug/L	5	13-Jun-2022 14:23
1,1,2,2-Tetrachloroethane	5.0	U	2.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
1,1,2-Trichloroethane	**62**		**1.5**	**5.0**	**5.0**	**ug/L**	5	13-Jun-2022 14:23
1,1-Dichloroethane	**520**		**1.0**	**2.5**	**5.0**	**ug/L**	5	13-Jun-2022 14:23
1,1-Dichloroethene	**1,600**		**10**	**25**	**50**	**ug/L**	50	13-Jun-2022 16:09
1,1-Dichloropropene	5.0	U	1.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
1,2,3-Trichlorobenzene	5.0	U	2.0	5.0	5.0	ug/L	5	13-Jun-2022 14:23
1,2,3-Trichloropropane	5.0	U	2.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
1,2,4-Trichlorobenzene	5.0	U	2.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
1,2,4-Trimethylbenzene	5.0	U	1.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
1,2-Dibromo-3-chloropropane	5.0	U	1.0	5.0	5.0	ug/L	5	13-Jun-2022 14:23
1,2-Dibromoethane	2.5	U	1.0	2.5	5.0	ug/L	5	13-Jun-2022 14:23
1,2-Dichlorobenzene	**27**		**2.5**	**5.0**	**5.0**	**ug/L**	5	13-Jun-2022 14:23
1,2-Dichloroethane	**13**		**1.0**	**2.5**	**5.0**	**ug/L**	5	13-Jun-2022 14:23
1,2-Dichloropropane	5.0	U	2.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
1,3,5-Trimethylbenzene	5.0	U	1.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
1,3-Dichlorobenzene	5.0	U	2.0	5.0	5.0	ug/L	5	13-Jun-2022 14:23
1,3-Dichloropropane	5.0	U	1.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
1,4-Dichlorobenzene	5.0	U	2.0	5.0	5.0	ug/L	5	13-Jun-2022 14:23
2,2-Dichloropropane	2.5	U	1.0	2.5	5.0	ug/L	5	13-Jun-2022 14:23
2-Butanone	5.0	U	2.5	5.0	10	ug/L	5	13-Jun-2022 14:23
2-Chlorotoluene	5.0	U	1.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
2-Hexanone	10	U	5.0	10	10	ug/L	5	13-Jun-2022 14:23
4-Chlorotoluene	5.0	U	2.0	5.0	5.0	ug/L	5	13-Jun-2022 14:23
4-Isopropyltoluene	5.0	U	1.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
4-Methyl-2-pentanone	10	U	3.5	10	10	ug/L	5	13-Jun-2022 14:23
Acetone	10	U	2.0	10	10	ug/L	5	13-Jun-2022 14:23
Benzene	**7.2**		**1.0**	**2.5**	**5.0**	**ug/L**	5	13-Jun-2022 14:23
Bromobenzene	5.0	U	2.0	5.0	5.0	ug/L	5	13-Jun-2022 14:23
Bromochloromethane	2.5	U	1.0	2.5	5.0	ug/L	5	13-Jun-2022 14:23
Bromodichloromethane	2.5	U	1.0	2.5	5.0	ug/L	5	13-Jun-2022 14:23
Bromoform	5.0	U	2.0	5.0	5.0	ug/L	5	13-Jun-2022 14:23
Bromomethane	5.0	U	2.0	5.0	5.0	ug/L	5	13-Jun-2022 14:23
Carbon disulfide	10	U	3.0	10	10	ug/L	5	13-Jun-2022 14:23
Carbon tetrachloride	5.0	U	2.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
Chlorobenzene	5.0	U	1.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
Chloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
Chloroform	2.5	U	1.0	2.5	5.0	ug/L	5	13-Jun-2022 14:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW20_060822
Collection Date: 08-Jun-2022 10:45

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	2.5	U	1.0	2.5	5.0	ug/L	5	13-Jun-2022 14:23
cis-1,2-Dichloroethene	**89**		**1.0**	**2.5**	**5.0**	**ug/L**	5	13-Jun-2022 14:23
cis-1,3-Dichloropropene	2.5	U	1.0	2.5	5.0	ug/L	5	13-Jun-2022 14:23
Dibromochloromethane	5.0	U	1.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
Dibromomethane	2.5	U	1.0	2.5	5.0	ug/L	5	13-Jun-2022 14:23
Dichlorodifluoromethane	5.0	U	1.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
Ethylbenzene	5.0	U	1.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
Hexachlorobutadiene	5.0	U	5.0	5.0	5.0	ug/L	5	13-Jun-2022 14:23
Isopropylbenzene	5.0	U	1.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
m,p-Xylene	5.0	U	2.5	5.0	10	ug/L	5	13-Jun-2022 14:23
Methylene chloride	10	U	2.0	10	10	ug/L	5	13-Jun-2022 14:23
n-Butylbenzene	5.0	U	2.0	5.0	5.0	ug/L	5	13-Jun-2022 14:23
n-Propylbenzene	5.0	U	1.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
Naphthalene	5.0	U	1.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
o-Xylene	5.0	U	1.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
sec-Butylbenzene	5.0	U	1.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
Styrene	5.0	U	1.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
tert-Butylbenzene	5.0	U	1.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
Tetrachloroethene	5.0	U	1.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
Toluene	2.5	U	1.0	2.5	5.0	ug/L	5	13-Jun-2022 14:23
trans-1,2-Dichloroethene	**6.4**		**1.0**	**2.5**	**5.0**	**ug/L**	5	13-Jun-2022 14:23
trans-1,3-Dichloropropene	2.5	U	1.0	2.5	5.0	ug/L	5	13-Jun-2022 14:23
Trichloroethene	**150**		**1.0**	**2.5**	**5.0**	**ug/L**	5	13-Jun-2022 14:23
Trichlorofluoromethane	5.0	U	1.5	5.0	5.0	ug/L	5	13-Jun-2022 14:23
Vinyl chloride	**840**		**1.0**	**2.5**	**5.0**	**ug/L**	5	13-Jun-2022 14:23
Surr: 1,2-Dichloroethane-d4	*91.2*			**0**	*81-118*	*%REC*	*5*	*13-Jun-2022 14:23*
Surr: 1,2-Dichloroethane-d4	*90.4*			**0**	*81-118*	*%REC*	*50*	*13-Jun-2022 16:09*
Surr: 4-Bromofluorobenzene	*94.1*			**0**	*85-114*	*%REC*	*5*	*13-Jun-2022 14:23*
Surr: 4-Bromofluorobenzene	*92.4*			**0**	*85-114*	*%REC*	*50*	*13-Jun-2022 16:09*
Surr: Dibromofluoromethane	*94.0*			**0**	*80-119*	*%REC*	*5*	*13-Jun-2022 14:23*
Surr: Dibromofluoromethane	*93.4*			**0**	*80-119*	*%REC*	*50*	*13-Jun-2022 16:09*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*5*	*13-Jun-2022 14:23*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*50*	*13-Jun-2022 16:09*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.250	U	0.144	0.250	1.00	ug/L	1	17-Jun-2022 13:20
Ethene	**16.1**		**0.234**	**0.500**	**1.00**	**ug/L**	1	17-Jun-2022 13:20
Methane	**714**		**10.7**	**25.0**	**50.0**	**ug/L**	100	17-Jun-2022 15:04
METALS BY ICPMS BY SW6020A		**Method:SW6020A**				Prep:SW3010A / 22-Jun-2022		Analyst: JHD
Arsenic	**0.00221**	J	**0.000400**	**0.00125**	**0.00500**	**mg/L**	1	22-Jun-2022 21:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW20_060822
Collection Date: 08-Jun-2022 10:45

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON BY E415.1		**Method:E415.1**						Analyst: SB
Organic Carbon, Total	**17.7**		**0.500**	**1.00**	**1.00**	**mg/L**	1	21-Jun-2022 03:25
ANIONS BY SW9056A		**Method:SW9056**						Analyst: TH
Chloride	**668**		**4.00**	**10.0**	**10.0**	**mg/L**	20	09-Jun-2022 17:17
Nitrogen, Nitrate (As N)	**0.0300**	J	**0.0300**	**0.100**	**0.100**	**mg/L**	1	09-Jun-2022 17:12
Nitrogen, Nitrite (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	09-Jun-2022 17:12
Sulfate	**1,040**		**4.00**	**10.0**	**10.0**	**mg/L**	20	09-Jun-2022 17:17
SUBCONTRACT ANALYSIS - CO2		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Jun-2022 10:19
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See attached		0	0	0	NA	1	10-Jun-2022 12:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW11_060822
Collection Date: 08-Jun-2022 11:40

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:24
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 19:24
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
1,1-Dichloroethane	**0.51**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Jun-2022 19:24
1,1-Dichloroethene	**2.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Jun-2022 19:24
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:24
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 19:24
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 19:24
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	10-Jun-2022 19:24
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:24
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 19:24
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:24
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 19:24
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:24
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:24
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:24
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 19:24
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	10-Jun-2022 19:24
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:24
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	10-Jun-2022 19:24
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 19:24
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:24
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:24
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:24
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:24
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:24
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:24
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	10-Jun-2022 19:24
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 19:24
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW11_060822
Collection Date: 08-Jun-2022 11:40

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:24
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:24
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:24
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:24
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	10-Jun-2022 19:24
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 19:24
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 19:24
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:24
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:24
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:24
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:24
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:24
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:24
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:24
Surr: 1,2-Dichloroethane-d4	*92.6*			**0**	*81-118*	*%REC*	*1*	*10-Jun-2022 19:24*
Surr: 4-Bromofluorobenzene	*95.0*			**0**	*85-114*	*%REC*	*1*	*10-Jun-2022 19:24*
Surr: Dibromofluoromethane	*93.9*			**0**	*80-119*	*%REC*	*1*	*10-Jun-2022 19:24*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*10-Jun-2022 19:24*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.250	U	0.144	0.250	1.00	ug/L	1	17-Jun-2022 13:42
Ethene	0.500	U	0.234	0.500	1.00	ug/L	1	17-Jun-2022 13:42
Methane	**1,410**		**10.7**	**25.0**	**50.0**	**ug/L**	100	17-Jun-2022 15:18
TOTAL ORGANIC CARBON BY E415.1		**Method:E415.1**						Analyst: SB
Organic Carbon, Total	**9.72**		**0.500**	**1.00**	**1.00**	**mg/L**	1	21-Jun-2022 03:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW11_060822
Collection Date: 08-Jun-2022 11:40

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: TH
Chloride	**1,880**		**10.0**	**25.0**	**25.0**	**mg/L**	50	09-Jun-2022 17:28
Nitrogen, Nitrate (As N)	**0.198**	J	**0.150**	**0.500**	**0.500**	**mg/L**	5	09-Jun-2022 17:23
Nitrogen, Nitrite (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	09-Jun-2022 17:23
Sulfate	**485**		**1.00**	**2.50**	**2.50**	**mg/L**	5	09-Jun-2022 17:23
SUBCONTRACT ANALYSIS - CO2		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Jun-2022 10:19
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See attached		0	0	0	NA	1	10-Jun-2022 12:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW24_060822
Collection Date: 08-Jun-2022 12:35

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:45
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 19:45
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:45
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:45
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:45
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 19:45
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 19:45
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	10-Jun-2022 19:45
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:45
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 19:45
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:45
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 19:45
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:45
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:45
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:45
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 19:45
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	10-Jun-2022 19:45
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:45
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	10-Jun-2022 19:45
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 19:45
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:45
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:45
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:45
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:45
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:45
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:45
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	10-Jun-2022 19:45
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 19:45
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW24_060822
Collection Date: 08-Jun-2022 12:35

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:45
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:45
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:45
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:45
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	10-Jun-2022 19:45
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 19:45
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 19:45
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 19:45
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:45
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:45
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:45
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:45
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 19:45
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 19:45
Surr: 1,2-Dichloroethane-d4	*92.4*			**0**	*81-118*	*%REC*	*1*	*10-Jun-2022 19:45*
Surr: 4-Bromofluorobenzene	*95.0*			**0**	*85-114*	*%REC*	*1*	*10-Jun-2022 19:45*
Surr: Dibromofluoromethane	*94.9*			**0**	*80-119*	*%REC*	*1*	*10-Jun-2022 19:45*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*10-Jun-2022 19:45*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW24_060822_a
Collection Date: 08-Jun-2022 12:35

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 20:06
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 20:06
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 20:06
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 20:06
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 20:06
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 20:06
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 20:06
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	10-Jun-2022 20:06
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 20:06
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 20:06
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 20:06
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 20:06
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 20:06
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 20:06
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 20:06
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 20:06
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	10-Jun-2022 20:06
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 20:06
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	10-Jun-2022 20:06
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 20:06
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 20:06
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 20:06
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 20:06
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 20:06
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 20:06
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 20:06
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	10-Jun-2022 20:06
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	10-Jun-2022 20:06
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 20:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW24_060822_a
Collection Date: 08-Jun-2022 12:35

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 20:06
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 20:06
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 20:06
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 20:06
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	10-Jun-2022 20:06
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Jun-2022 20:06
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	10-Jun-2022 20:06
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	10-Jun-2022 20:06
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 20:06
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 20:06
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 20:06
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 20:06
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	10-Jun-2022 20:06
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Jun-2022 20:06
Surr: 1,2-Dichloroethane-d4	*91.2*			**0**	*81-118*	*%REC*	*1*	*10-Jun-2022 20:06*
Surr: 4-Bromofluorobenzene	*93.9*			**0**	*85-114*	*%REC*	*1*	*10-Jun-2022 20:06*
Surr: Dibromofluoromethane	*93.7*			**0**	*80-119*	*%REC*	*1*	*10-Jun-2022 20:06*
Surr: Toluene-d8	*98.6*			**0**	*89-112*	*%REC*	*1*	*10-Jun-2022 20:06*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: Trip Blank
Collection Date: 08-Jun-2022 00:00

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-09
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 12:59
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 12:59
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 12:59
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 12:59
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 12:59
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 12:59
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 12:59
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Jun-2022 12:59
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 12:59
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 12:59
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 12:59
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 12:59
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 12:59
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 12:59
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 12:59
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Jun-2022 12:59
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Jun-2022 12:59
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 12:59
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Jun-2022 12:59
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Jun-2022 12:59
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 12:59
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 12:59
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 12:59
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 12:59
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 12:59
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 12:59
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Jun-2022 12:59
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 12:59
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 12:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: Trip Blank
Collection Date: 08-Jun-2022 00:00

ANALYTICAL REPORT
WorkOrder:HS22060453
Lab ID:HS22060453-09
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 12:59
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 12:59
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 12:59
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 12:59
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Jun-2022 12:59
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Jun-2022 12:59
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Jun-2022 12:59
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 12:59
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 12:59
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 12:59
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 12:59
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 12:59
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 12:59
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 12:59
Surr: 1,2-Dichloroethane-d4	*91.2*			**0**	*81-118*	*%REC*	*1*	*13-Jun-2022 12:59*
Surr: 4-Bromofluorobenzene	*93.4*			**0**	*85-114*	*%REC*	*1*	*13-Jun-2022 12:59*
Surr: Dibromofluoromethane	*92.8*			**0**	*80-119*	*%REC*	*1*	*13-Jun-2022 12:59*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*13-Jun-2022 12:59*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jun-22

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

Batch ID: 180277 **Start Date:** 22 Jun 2022 09:00 **End Date:** 22 Jun 2022 13:00
Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS22060453-05		10 (mL)	10 (mL)	1	120 plastic HNO3

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 180277 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS22060453-05	35AWW20_060822	08 Jun 2022 10:45		22 Jun 2022 09:00	22 Jun 2022 21:24	1
Batch ID: R410358 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS22060453-01	35AWW19_060822	08 Jun 2022 07:15			09 Jun 2022 16:08	20
HS22060453-01	35AWW19_060822	08 Jun 2022 07:15			09 Jun 2022 15:52	1
HS22060453-02	35AWW23_060822	08 Jun 2022 08:05			09 Jun 2022 16:19	20
HS22060453-02	35AWW23_060822	08 Jun 2022 08:05			09 Jun 2022 16:14	2
HS22060453-03	35AWW06_060822	08 Jun 2022 09:00			09 Jun 2022 16:30	20
HS22060453-03	35AWW06_060822	08 Jun 2022 09:00			09 Jun 2022 16:24	2
HS22060453-04	LHSMW07_060822	08 Jun 2022 09:50			09 Jun 2022 17:07	50
HS22060453-04	LHSMW07_060822	08 Jun 2022 09:50			09 Jun 2022 17:01	5
HS22060453-05	35AWW20_060822	08 Jun 2022 10:45			09 Jun 2022 17:17	20
HS22060453-05	35AWW20_060822	08 Jun 2022 10:45			09 Jun 2022 17:12	1
HS22060453-06	35AWW11_060822	08 Jun 2022 11:40			09 Jun 2022 17:28	50
HS22060453-06	35AWW11_060822	08 Jun 2022 11:40			09 Jun 2022 17:23	5
Batch ID: R410438 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS22060453-01	35AWW19_060822	08 Jun 2022 07:15			10 Jun 2022 18:00	1
HS22060453-02	35AWW23_060822	08 Jun 2022 08:05			10 Jun 2022 18:21	1
HS22060453-03	35AWW06_060822	08 Jun 2022 09:00			10 Jun 2022 18:42	1
HS22060453-04	LHSMW07_060822	08 Jun 2022 09:50			10 Jun 2022 19:03	1
HS22060453-06	35AWW11_060822	08 Jun 2022 11:40			10 Jun 2022 19:24	1
HS22060453-07	35AWW24_060822	08 Jun 2022 12:35			10 Jun 2022 19:45	1
HS22060453-08	35AWW24_060822_a	08 Jun 2022 12:35			10 Jun 2022 20:06	1
Batch ID: R410539 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS22060453-09	Trip Blank	08 Jun 2022 00:00			13 Jun 2022 12:59	1
Batch ID: R410539 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS22060453-05	35AWW20_060822	08 Jun 2022 10:45			13 Jun 2022 16:09	50
HS22060453-05	35AWW20_060822	08 Jun 2022 10:45			13 Jun 2022 14:23	5
Batch ID: R411032 (0)	**Test Name :** TOTAL ORGANIC CARBON BY E415.1				**Matrix:** Groundwater	
HS22060453-01	35AWW19_060822	08 Jun 2022 07:15			18 Jun 2022 01:10	1
HS22060453-02	35AWW23_060822	08 Jun 2022 08:05			18 Jun 2022 01:25	1
HS22060453-03	35AWW06_060822	08 Jun 2022 09:00			18 Jun 2022 01:40	1
Batch ID: R411152 (0)	**Test Name :** TOTAL ORGANIC CARBON BY E415.1				**Matrix:** Groundwater	
HS22060453-04	LHSMW07_060822	08 Jun 2022 09:50			21 Jun 2022 03:10	1
HS22060453-05	35AWW20_060822	08 Jun 2022 10:45			21 Jun 2022 03:25	1
HS22060453-06	35AWW11_060822	08 Jun 2022 11:40			21 Jun 2022 03:39	1

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R411175 (1)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS22060453-01	35AWW19_060822	08 Jun 2022 07:15			17 Jun 2022 12:13	1
HS22060453-02	35AWW23_060822	08 Jun 2022 08:05			17 Jun 2022 13:57	100
HS22060453-02	35AWW23_060822	08 Jun 2022 08:05			17 Jun 2022 12:41	1
HS22060453-03	35AWW06_060822	08 Jun 2022 09:00			17 Jun 2022 14:10	100
HS22060453-03	35AWW06_060822	08 Jun 2022 09:00			17 Jun 2022 12:54	1
HS22060453-04	LHSMW07_060822	08 Jun 2022 09:50			17 Jun 2022 14:51	100
HS22060453-04	LHSMW07_060822	08 Jun 2022 09:50			17 Jun 2022 13:05	1
HS22060453-05	35AWW20_060822	08 Jun 2022 10:45			17 Jun 2022 15:04	100
HS22060453-05	35AWW20_060822	08 Jun 2022 10:45			17 Jun 2022 13:20	1
HS22060453-06	35AWW11_060822	08 Jun 2022 11:40			17 Jun 2022 15:18	100
HS22060453-06	35AWW11_060822	08 Jun 2022 11:40			17 Jun 2022 13:42	1
Batch ID: R411757 (0)	**Test Name :** SUBCONTRACT ANALYSIS - CO2				**Matrix:** Groundwater	
HS22060453-01	35AWW19_060822	08 Jun 2022 07:15			29 Jun 2022 10:19	1
HS22060453-02	35AWW23_060822	08 Jun 2022 08:05			29 Jun 2022 10:19	1
HS22060453-03	35AWW06_060822	08 Jun 2022 09:00			29 Jun 2022 10:19	1
HS22060453-04	LHSMW07_060822	08 Jun 2022 09:50			29 Jun 2022 10:19	1
HS22060453-05	35AWW20_060822	08 Jun 2022 10:45			29 Jun 2022 10:19	1
HS22060453-06	35AWW11_060822	08 Jun 2022 11:40			29 Jun 2022 10:19	1
Batch ID: R411980 (0)	**Test Name :** SUBCONTRACT ANALYSIS - DHC/DHB				**Matrix:** Groundwater	
HS22060453-01	35AWW19_060822	08 Jun 2022 07:15			10 Jun 2022 12:00	1
HS22060453-02	35AWW23_060822	08 Jun 2022 08:05			10 Jun 2022 12:00	1
HS22060453-03	35AWW06_060822	08 Jun 2022 09:00			10 Jun 2022 12:00	1
HS22060453-04	LHSMW07_060822	08 Jun 2022 09:50			10 Jun 2022 12:00	1
HS22060453-05	35AWW20_060822	08 Jun 2022 10:45			10 Jun 2022 12:00	1
HS22060453-06	35AWW11_060822	08 Jun 2022 11:40			10 Jun 2022 12:00	1

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R411175 (1) **Instrument: FID-4** **Method: DISSOLVED GASES BY RSK-175**

MBLK Sample ID: **MBLK-220617** Units: **ug/L** Analysis Date: **17-Jun-2022 09:43**
Client ID: Run ID: **FID-4_411175** SeqNo: **6705016** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.250	1.00								U
Ethene	0.500	1.00								U
Methane	0.250	0.500								U

LCS Sample ID: **LCS-220617** Units: **ug/L** Analysis Date: **17-Jun-2022 09:57**
Client ID: Run ID: **FID-4_411175** SeqNo: **6705017** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	20.98	1.00	18.04	0	116	74 - 131				
Ethene	20.59	1.00	16.8	0	123	72 - 133				
Methane	10.41	0.500	9.647	0	108	73 - 125				

LCSD Sample ID: **LCSD-220617** Units: **ug/L** Analysis Date: **17-Jun-2022 10:09**
Client ID: Run ID: **FID-4_411175** SeqNo: **6705018** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	20.52	1.00	18.04	0	114	74 - 131	20.98	2.2	30	
Ethene	20.2	1.00	16.8	0	120	72 - 133	20.59	1.87	30	
Methane	10.46	0.500	9.647	0	108	73 - 125	10.41	0.433	30	

The following samples were analyzed in this batch: HS22060453-01 HS22060453-02 HS22060453-03 HS22060453-04 HS22060453-05 HS22060453-06

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: 180277 (0) **Instrument: ICPMS07** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-180277** Units: **mg/L** Analysis Date: **22-Jun-2022 20:16**
Client ID: Run ID: **ICPMS07_411293** SeqNo: **6708359** PrepDate: **22-Jun-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.00125	0.00500								U

LCS Sample ID: **LCS-180277** Units: **mg/L** Analysis Date: **22-Jun-2022 20:18**
Client ID: Run ID: **ICPMS07_411293** SeqNo: **6708360** PrepDate: **22-Jun-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.04829	0.00500	0.05	0	96.6	84 - 116				

MS Sample ID: **HS22060605-01MS** Units: **mg/L** Analysis Date: **22-Jun-2022 21:20**
Client ID: Run ID: **ICPMS07_411293** SeqNo: **6708385** PrepDate: **22-Jun-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.1433	0.00500	0.05	0.09258	101	84 - 116				

MSD Sample ID: **HS22060605-01MSD** Units: **mg/L** Analysis Date: **22-Jun-2022 21:22**
Client ID: Run ID: **ICPMS07_411293** SeqNo: **6708386** PrepDate: **22-Jun-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.1353	0.00500	0.05	0.09258	85.4	84 - 116	0.1433	5.72	20	

PDS Sample ID: **HS22060605-01PDS** Units: **mg/L** Analysis Date: **22-Jun-2022 20:28**
Client ID: Run ID: **ICPMS07_411293** SeqNo: **6708362** PrepDate: **22-Jun-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.1863	0.00500	0.1	0.09258	93.7	80 - 120				

SD Sample ID: **HS22060605-01SD** Units: **mg/L** Analysis Date: **22-Jun-2022 20:22**
Client ID: Run ID: **ICPMS07_411293** SeqNo: **6708361** PrepDate: **22-Jun-2022** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	0.09225	0.0250					0.09258	0.356	10	

The following samples were analyzed in this batch: HS22060453-05

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410438 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-220610** Units: **ug/L** Analysis Date: **10-Jun-2022 12:02**
Client ID: Run ID: **VOA6_410438** SeqNo: **6687819** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1.0	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	1.0	1.0								U
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	1.0	1.0								U
1,2,3-Trichlorobenzene	1.0	1.0								U
1,2,3-Trichloropropane	1.0	1.0								U
1,2,4-Trichlorobenzene	1.0	1.0								U
1,2,4-Trimethylbenzene	1.0	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	1.0	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	1.0	1.0								U
1,3,5-Trimethylbenzene	1.0	1.0								U
1,3-Dichlorobenzene	1.0	1.0								U
1,3-Dichloropropane	1.0	1.0								U
1,4-Dichlorobenzene	1.0	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	1.0	1.0								U
2-Hexanone	2.0	2.0								U
4-Chlorotoluene	1.0	1.0								U
4-Isopropyltoluene	1.0	1.0								U
4-Methyl-2-pentanone	2.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	1.0	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	1.0	1.0								U
Bromomethane	1.0	1.0								U

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410438 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-220610** Units: **ug/L** Analysis Date: **10-Jun-2022 12:02**
Client ID: Run ID: **VOA6_410438** SeqNo: **6687819** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	2.0	2.0								U
Carbon tetrachloride	1.0	1.0								U
Chlorobenzene	1.0	1.0								U
Chloroethane	1.0	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	1.0	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	1.0	1.0								U
Ethylbenzene	1.0	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	1.0	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	2.0	2.0								U
Naphthalene	1.0	1.0								U
n-Butylbenzene	1.0	1.0								U
n-Propylbenzene	1.0	1.0								U
o-Xylene	1.0	1.0								U
sec-Butylbenzene	1.0	1.0								U
Styrene	1.0	1.0								U
tert-Butylbenzene	1.0	1.0								U
Tetrachloroethene	1.0	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	1.0	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.99*	*1.0*	*50*	*0*	*90.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*46.12*	*1.0*	*50*	*0*	*92.2*	*85 - 114*				
Surr: Dibromofluoromethane	*46.59*	*1.0*	*50*	*0*	*93.2*	*80 - 119*				
Surr: Toluene-d8	*50.43*	*1.0*	*50*	*0*	*101*	*89 - 112*				

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410438 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-220610** Units: **ug/L** Analysis Date: **10-Jun-2022 11:20**
Client ID: Run ID: **VOA6_410438** SeqNo: **6687818** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.25	1.0	20	0	96.3	78 - 124				
1,1,1-Trichloroethane	18.19	1.0	20	0	91.0	74 - 131				
1,1,2,2-Tetrachloroethane	18.42	1.0	20	0	92.1	71 - 121				
1,1,2-Trichloroethane	18.92	1.0	20	0	94.6	80 - 119				
1,1-Dichloroethane	19.04	1.0	20	0	95.2	77 - 125				
1,1-Dichloroethene	17.53	1.0	20	0	87.7	71 - 131				
1,1-Dichloropropene	18.87	1.0	20	0	94.4	78 - 125				
1,2,3-Trichlorobenzene	18.33	1.0	20	0	91.7	69 - 129				
1,2,3-Trichloropropane	19.18	1.0	20	0	95.9	73 - 122				
1,2,4-Trichlorobenzene	19.01	1.0	20	0	95.1	69 - 130				
1,2,4-Trimethylbenzene	19.67	1.0	20	0	98.3	76 - 124				
1,2-Dibromo-3-chloropropane	16.2	1.0	20	0	81.0	62 - 128				
1,2-Dibromoethane	19.34	1.0	20	0	96.7	77 - 121				
1,2-Dichlorobenzene	19.55	1.0	20	0	97.7	80 - 119				
1,2-Dichloroethane	18.84	1.0	20	0	94.2	73 - 128				
1,2-Dichloropropane	20	1.0	20	0	100.0	78 - 122				
1,3,5-Trimethylbenzene	19.62	1.0	20	0	98.1	75 - 124				
1,3-Dichlorobenzene	19.7	1.0	20	0	98.5	80 - 119				
1,3-Dichloropropane	18.94	1.0	20	0	94.7	80 - 119				
1,4-Dichlorobenzene	19.81	1.0	20	0	99.1	79 - 118				
2,2-Dichloropropane	19.02	1.0	20	0	95.1	60 - 139				
2-Butanone	30.6	2.0	40	0	76.5	56 - 143				
2-Chlorotoluene	19.53	1.0	20	0	97.6	79 - 122				
2-Hexanone	34.71	2.0	40	0	86.8	57 - 139				
4-Chlorotoluene	20.06	1.0	20	0	100	78 - 122				
4-Isopropyltoluene	20.12	1.0	20	0	101	77 - 127				
4-Methyl-2-pentanone	35.45	2.0	40	0	88.6	67 - 130				
Acetone	31.52	2.0	40	0	78.8	39 - 160				
Benzene	19.95	1.0	20	0	99.8	79 - 120				
Bromobenzene	19.98	1.0	20	0	99.9	80 - 120				
Bromochloromethane	18.91	1.0	20	0	94.6	78 - 123				
Bromodichloromethane	18.9	1.0	20	0	94.5	79 - 125				
Bromoform	18.51	1.0	20	0	92.5	66 - 130				
Bromomethane	17.76	1.0	20	0	88.8	53 - 141				

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410438 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-220610** Units: **ug/L** Analysis Date: **10-Jun-2022 11:20**
Client ID: Run ID: **VOA6_410438** SeqNo: **6687818** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	36.99	2.0	40	0	92.5	64 - 133				
Carbon tetrachloride	17.51	1.0	20	0	87.6	72 - 136				
Chlorobenzene	20.13	1.0	20	0	101	82 - 118				
Chloroethane	18.67	1.0	20	0	93.3	60 - 138				
Chloroform	18.77	1.0	20	0	93.8	79 - 124				
Chloromethane	19.66	1.0	20	0	98.3	50 - 139				
cis-1,2-Dichloroethene	19.77	1.0	20	0	98.9	78 - 123				
cis-1,3-Dichloropropene	19.52	1.0	20	0	97.6	75 - 124				
Dibromochloromethane	19.08	1.0	20	0	95.4	74 - 126				
Dibromomethane	19.03	1.0	20	0	95.2	79 - 123				
Dichlorodifluoromethane	18.12	1.0	20	0	90.6	32 - 152				
Ethylbenzene	20.13	1.0	20	0	101	79 - 121				
Hexachlorobutadiene	20.94	1.0	20	0	105	66 - 134				
Isopropylbenzene	18.73	1.0	20	0	93.6	72 - 131				
m,p-Xylene	39.52	2.0	40	0	98.8	80 - 121				
Methylene chloride	17.85	2.0	20	0	89.2	74 - 124				
Naphthalene	16.2	1.0	20	0	81.0	61 - 128				
n-Butylbenzene	20.11	1.0	20	0	101	75 - 128				
n-Propylbenzene	19.8	1.0	20	0	99.0	76 - 126				
o-Xylene	20.19	1.0	20	0	101	78 - 122				
sec-Butylbenzene	19.42	1.0	20	0	97.1	77 - 126				
Styrene	20.07	1.0	20	0	100	78 - 123				
tert-Butylbenzene	19.52	1.0	20	0	97.6	78 - 124				
Tetrachloroethene	19.66	1.0	20	0	98.3	74 - 129				
Toluene	20.02	1.0	20	0	100	80 - 121				
trans-1,2-Dichloroethene	19.13	1.0	20	0	95.6	75 - 124				
trans-1,3-Dichloropropene	19.14	1.0	20	0	95.7	73 - 127				
Trichloroethene	19.79	1.0	20	0	98.9	79 - 123				
Trichlorofluoromethane	17.01	1.0	20	0	85.0	65 - 141				
Vinyl chloride	17.72	1.0	20	0	88.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.88*	*1.0*	*50*	*0*	*97.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.96*	*1.0*	*50*	*0*	*99.9*	*85 - 114*				
Surr: Dibromofluoromethane	*48.91*	*1.0*	*50*	*0*	*97.8*	*80 - 119*				
Surr: Toluene-d8	*48.67*	*1.0*	*50*	*0*	*97.3*	*89 - 112*				

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410438 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS22060516-04MS** Units: **ug/L** Analysis Date: **10-Jun-2022 14:50**
Client ID: Run ID: **VOA6_410438** SeqNo: **6687827** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.35	1.0	20	0	102	78 - 124				
1,1,1-Trichloroethane	19.39	1.0	20	0	97.0	74 - 131				
1,1,2,2-Tetrachloroethane	19.66	1.0	20	0	98.3	71 - 121				
1,1,2-Trichloroethane	19.31	1.0	20	0	96.6	80 - 119				
1,1-Dichloroethane	19.44	1.0	20	0	97.2	77 - 125				
1,1-Dichloroethene	18.69	1.0	20	0	93.4	71 - 131				
1,1-Dichloropropene	20.69	1.0	20	0	103	78 - 125				
1,2,3-Trichlorobenzene	19.35	1.0	20	0	96.8	69 - 129				
1,2,3-Trichloropropane	19	1.0	20	0	95.0	73 - 122				
1,2,4-Trichlorobenzene	19.85	1.0	20	0	99.3	69 - 130				
1,2,4-Trimethylbenzene	21.4	1.0	20	0	107	76 - 124				
1,2-Dibromo-3-chloropropane	15.72	1.0	20	0	78.6	62 - 128				
1,2-Dibromoethane	19.75	1.0	20	0	98.7	77 - 121				
1,2-Dichlorobenzene	20.76	1.0	20	0	104	80 - 119				
1,2-Dichloroethane	19.64	1.0	20	0	98.2	73 - 128				
1,2-Dichloropropane	19.88	1.0	20	0	99.4	78 - 122				
1,3,5-Trimethylbenzene	21.49	1.0	20	0	107	75 - 124				
1,3-Dichlorobenzene	20.88	1.0	20	0	104	80 - 119				
1,3-Dichloropropane	19.73	1.0	20	0	98.7	80 - 119				
1,4-Dichlorobenzene	21.2	1.0	20	0	106	79 - 118				
2,2-Dichloropropane	19.69	1.0	20	0	98.4	60 - 139				
2-Butanone	31.23	2.0	40	0	78.1	56 - 143				
2-Chlorotoluene	20.8	1.0	20	0	104	79 - 122				
2-Hexanone	37.7	2.0	40	0	94.3	57 - 139				
4-Chlorotoluene	21.24	1.0	20	0	106	78 - 122				
4-Isopropyltoluene	22.72	1.0	20	0	114	77 - 127				
4-Methyl-2-pentanone	38.89	2.0	40	0	97.2	67 - 130				
Acetone	25.32	2.0	40	0	63.3	39 - 160				
Benzene	20.23	1.0	20	0	101	79 - 120				
Bromobenzene	21.45	1.0	20	0	107	80 - 120				
Bromochloromethane	18.89	1.0	20	0	94.5	78 - 123				
Bromodichloromethane	18.78	1.0	20	0	93.9	79 - 125				
Bromoform	18.95	1.0	20	0	94.8	66 - 130				
Bromomethane	14.44	1.0	20	0	72.2	53 - 141				

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410438 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS22060516-04MS** Units: **ug/L** Analysis Date: **10-Jun-2022 14:50**
Client ID: Run ID: **VOA6_410438** SeqNo: **6687827** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	39.18	2.0	40	0	98.0	64 - 133				
Carbon tetrachloride	19.81	1.0	20	0	99.1	72 - 136				
Chlorobenzene	21.01	1.0	20	0	105	82 - 118				
Chloroethane	17.15	1.0	20	0	85.7	60 - 138				
Chloroform	18.74	1.0	20	0	93.7	79 - 124				
Chloromethane	18.8	1.0	20	0	94.0	50 - 139				
cis-1,2-Dichloroethene	19.66	1.0	20	0	98.3	78 - 123				
cis-1,3-Dichloropropene	19.02	1.0	20	0	95.1	75 - 124				
Dibromochloromethane	19.43	1.0	20	0	97.2	74 - 126				
Dibromomethane	18.87	1.0	20	0	94.4	79 - 123				
Dichlorodifluoromethane	13.18	1.0	20	0	65.9	32 - 152				
Ethylbenzene	21.31	1.0	20	0	107	79 - 121				
Hexachlorobutadiene	23.11	1.0	20	0	116	66 - 134				
Isopropylbenzene	20.93	1.0	20	0	105	72 - 131				
m,p-Xylene	43.02	2.0	40	0	108	80 - 121				
Methylene chloride	17.58	2.0	20	0	87.9	74 - 124				
Naphthalene	17.45	1.0	20	0	87.2	61 - 128				
n-Butylbenzene	24.61	1.0	20	1.681	115	75 - 128				
n-Propylbenzene	22.81	1.0	20	0.5623	111	76 - 126				
o-Xylene	21.3	1.0	20	0	106	78 - 122				
sec-Butylbenzene	24.07	1.0	20	1.456	113	77 - 126				
Styrene	20.98	1.0	20	0	105	78 - 123				
tert-Butylbenzene	22.38	1.0	20	0	112	78 - 124				
Tetrachloroethene	23.06	1.0	20	0	115	74 - 129				
Toluene	21.37	1.0	20	0	107	80 - 121				
trans-1,2-Dichloroethene	20.08	1.0	20	0	100	75 - 124				
trans-1,3-Dichloropropene	18.59	1.0	20	0	93.0	73 - 127				
Trichloroethene	20.6	1.0	20	0	103	79 - 123				
Trichlorofluoromethane	18.69	1.0	20	0	93.4	65 - 141				
Vinyl chloride	17.44	1.0	20	0	87.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.44*	*1.0*	*50*	*0*	*92.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.2*	*1.0*	*50*	*0*	*98.4*	*85 - 114*				
Surr: Dibromofluoromethane	*47.12*	*1.0*	*50*	*0*	*94.2*	*80 - 119*				
Surr: Toluene-d8	*49.92*	*1.0*	*50*	*0*	*99.8*	*89 - 112*				

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410438 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22060516-04MSD** Units: **ug/L** Analysis Date: **10-Jun-2022 15:11**
Client ID: Run ID: **VOA6_410438** SeqNo: **6687828** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.38	1.0	20	0	96.9	78 - 124	20.35	4.86	20	
1,1,1-Trichloroethane	18.37	1.0	20	0	91.8	74 - 131	19.39	5.42	20	
1,1,2,2-Tetrachloroethane	19.65	1.0	20	0	98.3	71 - 121	19.66	0.0256	20	
1,1,2-Trichloroethane	18.56	1.0	20	0	92.8	80 - 119	19.31	3.96	20	
1,1-Dichloroethane	18.86	1.0	20	0	94.3	77 - 125	19.44	3.07	20	
1,1-Dichloroethene	17.66	1.0	20	0	88.3	71 - 131	18.69	5.65	20	
1,1-Dichloropropene	19.64	1.0	20	0	98.2	78 - 125	20.69	5.21	20	
1,2,3-Trichlorobenzene	21.2	1.0	20	0	106	69 - 129	19.35	9.12	20	
1,2,3-Trichloropropane	18.65	1.0	20	0	93.2	73 - 122	19	1.88	20	
1,2,4-Trichlorobenzene	20.69	1.0	20	0	103	69 - 130	19.85	4.15	20	
1,2,4-Trimethylbenzene	20.48	1.0	20	0	102	76 - 124	21.4	4.41	20	
1,2-Dibromo-3-chloropropane	17.31	1.0	20	0	86.5	62 - 128	15.72	9.59	20	
1,2-Dibromoethane	19.1	1.0	20	0	95.5	77 - 121	19.75	3.36	20	
1,2-Dichlorobenzene	20.32	1.0	20	0	102	80 - 119	20.76	2.16	20	
1,2-Dichloroethane	18.55	1.0	20	0	92.7	73 - 128	19.64	5.75	20	
1,2-Dichloropropane	19.09	1.0	20	0	95.4	78 - 122	19.88	4.08	20	
1,3,5-Trimethylbenzene	20.52	1.0	20	0	103	75 - 124	21.49	4.63	20	
1,3-Dichlorobenzene	20.15	1.0	20	0	101	80 - 119	20.88	3.56	20	
1,3-Dichloropropane	19.36	1.0	20	0	96.8	80 - 119	19.73	1.9	20	
1,4-Dichlorobenzene	20.4	1.0	20	0	102	79 - 118	21.2	3.86	20	
2,2-Dichloropropane	18.66	1.0	20	0	93.3	60 - 139	19.69	5.33	20	
2-Butanone	33.61	2.0	40	0	84.0	56 - 143	31.23	7.35	20	
2-Chlorotoluene	19.76	1.0	20	0	98.8	79 - 122	20.8	5.12	20	
2-Hexanone	37.49	2.0	40	0	93.7	57 - 139	37.7	0.566	20	
4-Chlorotoluene	20.44	1.0	20	0	102	78 - 122	21.24	3.84	20	
4-Isopropyltoluene	21.67	1.0	20	0	108	77 - 127	22.72	4.72	20	
4-Methyl-2-pentanone	38.13	2.0	40	0	95.3	67 - 130	38.89	1.99	20	
Acetone	25.21	2.0	40	0	63.0	39 - 160	25.32	0.438	20	
Benzene	19.42	1.0	20	0	97.1	79 - 120	20.23	4.1	20	
Bromobenzene	20.38	1.0	20	0	102	80 - 120	21.45	5.11	20	
Bromochloromethane	18.07	1.0	20	0	90.4	78 - 123	18.89	4.43	20	
Bromodichloromethane	18.28	1.0	20	0	91.4	79 - 125	18.78	2.69	20	
Bromoform	18.37	1.0	20	0	91.9	66 - 130	18.95	3.09	20	
Bromomethane	13.63	1.0	20	0	68.1	53 - 141	14.44	5.82	20	

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410438 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS22060516-04MSD** Units: **ug/L** Analysis Date: **10-Jun-2022 15:11**
Client ID: Run ID: **VOA6_410438** SeqNo: **6687828** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	36.9	2.0	40	0	92.3	64 - 133	39.18	5.99	20	
Carbon tetrachloride	18.9	1.0	20	0	94.5	72 - 136	19.81	4.7	20	
Chlorobenzene	19.68	1.0	20	0	98.4	82 - 118	21.01	6.53	20	
Chloroethane	17.07	1.0	20	0	85.4	60 - 138	17.15	0.451	20	
Chloroform	18.13	1.0	20	0	90.6	79 - 124	18.74	3.35	20	
Chloromethane	16.99	1.0	20	0	84.9	50 - 139	18.8	10.1	20	
cis-1,2-Dichloroethene	18.98	1.0	20	0	94.9	78 - 123	19.66	3.56	20	
cis-1,3-Dichloropropene	18.83	1.0	20	0	94.1	75 - 124	19.02	0.999	20	
Dibromochloromethane	18.89	1.0	20	0	94.5	74 - 126	19.43	2.84	20	
Dibromomethane	18.52	1.0	20	0	92.6	79 - 123	18.87	1.88	20	
Dichlorodifluoromethane	12.43	1.0	20	0	62.1	32 - 152	13.18	5.84	20	
Ethylbenzene	20.19	1.0	20	0	101	79 - 121	21.31	5.42	20	
Hexachlorobutadiene	22.4	1.0	20	0	112	66 - 134	23.11	3.11	20	
Isopropylbenzene	19.88	1.0	20	0	99.4	72 - 131	20.93	5.15	20	
m,p-Xylene	40.21	2.0	40	0	101	80 - 121	43.02	6.75	20	
Methylene chloride	17.05	2.0	20	0	85.3	74 - 124	17.58	3.08	20	
Naphthalene	20.55	1.0	20	0	103	61 - 128	17.45	16.3	20	
n-Butylbenzene	23.43	1.0	20	1.681	109	75 - 128	24.61	4.91	20	
n-Propylbenzene	21.71	1.0	20	0.5623	106	76 - 126	22.81	4.97	20	
o-Xylene	20.02	1.0	20	0	100	78 - 122	21.3	6.2	20	
sec-Butylbenzene	22.76	1.0	20	1.456	107	77 - 126	24.07	5.57	20	
Styrene	19.75	1.0	20	0	98.8	78 - 123	20.98	6.03	20	
tert-Butylbenzene	21.48	1.0	20	0	107	78 - 124	22.38	4.12	20	
Tetrachloroethene	20.66	1.0	20	0	103	74 - 129	23.06	11	20	
Toluene	19.86	1.0	20	0	99.3	80 - 121	21.37	7.32	20	
trans-1,2-Dichloroethene	18.96	1.0	20	0	94.8	75 - 124	20.08	5.73	20	
trans-1,3-Dichloropropene	18.39	1.0	20	0	92.0	73 - 127	18.59	1.08	20	
Trichloroethene	19.26	1.0	20	0	96.3	79 - 123	20.6	6.73	20	
Trichlorofluoromethane	17.62	1.0	20	0	88.1	65 - 141	18.69	5.87	20	
Vinyl chloride	16.43	1.0	20	0	82.1	58 - 137	17.44	5.95	20	
Surr: 1,2-Dichloroethane-d4	*44.57*	*1.0*	*50*	*0*	*89.1*	*81 - 118*	*46.44*	*4.12*	*20*	
Surr: 4-Bromofluorobenzene	*49.03*	*1.0*	*50*	*0*	*98.1*	*85 - 114*	*49.2*	*0.345*	*20*	
Surr: Dibromofluoromethane	*46.64*	*1.0*	*50*	*0*	*93.3*	*80 - 119*	*47.12*	*1.04*	*20*	
Surr: Toluene-d8	*49.4*	*1.0*	*50*	*0*	*98.8*	*89 - 112*	*49.92*	*1.04*	*20*	

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410438 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:

HS22060453-01	HS22060453-02	HS22060453-03	HS22060453-04
HS22060453-06	HS22060453-07	HS22060453-08	

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-220613** Units: **ug/L** Analysis Date: **13-Jun-2022 12:38**
Client ID: Run ID: **VOA6_410539** SeqNo: **6690144** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1.0	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	1.0	1.0								U
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	1.0	1.0								U
1,2,3-Trichlorobenzene	1.0	1.0								U
1,2,3-Trichloropropane	1.0	1.0								U
1,2,4-Trichlorobenzene	1.0	1.0								U
1,2,4-Trimethylbenzene	1.0	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	1.0	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	1.0	1.0								U
1,3,5-Trimethylbenzene	1.0	1.0								U
1,3-Dichlorobenzene	1.0	1.0								U
1,3-Dichloropropane	1.0	1.0								U
1,4-Dichlorobenzene	1.0	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	1.0	1.0								U
2-Hexanone	2.0	2.0								U
4-Chlorotoluene	1.0	1.0								U
4-Isopropyltoluene	1.0	1.0								U
4-Methyl-2-pentanone	2.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	1.0	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	1.0	1.0								U
Bromomethane	1.0	1.0								U

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-220613** Units: **ug/L** Analysis Date: **13-Jun-2022 12:38**
Client ID: Run ID: **VOA6_410539** SeqNo: **6690144** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	2.0	2.0								U
Carbon tetrachloride	1.0	1.0								U
Chlorobenzene	1.0	1.0								U
Chloroethane	1.0	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	1.0	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	1.0	1.0								U
Ethylbenzene	1.0	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	1.0	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	2.0	2.0								U
Naphthalene	1.0	1.0								U
n-Butylbenzene	1.0	1.0								U
n-Propylbenzene	1.0	1.0								U
o-Xylene	1.0	1.0								U
sec-Butylbenzene	1.0	1.0								U
Styrene	1.0	1.0								U
tert-Butylbenzene	1.0	1.0								U
Tetrachloroethene	1.0	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	1.0	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*45.02*	*1.0*	*50*	*0*	*90.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*46.8*	*1.0*	*50*	*0*	*93.6*	*85 - 114*				
Surr: Dibromofluoromethane	*46.31*	*1.0*	*50*	*0*	*92.6*	*80 - 119*				
Surr: Toluene-d8	*50.38*	*1.0*	*50*	*0*	*101*	*89 - 112*				

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-220613** Units: **ug/L** Analysis Date: **13-Jun-2022 11:56**
Client ID: Run ID: **VOA6_410539** SeqNo: **6690143** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.28	1.0	20	0	101	78 - 124				
1,1,1-Trichloroethane	19.37	1.0	20	0	96.8	74 - 131				
1,1,2,2-Tetrachloroethane	19.68	1.0	20	0	98.4	71 - 121				
1,1,2-Trichloroethane	19.57	1.0	20	0	97.9	80 - 119				
1,1-Dichloroethane	19.91	1.0	20	0	99.5	77 - 125				
1,1-Dichloroethene	18.1	1.0	20	0	90.5	71 - 131				
1,1-Dichloropropene	20.53	1.0	20	0	103	78 - 125				
1,2,3-Trichlorobenzene	19.8	1.0	20	0	99.0	69 - 129				
1,2,3-Trichloropropane	19.4	1.0	20	0	97.0	73 - 122				
1,2,4-Trichlorobenzene	20.83	1.0	20	0	104	69 - 130				
1,2,4-Trimethylbenzene	20.88	1.0	20	0	104	76 - 124				
1,2-Dibromo-3-chloropropane	17.47	1.0	20	0	87.4	62 - 128				
1,2-Dibromoethane	19.86	1.0	20	0	99.3	77 - 121				
1,2-Dichlorobenzene	20.52	1.0	20	0	103	80 - 119				
1,2-Dichloroethane	20.45	1.0	20	0	102	73 - 128				
1,2-Dichloropropane	20.61	1.0	20	0	103	78 - 122				
1,3,5-Trimethylbenzene	20.65	1.0	20	0	103	75 - 124				
1,3-Dichlorobenzene	20.9	1.0	20	0	105	80 - 119				
1,3-Dichloropropane	19.77	1.0	20	0	98.8	80 - 119				
1,4-Dichlorobenzene	20.34	1.0	20	0	102	79 - 118				
2,2-Dichloropropane	20.29	1.0	20	0	101	60 - 139				
2-Butanone	36.91	2.0	40	0	92.3	56 - 143				
2-Chlorotoluene	20.36	1.0	20	0	102	79 - 122				
2-Hexanone	38.49	2.0	40	0	96.2	57 - 139				
4-Chlorotoluene	20.84	1.0	20	0	104	78 - 122				
4-Isopropyltoluene	21.31	1.0	20	0	107	77 - 127				
4-Methyl-2-pentanone	37.96	2.0	40	0	94.9	67 - 130				
Acetone	37.36	2.0	40	0	93.4	39 - 160				
Benzene	20.62	1.0	20	0	103	79 - 120				
Bromobenzene	20.77	1.0	20	0	104	80 - 120				
Bromochloromethane	19.71	1.0	20	0	98.6	78 - 123				
Bromodichloromethane	19.62	1.0	20	0	98.1	79 - 125				
Bromoform	19.64	1.0	20	0	98.2	66 - 130				
Bromomethane	17.04	1.0	20	0	85.2	53 - 141				

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-220613** Units: **ug/L** Analysis Date: **13-Jun-2022 11:56**
Client ID: Run ID: **VOA6_410539** SeqNo: **6690143** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	39.13	2.0	40	0	97.8	64 - 133				
Carbon tetrachloride	19.52	1.0	20	0	97.6	72 - 136				
Chlorobenzene	20.49	1.0	20	0	102	82 - 118				
Chloroethane	18.22	1.0	20	0	91.1	60 - 138				
Chloroform	19.24	1.0	20	0	96.2	79 - 124				
Chloromethane	19.86	1.0	20	0	99.3	50 - 139				
cis-1,2-Dichloroethene	20.32	1.0	20	0	102	78 - 123				
cis-1,3-Dichloropropene	20.65	1.0	20	0	103	75 - 124				
Dibromochloromethane	19.89	1.0	20	0	99.4	74 - 126				
Dibromomethane	19.91	1.0	20	0	99.6	79 - 123				
Dichlorodifluoromethane	18.84	1.0	20	0	94.2	32 - 152				
Ethylbenzene	20.66	1.0	20	0	103	79 - 121				
Hexachlorobutadiene	20.91	1.0	20	0	105	66 - 134				
Isopropylbenzene	19.78	1.0	20	0	98.9	72 - 131				
m,p-Xylene	41.1	2.0	40	0	103	80 - 121				
Methylene chloride	18.62	2.0	20	0	93.1	74 - 124				
Naphthalene	19.55	1.0	20	0	97.8	61 - 128				
n-Butylbenzene	20.85	1.0	20	0	104	75 - 128				
n-Propylbenzene	20.86	1.0	20	0	104	76 - 126				
o-Xylene	20.63	1.0	20	0	103	78 - 122				
sec-Butylbenzene	20.73	1.0	20	0	104	77 - 126				
Styrene	20.5	1.0	20	0	102	78 - 123				
tert-Butylbenzene	20.89	1.0	20	0	104	78 - 124				
Tetrachloroethene	20.46	1.0	20	0	102	74 - 129				
Toluene	20.56	1.0	20	0	103	80 - 121				
trans-1,2-Dichloroethene	20.11	1.0	20	0	101	75 - 124				
trans-1,3-Dichloropropene	20.07	1.0	20	0	100	73 - 127				
Trichloroethene	20.61	1.0	20	0	103	79 - 123				
Trichlorofluoromethane	17.77	1.0	20	0	88.9	65 - 141				
Vinyl chloride	18.1	1.0	20	0	90.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*47.34*	*1.0*	*50*	*0*	*94.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.62*	*1.0*	*50*	*0*	*99.2*	*85 - 114*				
Surr: Dibromofluoromethane	*48.84*	*1.0*	*50*	*0*	*97.7*	*80 - 119*				
Surr: Toluene-d8	*48.41*	*1.0*	*50*	*0*	*96.8*	*89 - 112*				

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS22060604-04MS** Units: **ug/L** Analysis Date: **13-Jun-2022 15:27**
Client ID: Run ID: **VOA6_410539** SeqNo: **6690152** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.81	1.0	20	0	104	78 - 124				
1,1,1-Trichloroethane	19.04	1.0	20	0	95.2	74 - 131				
1,1,2,2-Tetrachloroethane	20.98	1.0	20	0	105	71 - 121				
1,1,2-Trichloroethane	20.03	1.0	20	0	100	80 - 119				
1,1-Dichloroethane	19.68	1.0	20	0	98.4	77 - 125				
1,1-Dichloroethene	17.72	1.0	20	0	88.6	71 - 131				
1,1-Dichloropropene	20.14	1.0	20	0	101	78 - 125				
1,2,3-Trichlorobenzene	21.56	1.0	20	0	108	69 - 129				
1,2,3-Trichloropropane	20.6	1.0	20	0	103	73 - 122				
1,2,4-Trichlorobenzene	21.14	1.0	20	0	106	69 - 130				
1,2,4-Trimethylbenzene	21.8	1.0	20	0	109	76 - 124				
1,2-Dibromo-3-chloropropane	18.45	1.0	20	0	92.3	62 - 128				
1,2-Dibromoethane	20.14	1.0	20	0	101	77 - 121				
1,2-Dichlorobenzene	21.19	1.0	20	0	106	80 - 119				
1,2-Dichloroethane	19.65	1.0	20	0	98.2	73 - 128				
1,2-Dichloropropane	20.18	1.0	20	0	101	78 - 122				
1,3,5-Trimethylbenzene	21.91	1.0	20	0	110	75 - 124				
1,3-Dichlorobenzene	21.57	1.0	20	0	108	80 - 119				
1,3-Dichloropropane	20.31	1.0	20	0	102	80 - 119				
1,4-Dichlorobenzene	21.4	1.0	20	0	107	79 - 118				
2,2-Dichloropropane	19.52	1.0	20	0	97.6	60 - 139				
2-Butanone	33.35	2.0	40	0	83.4	56 - 143				
2-Chlorotoluene	21.26	1.0	20	0	106	79 - 122				
2-Hexanone	40.15	2.0	40	0	100	57 - 139				
4-Chlorotoluene	21.88	1.0	20	0	109	78 - 122				
4-Isopropyltoluene	22.74	1.0	20	0	114	77 - 127				
4-Methyl-2-pentanone	40.38	2.0	40	0	101	67 - 130				
Acetone	29.19	2.0	40	0	73.0	39 - 160				
Benzene	20.19	1.0	20	0	101	79 - 120				
Bromobenzene	21.75	1.0	20	0	109	80 - 120				
Bromochloromethane	19.3	1.0	20	0	96.5	78 - 123				
Bromodichloromethane	19.17	1.0	20	0	95.9	79 - 125				
Bromoform	19.83	1.0	20	0	99.1	66 - 130				
Bromomethane	16.21	1.0	20	0	81.1	53 - 141				

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS22060604-04MS** Units: **ug/L** Analysis Date: **13-Jun-2022 15:27**
Client ID: Run ID: **VOA6_410539** SeqNo: **6690152** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	37.73	2.0	40	0	94.3	64 - 133				
Carbon tetrachloride	19.81	1.0	20	0	99.0	72 - 136				
Chlorobenzene	20.97	1.0	20	0	105	82 - 118				
Chloroethane	18.35	1.0	20	0	91.8	60 - 138				
Chloroform	18.73	1.0	20	0	93.6	79 - 124				
Chloromethane	16.18	1.0	20	0	80.9	50 - 139				
cis-1,2-Dichloroethene	19.89	1.0	20	0	99.5	78 - 123				
cis-1,3-Dichloropropene	19.61	1.0	20	0	98.1	75 - 124				
Dibromochloromethane	20.21	1.0	20	0	101	74 - 126				
Dibromomethane	19.41	1.0	20	0	97.1	79 - 123				
Dichlorodifluoromethane	10.64	1.0	20	0	53.2	32 - 152				
Ethylbenzene	21.31	1.0	20	0	107	79 - 121				
Hexachlorobutadiene	21.27	1.0	20	0	106	66 - 134				
Isopropylbenzene	20.55	1.0	20	0	103	72 - 131				
m,p-Xylene	41.88	2.0	40	0	105	80 - 121				
Methylene chloride	17.48	2.0	20	0	87.4	74 - 124				
Naphthalene	20.02	1.0	20	0	100	61 - 128				
n-Butylbenzene	22.15	1.0	20	0	111	75 - 128				
n-Propylbenzene	22.34	1.0	20	0	112	76 - 126				
o-Xylene	21.05	1.0	20	0	105	78 - 122				
sec-Butylbenzene	22.23	1.0	20	0	111	77 - 126				
Styrene	20.92	1.0	20	0	105	78 - 123				
tert-Butylbenzene	22.56	1.0	20	0	113	78 - 124				
Tetrachloroethene	20.92	1.0	20	0	105	74 - 129				
Toluene	21.07	1.0	20	0	105	80 - 121				
trans-1,2-Dichloroethene	19.63	1.0	20	0	98.1	75 - 124				
trans-1,3-Dichloropropene	19.24	1.0	20	0	96.2	73 - 127				
Trichloroethene	20.44	1.0	20	0	102	79 - 123				
Trichlorofluoromethane	17.46	1.0	20	0	87.3	65 - 141				
Vinyl chloride	16.18	1.0	20	0	80.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*44.8*	*1.0*	*50*	*0*	*89.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.67*	*1.0*	*50*	*0*	*97.3*	*85 - 114*				
Surr: Dibromofluoromethane	*46.83*	*1.0*	*50*	*0*	*93.7*	*80 - 119*				
Surr: Toluene-d8	*50.2*	*1.0*	*50*	*0*	*100*	*89 - 112*				

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS22060604-03MS** Units: **ug/L** Analysis Date: **13-Jun-2022 14:44**
Client ID: Run ID: **VOA6_410539** SeqNo: **6690150** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.17	1.0	20	0	101	78 - 124				
1,1,1-Trichloroethane	19.21	1.0	20	0	96.0	74 - 131				
1,1,2,2-Tetrachloroethane	19.88	1.0	20	0	99.4	71 - 121				
1,1,2-Trichloroethane	19.5	1.0	20	0	97.5	80 - 119				
1,1-Dichloroethane	19.79	1.0	20	0	99.0	77 - 125				
1,1-Dichloroethene	18.47	1.0	20	0	92.3	71 - 131				
1,1-Dichloropropene	20.37	1.0	20	0	102	78 - 125				
1,2,3-Trichlorobenzene	15.73	1.0	20	0	78.6	69 - 129				
1,2,3-Trichloropropane	20.93	1.0	20	0	105	73 - 122				
1,2,4-Trichlorobenzene	18.15	1.0	20	0	90.7	69 - 130				
1,2,4-Trimethylbenzene	21.73	1.0	20	0	109	76 - 124				
1,2-Dibromo-3-chloropropane	15.62	1.0	20	0	78.1	62 - 128				
1,2-Dibromoethane	19.13	1.0	20	0	95.7	77 - 121				
1,2-Dichlorobenzene	20.99	1.0	20	0	105	80 - 119				
1,2-Dichloroethane	18.91	1.0	20	0	94.6	73 - 128				
1,2-Dichloropropane	19.97	1.0	20	0	99.8	78 - 122				
1,3,5-Trimethylbenzene	22.15	1.0	20	0	111	75 - 124				
1,3-Dichlorobenzene	21.17	1.0	20	0	106	80 - 119				
1,3-Dichloropropane	19.71	1.0	20	0	98.5	80 - 119				
1,4-Dichlorobenzene	21.33	1.0	20	0	107	79 - 118				
2,2-Dichloropropane	20.09	1.0	20	0	100	60 - 139				
2-Butanone	29.73	2.0	40	0	74.3	56 - 143				
2-Chlorotoluene	21.53	1.0	20	0	108	79 - 122				
2-Hexanone	35.89	2.0	40	0	89.7	57 - 139				
4-Chlorotoluene	21.74	1.0	20	0	109	78 - 122				
4-Isopropyltoluene	22.93	1.0	20	0	115	77 - 127				
4-Methyl-2-pentanone	36.85	2.0	40	0	92.1	67 - 130				
Acetone	25.27	2.0	40	0	63.2	39 - 160				
Benzene	20.2	1.0	20	0	101	79 - 120				
Bromobenzene	21.84	1.0	20	0	109	80 - 120				
Bromochloromethane	19.02	1.0	20	0	95.1	78 - 123				
Bromodichloromethane	18.86	1.0	20	0	94.3	79 - 125				
Bromoform	18.81	1.0	20	0	94.1	66 - 130				
Bromomethane	17.15	1.0	20	0	85.7	53 - 141				

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS22060604-03MS** Units: **ug/L** Analysis Date: **13-Jun-2022 14:44**
Client ID: Run ID: **VOA6_410539** SeqNo: **6690150** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	38.33	2.0	40	0	95.8	64 - 133				
Carbon tetrachloride	19.54	1.0	20	0	97.7	72 - 136				
Chlorobenzene	20.69	1.0	20	0	103	82 - 118				
Chloroethane	17.88	1.0	20	0	89.4	60 - 138				
Chloroform	18.84	1.0	20	0	94.2	79 - 124				
Chloromethane	16.53	1.0	20	0	82.7	50 - 139				
cis-1,2-Dichloroethene	19.73	1.0	20	0	98.7	78 - 123				
cis-1,3-Dichloropropene	19.37	1.0	20	0	96.8	75 - 124				
Dibromochloromethane	19.88	1.0	20	0	99.4	74 - 126				
Dibromomethane	19.04	1.0	20	0	95.2	79 - 123				
Dichlorodifluoromethane	11.32	1.0	20	0	56.6	32 - 152				
Ethylbenzene	21.33	1.0	20	0	107	79 - 121				
Hexachlorobutadiene	21.48	1.0	20	0	107	66 - 134				
Isopropylbenzene	20.58	1.0	20	0	103	72 - 131				
m,p-Xylene	42.27	2.0	40	0	106	80 - 121				
Methylene chloride	17.67	2.0	20	0	88.4	74 - 124				
Naphthalene	14.07	1.0	20	0	70.4	61 - 128				
n-Butylbenzene	22.42	1.0	20	0	112	75 - 128				
n-Propylbenzene	22.54	1.0	20	0	113	76 - 126				
o-Xylene	21.07	1.0	20	0	105	78 - 122				
sec-Butylbenzene	22.5	1.0	20	0	113	77 - 126				
Styrene	20.58	1.0	20	0	103	78 - 123				
tert-Butylbenzene	22.8	1.0	20	0	114	78 - 124				
Tetrachloroethene	21.56	1.0	20	0	108	74 - 129				
Toluene	21.11	1.0	20	0	106	80 - 121				
trans-1,2-Dichloroethene	19.77	1.0	20	0	98.8	75 - 124				
trans-1,3-Dichloropropene	18.9	1.0	20	0	94.5	73 - 127				
Trichloroethene	20.36	1.0	20	0	102	79 - 123				
Trichlorofluoromethane	18.12	1.0	20	0	90.6	65 - 141				
Vinyl chloride	16.64	1.0	20	0	83.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.04*	*1.0*	*50*	*0*	*92.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.54*	*1.0*	*50*	*0*	*97.1*	*85 - 114*				
Surr: Dibromofluoromethane	*47.1*	*1.0*	*50*	*0*	*94.2*	*80 - 119*				
Surr: Toluene-d8	*49.96*	*1.0*	*50*	*0*	*99.9*	*89 - 112*				

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS22060604-04MSD** Units: **ug/L** Analysis Date: **13-Jun-2022 15:48**
Client ID: Run ID: **VOA6_410539** SeqNo: **6690153** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.92	1.0	20	0	99.6	78 - 124	20.81	4.38	20	
1,1,1-Trichloroethane	18.51	1.0	20	0	92.5	74 - 131	19.04	2.83	20	
1,1,2,2-Tetrachloroethane	20.89	1.0	20	0	104	71 - 121	20.98	0.442	20	
1,1,2-Trichloroethane	19.01	1.0	20	0	95.1	80 - 119	20.03	5.23	20	
1,1-Dichloroethane	19.2	1.0	20	0	96.0	77 - 125	19.68	2.44	20	
1,1-Dichloroethene	17.06	1.0	20	0	85.3	71 - 131	17.72	3.75	20	
1,1-Dichloropropene	18.93	1.0	20	0	94.7	78 - 125	20.14	6.16	20	
1,2,3-Trichlorobenzene	21.36	1.0	20	0	107	69 - 129	21.56	0.958	20	
1,2,3-Trichloropropane	19.23	1.0	20	0	96.2	73 - 122	20.6	6.86	20	
1,2,4-Trichlorobenzene	20.37	1.0	20	0	102	69 - 130	21.14	3.71	20	
1,2,4-Trimethylbenzene	21.37	1.0	20	0	107	76 - 124	21.8	2	20	
1,2-Dibromo-3-chloropropane	18.73	1.0	20	0	93.7	62 - 128	18.45	1.5	20	
1,2-Dibromoethane	19.46	1.0	20	0	97.3	77 - 121	20.14	3.41	20	
1,2-Dichlorobenzene	21.1	1.0	20	0	106	80 - 119	21.19	0.434	20	
1,2-Dichloroethane	19.18	1.0	20	0	95.9	73 - 128	19.65	2.41	20	
1,2-Dichloropropane	19.4	1.0	20	0	97.0	78 - 122	20.18	3.93	20	
1,3,5-Trimethylbenzene	21.36	1.0	20	0	107	75 - 124	21.91	2.55	20	
1,3-Dichlorobenzene	21.04	1.0	20	0	105	80 - 119	21.57	2.51	20	
1,3-Dichloropropane	19.4	1.0	20	0	97.0	80 - 119	20.31	4.57	20	
1,4-Dichlorobenzene	21.01	1.0	20	0	105	79 - 118	21.4	1.85	20	
2,2-Dichloropropane	18.71	1.0	20	0	93.6	60 - 139	19.52	4.24	20	
2-Butanone	31.94	2.0	40	0	79.9	56 - 143	33.35	4.3	20	
2-Chlorotoluene	20.85	1.0	20	0	104	79 - 122	21.26	1.94	20	
2-Hexanone	40.11	2.0	40	0	100	57 - 139	40.15	0.088	20	
4-Chlorotoluene	21.12	1.0	20	0	106	78 - 122	21.88	3.55	20	
4-Isopropyltoluene	21.84	1.0	20	0	109	77 - 127	22.74	4.07	20	
4-Methyl-2-pentanone	39.22	2.0	40	0	98.1	67 - 130	40.38	2.9	20	
Acetone	29.23	2.0	40	0	73.1	39 - 160	29.19	0.13	20	
Benzene	19.59	1.0	20	0	97.9	79 - 120	20.19	3.01	20	
Bromobenzene	21.58	1.0	20	0	108	80 - 120	21.75	0.758	20	
Bromochloromethane	18.92	1.0	20	0	94.6	78 - 123	19.3	2.01	20	
Bromodichloromethane	18.53	1.0	20	0	92.7	79 - 125	19.17	3.42	20	
Bromoform	19.05	1.0	20	0	95.2	66 - 130	19.83	4.01	20	
Bromomethane	15.19	1.0	20	0	75.9	53 - 141	16.21	6.55	20	

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22060604-04MSD** Units: **ug/L** Analysis Date: **13-Jun-2022 15:48**
Client ID: Run ID: **VOA6_410539** SeqNo: **6690153** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	36.16	2.0	40	0	90.4	64 - 133	37.73	4.27	20	
Carbon tetrachloride	18.74	1.0	20	0	93.7	72 - 136	19.81	5.52	20	
Chlorobenzene	19.89	1.0	20	0	99.5	82 - 118	20.97	5.27	20	
Chloroethane	17.79	1.0	20	0	88.9	60 - 138	18.35	3.13	20	
Chloroform	18.24	1.0	20	0	91.2	79 - 124	18.73	2.64	20	
Chloromethane	15.63	1.0	20	0	78.2	50 - 139	16.18	3.43	20	
cis-1,2-Dichloroethene	19.29	1.0	20	0	96.4	78 - 123	19.89	3.08	20	
cis-1,3-Dichloropropene	18.97	1.0	20	0	94.9	75 - 124	19.61	3.31	20	
Dibromochloromethane	19.43	1.0	20	0	97.2	74 - 126	20.21	3.92	20	
Dibromomethane	18.76	1.0	20	0	93.8	79 - 123	19.41	3.39	20	
Dichlorodifluoromethane	10.04	1.0	20	0	50.2	32 - 152	10.64	5.78	20	
Ethylbenzene	20.33	1.0	20	0	102	79 - 121	21.31	4.69	20	
Hexachlorobutadiene	20.63	1.0	20	0	103	66 - 134	21.27	3.06	20	
Isopropylbenzene	19.24	1.0	20	0	96.2	72 - 131	20.55	6.61	20	
m,p-Xylene	40.22	2.0	40	0	101	80 - 121	41.88	4.06	20	
Methylene chloride	17.01	2.0	20	0	85.1	74 - 124	17.48	2.73	20	
Naphthalene	21.06	1.0	20	0	105	61 - 128	20.02	5.04	20	
n-Butylbenzene	20.83	1.0	20	0	104	75 - 128	22.15	6.15	20	
n-Propylbenzene	21.54	1.0	20	0	108	76 - 126	22.34	3.62	20	
o-Xylene	20.1	1.0	20	0	100	78 - 122	21.05	4.64	20	
sec-Butylbenzene	21.38	1.0	20	0	107	77 - 126	22.23	3.92	20	
Styrene	19.91	1.0	20	0	99.6	78 - 123	20.92	4.94	20	
tert-Butylbenzene	21.94	1.0	20	0	110	78 - 124	22.56	2.78	20	
Tetrachloroethene	19.72	1.0	20	0	98.6	74 - 129	20.92	5.94	20	
Toluene	20.06	1.0	20	0	100	80 - 121	21.07	4.93	20	
trans-1,2-Dichloroethene	18.87	1.0	20	0	94.4	75 - 124	19.63	3.92	20	
trans-1,3-Dichloropropene	18.48	1.0	20	0	92.4	73 - 127	19.24	4.02	20	
Trichloroethene	19.46	1.0	20	0	97.3	79 - 123	20.44	4.91	20	
Trichlorofluoromethane	16.48	1.0	20	0	82.4	65 - 141	17.46	5.77	20	
Vinyl chloride	15.54	1.0	20	0	77.7	58 - 137	16.18	4.03	20	
Surr: 1,2-Dichloroethane-d4	*45.29*	*1.0*	*50*	*0*	*90.6*	*81 - 118*	*44.8*	*1.1*	*20*	
Surr: 4-Bromofluorobenzene	*48.05*	*1.0*	*50*	*0*	*96.1*	*85 - 114*	*48.67*	*1.29*	*20*	
Surr: Dibromofluoromethane	*47.18*	*1.0*	*50*	*0*	*94.4*	*80 - 119*	*46.83*	*0.749*	*20*	
Surr: Toluene-d8	*50.29*	*1.0*	*50*	*0*	*101*	*89 - 112*	*50.2*	*0.168*	*20*	

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22060604-03MSD** Units: **ug/L** Analysis Date: **13-Jun-2022 15:05**
Client ID: Run ID: **VOA6_410539** SeqNo: **6690151** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.55	1.0	20	0	97.8	78 - 124	20.17	3.12	20	
1,1,1-Trichloroethane	18.63	1.0	20	0	93.2	74 - 131	19.21	3.04	20	
1,1,2,2-Tetrachloroethane	19.11	1.0	20	0	95.5	71 - 121	19.88	3.98	20	
1,1,2-Trichloroethane	19.07	1.0	20	0	95.4	80 - 119	19.5	2.19	20	
1,1-Dichloroethane	19.14	1.0	20	0	95.7	77 - 125	19.79	3.37	20	
1,1-Dichloroethene	17.76	1.0	20	0	88.8	71 - 131	18.47	3.92	20	
1,1-Dichloropropene	19.52	1.0	20	0	97.6	78 - 125	20.37	4.28	20	
1,2,3-Trichlorobenzene	18.77	1.0	20	0	93.8	69 - 129	15.73	17.6	20	
1,2,3-Trichloropropane	18.98	1.0	20	0	94.9	73 - 122	20.93	9.77	20	
1,2,4-Trichlorobenzene	18.58	1.0	20	0	92.9	69 - 130	18.15	2.37	20	
1,2,4-Trimethylbenzene	20.62	1.0	20	0	103	76 - 124	21.73	5.25	20	
1,2-Dibromo-3-chloropropane	16.27	1.0	20	0	81.4	62 - 128	15.62	4.05	20	
1,2-Dibromoethane	19.18	1.0	20	0	95.9	77 - 121	19.13	0.265	20	
1,2-Dichlorobenzene	20.17	1.0	20	0	101	80 - 119	20.99	4	20	
1,2-Dichloroethane	19.51	1.0	20	0	97.5	73 - 128	18.91	3.11	20	
1,2-Dichloropropane	19.84	1.0	20	0	99.2	78 - 122	19.97	0.62	20	
1,3,5-Trimethylbenzene	20.76	1.0	20	0	104	75 - 124	22.15	6.48	20	
1,3-Dichlorobenzene	20.1	1.0	20	0	101	80 - 119	21.17	5.19	20	
1,3-Dichloropropane	19.26	1.0	20	0	96.3	80 - 119	19.71	2.31	20	
1,4-Dichlorobenzene	20.35	1.0	20	0	102	79 - 118	21.33	4.66	20	
2,2-Dichloropropane	19.08	1.0	20	0	95.4	60 - 139	20.09	5.16	20	
2-Butanone	31.96	2.0	40	0	79.9	56 - 143	29.73	7.23	20	
2-Chlorotoluene	20.01	1.0	20	0	100	79 - 122	21.53	7.3	20	
2-Hexanone	36.17	2.0	40	0	90.4	57 - 139	35.89	0.778	20	
4-Chlorotoluene	20.41	1.0	20	0	102	78 - 122	21.74	6.27	20	
4-Isopropyltoluene	21.46	1.0	20	0	107	77 - 127	22.93	6.67	20	
4-Methyl-2-pentanone	36.38	2.0	40	0	91.0	67 - 130	36.85	1.27	20	
Acetone	25.69	2.0	40	0	64.2	39 - 160	25.27	1.66	20	
Benzene	19.77	1.0	20	0	98.8	79 - 120	20.2	2.14	20	
Bromobenzene	20.61	1.0	20	0	103	80 - 120	21.84	5.78	20	
Bromochloromethane	18.51	1.0	20	0	92.5	78 - 123	19.02	2.75	20	
Bromodichloromethane	18.5	1.0	20	0	92.5	79 - 125	18.86	1.94	20	
Bromoform	18.65	1.0	20	0	93.3	66 - 130	18.81	0.856	20	
Bromomethane	15.98	1.0	20	0	79.9	53 - 141	17.15	7.05	20	

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS22060604-03MSD** Units: **ug/L** Analysis Date: **13-Jun-2022 15:05**
Client ID: Run ID: **VOA6_410539** SeqNo: **6690151** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	36.82	2.0	40	0	92.0	64 - 133	38.33	4.03	20	
Carbon tetrachloride	18.69	1.0	20	0	93.4	72 - 136	19.54	4.43	20	
Chlorobenzene	19.91	1.0	20	0	99.6	82 - 118	20.69	3.83	20	
Chloroethane	17.68	1.0	20	0	88.4	60 - 138	17.88	1.14	20	
Chloroform	18.39	1.0	20	0	92.0	79 - 124	18.84	2.38	20	
Chloromethane	16.08	1.0	20	0	80.4	50 - 139	16.53	2.78	20	
cis-1,2-Dichloroethene	19.68	1.0	20	0	98.4	78 - 123	19.73	0.274	20	
cis-1,3-Dichloropropene	19.04	1.0	20	0	95.2	75 - 124	19.37	1.7	20	
Dibromochloromethane	19.09	1.0	20	0	95.5	74 - 126	19.88	4.02	20	
Dibromomethane	18.75	1.0	20	0	93.7	79 - 123	19.04	1.56	20	
Dichlorodifluoromethane	10.53	1.0	20	0	52.7	32 - 152	11.32	7.21	20	
Ethylbenzene	20.18	1.0	20	0	101	79 - 121	21.33	5.5	20	
Hexachlorobutadiene	20.57	1.0	20	0	103	66 - 134	21.48	4.32	20	
Isopropylbenzene	19.64	1.0	20	0	98.2	72 - 131	20.58	4.65	20	
m,p-Xylene	40.01	2.0	40	0	100	80 - 121	42.27	5.5	20	
Methylene chloride	17.47	2.0	20	0	87.3	74 - 124	17.67	1.16	20	
Naphthalene	16.98	1.0	20	0	84.9	61 - 128	14.07	18.7	20	
n-Butylbenzene	21.08	1.0	20	0	105	75 - 128	22.42	6.17	20	
n-Propylbenzene	21	1.0	20	0	105	76 - 126	22.54	7.08	20	
o-Xylene	20.22	1.0	20	0	101	78 - 122	21.07	4.13	20	
sec-Butylbenzene	20.86	1.0	20	0	104	77 - 126	22.5	7.59	20	
Styrene	19.85	1.0	20	0	99.2	78 - 123	20.58	3.62	20	
tert-Butylbenzene	21.35	1.0	20	0	107	78 - 124	22.8	6.59	20	
Tetrachloroethene	20.34	1.0	20	0	102	74 - 129	21.56	5.81	20	
Toluene	20.19	1.0	20	0	101	80 - 121	21.11	4.44	20	
trans-1,2-Dichloroethene	19.34	1.0	20	0	96.7	75 - 124	19.77	2.17	20	
trans-1,3-Dichloropropene	18.78	1.0	20	0	93.9	73 - 127	18.9	0.649	20	
Trichloroethene	19.78	1.0	20	0	98.9	79 - 123	20.36	2.88	20	
Trichlorofluoromethane	17.15	1.0	20	0	85.7	65 - 141	18.12	5.52	20	
Vinyl chloride	16.14	1.0	20	0	80.7	58 - 137	16.64	3.04	20	
Surr: 1,2-Dichloroethane-d4	*46.3*	*1.0*	*50*	*0*	*92.6*	*81 - 118*	*46.04*	*0.55*	*20*	
Surr: 4-Bromofluorobenzene	*49.72*	*1.0*	*50*	*0*	*99.4*	*85 - 114*	*48.54*	*2.4*	*20*	
Surr: Dibromofluoromethane	*47.17*	*1.0*	*50*	*0*	*94.3*	*80 - 119*	*47.1*	*0.16*	*20*	
Surr: Toluene-d8	*49.33*	*1.0*	*50*	*0*	*98.7*	*89 - 112*	*49.96*	*1.27*	*20*	

ALS Houston, US Date: 30-Jun-22

Client:	Bhate Environmental Associates, Inc.
Project:	LHAAP-58
WorkOrder:	HS22060453

QC BATCH REPORT

Batch ID:	**R410539 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS22060453-05 HS22060453-09

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R410358 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **09-Jun-2022 15:42**
Client ID: Run ID: **ICS-Integrion_410358** SeqNo: **6686258** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.500	0.500								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Nitrogen, Nitrite (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS** Units: **mg/L** Analysis Date: **09-Jun-2022 15:47**
Client ID: Run ID: **ICS-Integrion_410358** SeqNo: **6686259** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.46	0.500	20	0	97.3	80 - 120				
Nitrogen, Nitrate (As N)	4.086	0.100	4	0	102	80 - 120				
Nitrogen, Nitrite (As N)	4.364	0.100	4	0	109	80 - 120				
Sulfate	19.31	0.500	20	0	96.5	80 - 120				

MS Sample ID: **HS22060453-01MS** Units: **mg/L** Analysis Date: **09-Jun-2022 15:58**
Client ID: **35AWW19_060822** Run ID: **ICS-Integrion_410358** SeqNo: **6686306** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	531.4	0.500	10	548	-166	80 - 120				SEO
Nitrogen, Nitrate (As N)	2.105	0.100	2	0.0352	104	80 - 120				
Nitrogen, Nitrite (As N)	1.699	0.100	2	0	85.0	80 - 120				
Sulfate	634.4	0.500	10	655.6	-212	80 - 120				SEO

MSD Sample ID: **HS22060453-01MSD** Units: **mg/L** Analysis Date: **09-Jun-2022 16:03**
Client ID: **35AWW19_060822** Run ID: **ICS-Integrion_410358** SeqNo: **6686307** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	531.5	0.500	10	548	-165	80 - 120	531.4	0.00941	20	SEO
Nitrogen, Nitrate (As N)	2.093	0.100	2	0.0352	103	80 - 120	2.105	0.576	20	
Nitrogen, Nitrite (As N)	1.692	0.100	2	0	84.6	80 - 120	1.699	0.448	20	
Sulfate	635.3	0.500	10	655.6	-203	80 - 120	634.4	0.142	20	SEO

The following samples were analyzed in this batch: HS22060453-01 HS22060453-02 HS22060453-03 HS22060453-04 HS22060453-05 HS22060453-06

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R411032 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON BY E415.1**

MBLK Sample ID: **MBLK-06172022** Units: **mg/L** Analysis Date: **17-Jun-2022 22:13**
Client ID: Run ID: **TOC_04_411032** SeqNo: **6701996** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **LCS-06172022** Units: **mg/L** Analysis Date: **17-Jun-2022 22:25**
Client ID: Run ID: **TOC_04_411032** SeqNo: **6701997** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.955	1.00	10	0	99.6	85 - 115				

LCSD Sample ID: **LCSD-06172022** Units: **mg/L** Analysis Date: **17-Jun-2022 22:36**
Client ID: Run ID: **TOC_04_411032** SeqNo: **6701998** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10	1.00	10	0	100	85 - 115	9.955	0.451	20	

MS Sample ID: **HS22060410-02MS** Units: **mg/L** Analysis Date: **17-Jun-2022 23:00**
Client ID: Run ID: **TOC_04_411032** SeqNo: **6702000** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	25.75	1.00	10	15.77	99.8	80 - 120				

The following samples were analyzed in this batch: HS22060453-01 HS22060453-02 HS22060453-03

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060453

QC BATCH REPORT

Batch ID: R411152 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON BY E415.1**

MBLK Sample ID: **MBLK-06202022** Units: **mg/L** Analysis Date: **21-Jun-2022 01:58**
Client ID: Run ID: **TOC_04_411152** SeqNo: **6704603** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **LCS-06202022** Units: **mg/L** Analysis Date: **21-Jun-2022 02:09**
Client ID: Run ID: **TOC_04_411152** SeqNo: **6704604** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.03	1.00	10	0	100	85 - 115				

LCSD Sample ID: **LCSD-06202022** Units: **mg/L** Analysis Date: **21-Jun-2022 02:21**
Client ID: Run ID: **TOC_04_411152** SeqNo: **6704605** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.04	1.00	10	0	100	85 - 115	10.03	0.0997	20	

MS Sample ID: **HS22060773-01MS** Units: **mg/L** Analysis Date: **21-Jun-2022 02:56**
Client ID: Run ID: **TOC_04_411152** SeqNo: **6704608** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	27.83	1.00	10	17.76	101	80 - 120				

The following samples were analyzed in this batch: HS22060453-04 HS22060453-05 HS22060453-06

ALS Houston, US Date: 30-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: **HS22060453**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

ALS Houston, US Date: 30-Jun-22

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
California	2919 2022-2023	30-Apr-2023
Dept of Defense	L21-682	31-Dec-2023
Illinois	2000322022-9	09-May-2023
Kansas	E-10352 2021-2022	31-Jul-2022
Kentucky	123043, 2022-2023	30-Apr-2023
Maryland	343, 2022-2023	30-Jun-2023
North Carolina	624-2022	31-Dec-2022
North Dakota	R-193 2022-2023	30-Apr-2023
Oklahoma	2021-080	31-Aug-2022
Texas	T104704231-22-29	30-Apr-2023
Utah	TX026932021-12	30-Jul-2022

ALS Houston, US Date: 30-Jun-22

Sample Receipt Checklist

Work Order ID: HS22060453 **Date/Time Received:** 09-Jun-2022 09:45

Client Name: Bhate Environmental **Received by:** Pablo Marinez

Completed By: /S/ Nilesh D. Ranchod (eSignature) 09-Jun-2022 12:48 (Date/Time) **Reviewed by:** /S/ Dane J. Wacasey (eSignature) 13-Jun-2022 11:14 (Date/Time)

Matrices: **Water** Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	0.6C/1.1C UC/C	IR31
Cooler(s)/Kit(s):	46335	
Date/Time sample(s) sent to storage:	06/09/2022 13:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

bhate

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: _____ of _____

Project/Phase No: NWO1312.0150

COC Number(1): _____

LIMS Number: _____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 58

Client Name:

Collected by: Scott Beesinger

Sample Analysis Requested [5] | Quality Assurance Samples [6]

Field Sample ID (30 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code [1]	Sample Number [3]	Sample Matrix [4]	Number of containers	VOC	MEE	TOC	Carbon Dioxide	Anions	Arsenic					Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
35AWW19_060822	08 JUN 2022	0715	-	N		WG	12	X	X	X	X	X									
35AWW23_060822	08 JUN 2022	0805	-	N		WG	12	X	X	X	X	X									
35AWW06_060822	08 JUN 2022	0900	-	N		WG	12	X	X	X	X	X									
LHSMW07_060822	08 JUN 2022	0950		N		WG	12	X	X	X	X	X									
35AWW20_060822	08 JUN 2022	1045		N		WG	12	X	X	X	X	X	X								
35AWW11_060822	08 JUN 2022	1140	-	N		WG	12	X	X	X	X	X									
35AWW24_060822	08 JUN 2022	1235	-	N		WG	3	X													
35AWW24_060822_a	08 JUN 2022	1235	-	FD		WG	3	X													
TRIP BLANK	08 JUN 2022		-	TB		W	2	X													
			-																		
			-																		

COMMENTS: STANDARD TAT

HS2206453

Bhate Environmental Associates, Inc.
LHAAP / Site 58

Custody Transfers Prior to Receipt by Laboratory

	Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1.	Scott Beesinger	6/8/22	1400		6/9/22	0945
2.						46335
3.						06C iR31 LP05

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: _____ Shipped No.:

_____ Method of Shipment: _____

_____ Fed Ex _____ Airbill Number:

_____ Analytical Lab: ALS 10450 Stanciff Rd, Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: Dane Wacasey Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

01154667

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

U6335

CUSTODY SEAL

Date: 6/8/22 Time: 1430
Name: Scott Beesinger
Company: BHATE

Seal Broken By:

6/10/22

U6335 JUN 0 9 2022

Part # 1524428-004-ACTIV/EXP 12/22

ALS

U6335

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 25MAY22
ACTWGT: 1.00 LB MAN
CAD: 0321247/CAFE3512
DIMS: 26x14x14 IN

TO SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-58-BD 85517-DW

RMA:

FedEx Express

FedEx TRK# 0221 5300 5231 9618

THU - 09 JUN AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

Pace Analytical®

LELAP CERTIFICATE NUMBER: 01955
DOD-ELAP ACCREDITATION NUMBER: 74960

ANALYTICAL RESULTS

PERFORMED BY

Pace Analytical Gulf Coast
7979 Innovation Park Dr.
Baton Rouge, LA 70820
(225) 769-4900

Report Date 06/28/2022

Report # 222061111

Project HS22060453

Samples Collected 6/8/22

Deliver To	***Additional Recipients***
Dane Wacasey ALS 10450 Stancliff Rd., Ste 210 Houston, TX 770994338	Jumoke Lawal, ALS Houston

PJLA Testing DoD ELAP

ISO 17025

NELAP ACCREDITED TNI LABORATORY

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with Pace Gulf Coast's Standard Operating Procedures.

Common Abbreviations that may be Utilized in this Report

ND	Indicates the result was Not Detected at the specified reporting limit
NO	Indicates the sample did not ignite when preliminary test performed for EPA Method 1030
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
DL	Detection Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
RE	Re-analysis
CF	HPLC or GC Confirmation
00:01	Reported as a time equivalent to 12:00 AM

Reporting Flags that may be Utilized in this Report

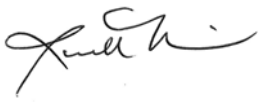
J or I	Indicates the result is between the MDL and LOQ
J	DOD flag on analyte in the parent sample for MS/MSD outside acceptance criteria
U	Indicates the compound was analyzed for but not detected
B or V	Indicates the analyte was detected in the associated Method Blank
Q	Indicates a non-compliant QC Result (See Q Flag Application Report)
*****	Indicates a non-compliant or not applicable QC recovery or RPD – see narrative
E	Organics - The result is estimated because it exceeded the instrument calibration range
E	Metals - % diference for the serial dilution is > 10%
L	Reporting Limits adjusted to meet risk-based limit.
P	RPD between primary and confirmation result is greater than 40
DL	Diluted analysis – when appended to Client Sample ID

Sample receipt at Pace Gulf Coast is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of Pace Gulf Coast. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with The NELAC Institute (TNI) Standard 2009 and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.



Authorized Signature
Pace Gulf Coast Report 222061111

Certifications

Certification	Certification Number
DOD ELAP	74960
Alabama	01955
Arkansas	88-0655
Colorado	01955
Delaware	01955
Florida	E87854
Georgia	01955
Hawaii	01955
Idaho	01955
Illinois	200048
Indiana	01955
Kansas	E-10354
Kentucky	95
Louisiana	01955
Maryland	01955
Massachusetts	01955
Michigan	01955
Mississippi	01955
Missouri	01955
Montana	N/A
Nebraska	01955
New Mexico	01955
North Carolina	618
North Dakota	R-195
Oklahoma	9403
South Carolina	73006001
South Dakota	01955
Tennessee	01955
Texas	T104704178
Vermont	01955
Virginia	460215
Washington	C929
USDA Soil Permit	P330-16-00234

Case Narrative

Client: ALS Environmental - Houston, TX **Report:** 222061111

Pace Analytical Gulf Coast received and analyzed the sample(s) listed
on the Report Sample Summary page of this report. Receipt of the sample(s) is documented
by the attached chain of custody. This applies only to the sample(s) listed in this report.
No sample integrity or quality control exceptions were identified unless noted below.

This report was completed in accordance with DOD QSM 5.3 as specified in the contract.

No anomalies were found for the analyzed sample(s).

Sample Summary

Lab ID	Client ID	Matrix	Collect Date	Receive Date
22206111101	35AWW19_060822	Water	6/08/22 07:15	6/10/22 08:28
22206111102	35AWW23_060822	Water	6/08/22 08:05	6/10/22 08:28
22206111103	35AWW06_060822	Water	6/08/22 09:00	6/10/22 08:28
22206111104	LHSMW07_060822	Water	6/08/22 09:50	6/10/22 08:28
22206111105	35AWW20_060822	Water	6/08/22 10:45	6/10/22 08:28
22206111106	35AWW11_060822	Water	6/08/22 11:40	6/10/22 08:28

Test Summary

EPA RSK-175					
Lab ID	**Client ID**	**Matrix**	**Batch**	**Instru**	**RunDate**
22206111101	35AWW19_060822	Water	743215	GCV8B	6/14/22 15:10
22206111102	35AWW23_060822	Water	743215	GCV8B	6/14/22 15:24
22206111103	35AWW06_060822	Water	743215	GCV8B	6/14/22 15:30
22206111104	LHSMW07_060822	Water	743215	GCV8B	6/14/22 15:35
22206111105	35AWW20_060822	Water	743215	GCV8B	6/14/22 15:41
22206111106	35AWW11_060822	Water	743215	GCV8B	6/14/22 15:52

Manual Integrations

Manual Integrations for LC and IC (if performed) are documented in the raw data.
No other manual integrations were performed by Pace Gulf Coast.

Q Flag Summary

NO Q FLAGS FOR THIS WORKORDER

Detect Summary

Results and Detection Limits are adjusted for dilution and moisture when applicable

EPA RSK-175						
Lab ID	**Client ID**	**Parameter**	**Units**	**Result**	**Dil.**	**%Moist**
22206111101	35AWW19_060822	Carbon Dioxide	ug/L	520000	50	NA
22206111102	35AWW23_060822	Carbon Dioxide	ug/L	520000	50	NA
22206111103	35AWW06_060822	Carbon Dioxide	ug/L	391000	50	NA
22206111104	LHSMW07_060822	Carbon Dioxide	ug/L	173000	50	NA
22206111105	35AWW20_060822	Carbon Dioxide	ug/L	458000	50	NA
22206111106	35AWW11_060822	Carbon Dioxide	ug/L	622000	50	NA

EPA RSK-175

Form 1D

Results

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	222061111	Client Sample ID:	35AWW19_060822
Collect Date:	06/08/22 Time: 0715	GCAL Sample ID:	22206111101
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2220614/v8034
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID: .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	50 Analyst: BDP
Prep Date:	NA	Analysis Date:	06/14/22 Time: 1510
Prep Batch:	NA	Analytical Batch:	743215
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	520000		6350	19300	45000

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2220614.b/v8034.d Page 1
Report Date: 14-Jun-2022 16:32

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2220614.b/v8034.d
Lab Smp Id: 22206111101
Inj Date : 14-JUN-2022 15:10
Operator : BDP Inst ID: gcv8b.i
Smp Info : 22206111101*50
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2220614.b/CO2h.m
Meth Date : 14-Jun-2022 16:32 awe Quant Type: ESTD
Cal Date : 22-FEB-2022 13:41 Cal File: v8010.d
Als bottle: 1
Dil Factor: 50.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.000	0.996	0.004	44652954	10407.0	520000

Data File: /var/chem/gcv8b.i/2220614.b/v8034.d

Date : 14-JUN-2022 15:10

Client ID:

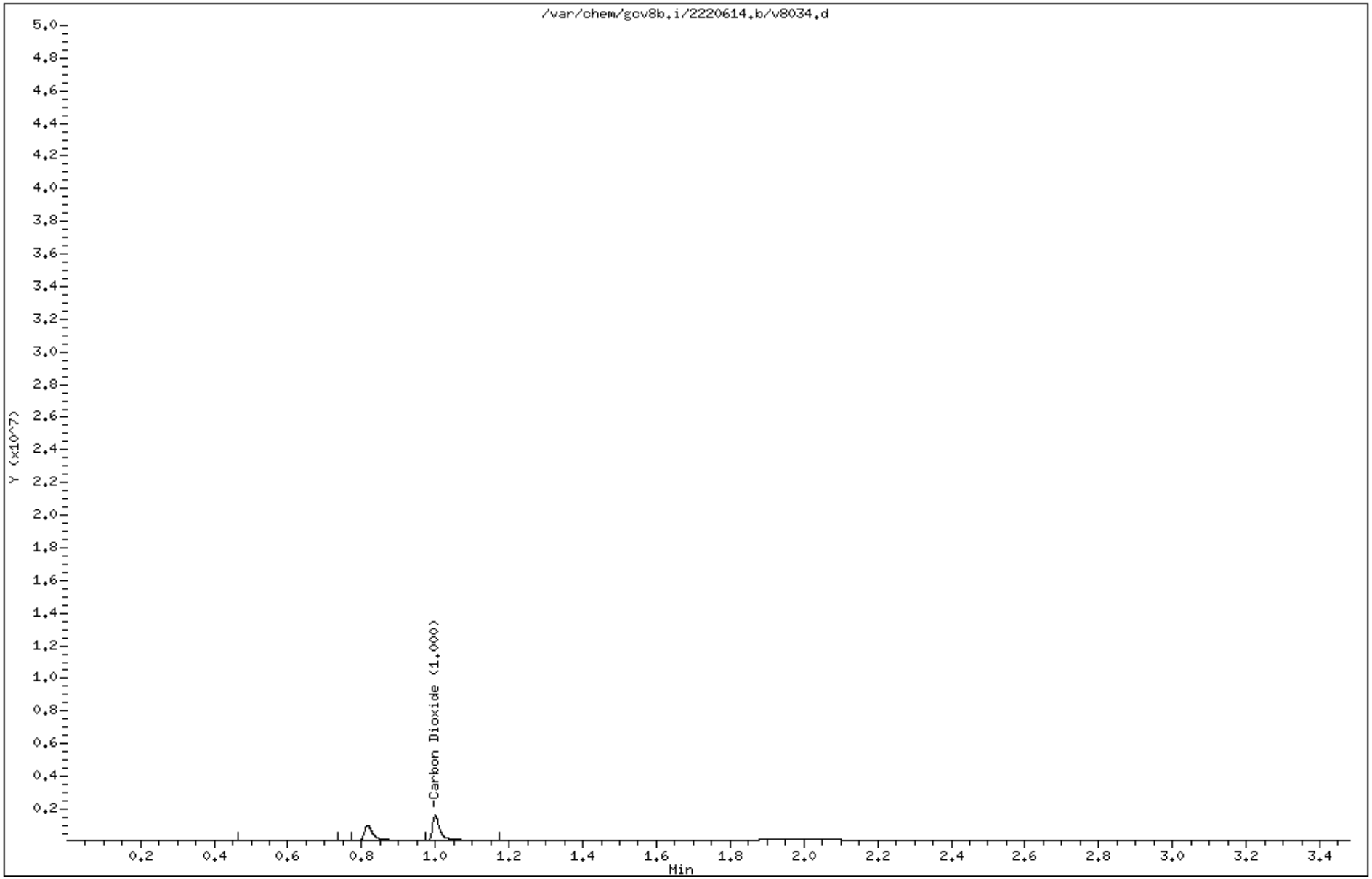
Instrument: gcv8b.i

Sample Info: 22206111101*50

Operator: BDP

Column phase: GS-Q-30

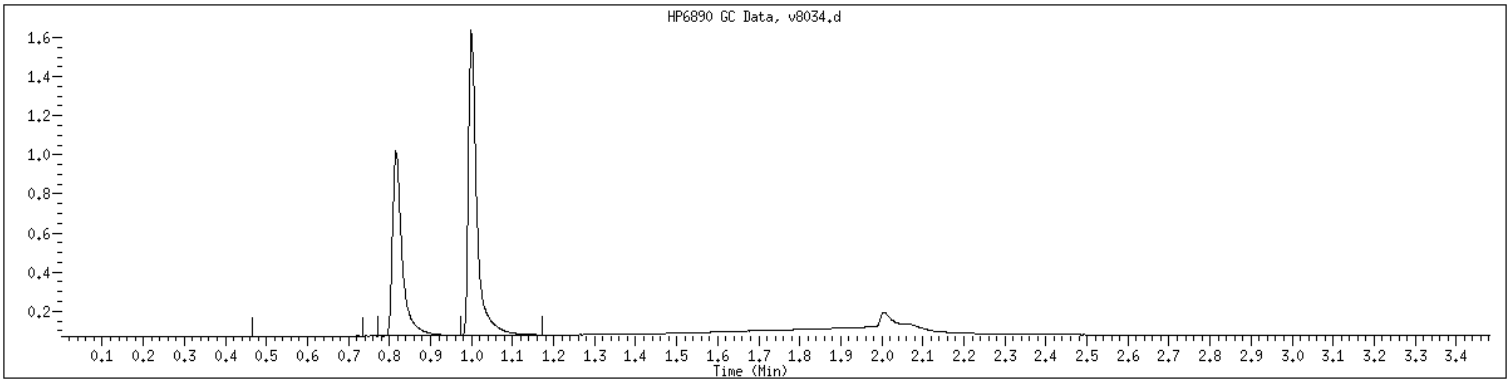
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2220614.b/v8034.d Page: 1
Report Date: 06/14/2022 16:32

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 22206111101	SampleType	: SAMPLE
Injection Date	: 06/14/2022 15:10	Instrument	: gcv8b.i
Operator	: BDP		
Sample Info	: 22206111101*50		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2220614.b/CO2h.m		
Dilution	: 50.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

1D
ORGANICS ANALYSIS DATA SHEET

Report No:	222061111	Client Sample ID:	35AWW23_060822
Collect Date:	06/08/22 Time: 0805	GCAL Sample ID:	22206111102
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2220614/v8035
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID: .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	50 Analyst: BDP
Prep Date:	NA	Analysis Date:	06/14/22 Time: 1524
Prep Batch:	NA	Analytical Batch:	743215
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	520000		6350	19300	45000

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2220614.b/v8035.d Page 1
Report Date: 14-Jun-2022 16:32

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2220614.b/v8035.d
Lab Smp Id: 22206111102
Inj Date : 14-JUN-2022 15:24
Operator : BDP Inst ID: gcv8b.i
Smp Info : 22206111102*50
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2220614.b/CO2h.m
Meth Date : 14-Jun-2022 16:32 awe Quant Type: ESTD
Cal Date : 22-FEB-2022 13:41 Cal File: v8010.d
Als bottle: 1
Dil Factor: 50.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	0.996	0.996	0.000	44621436	10399.6	520000

Data File: /var/chem/gcv8b.i/2220614.b/v8035.d

Date : 14-JUN-2022 15:24

Client ID:

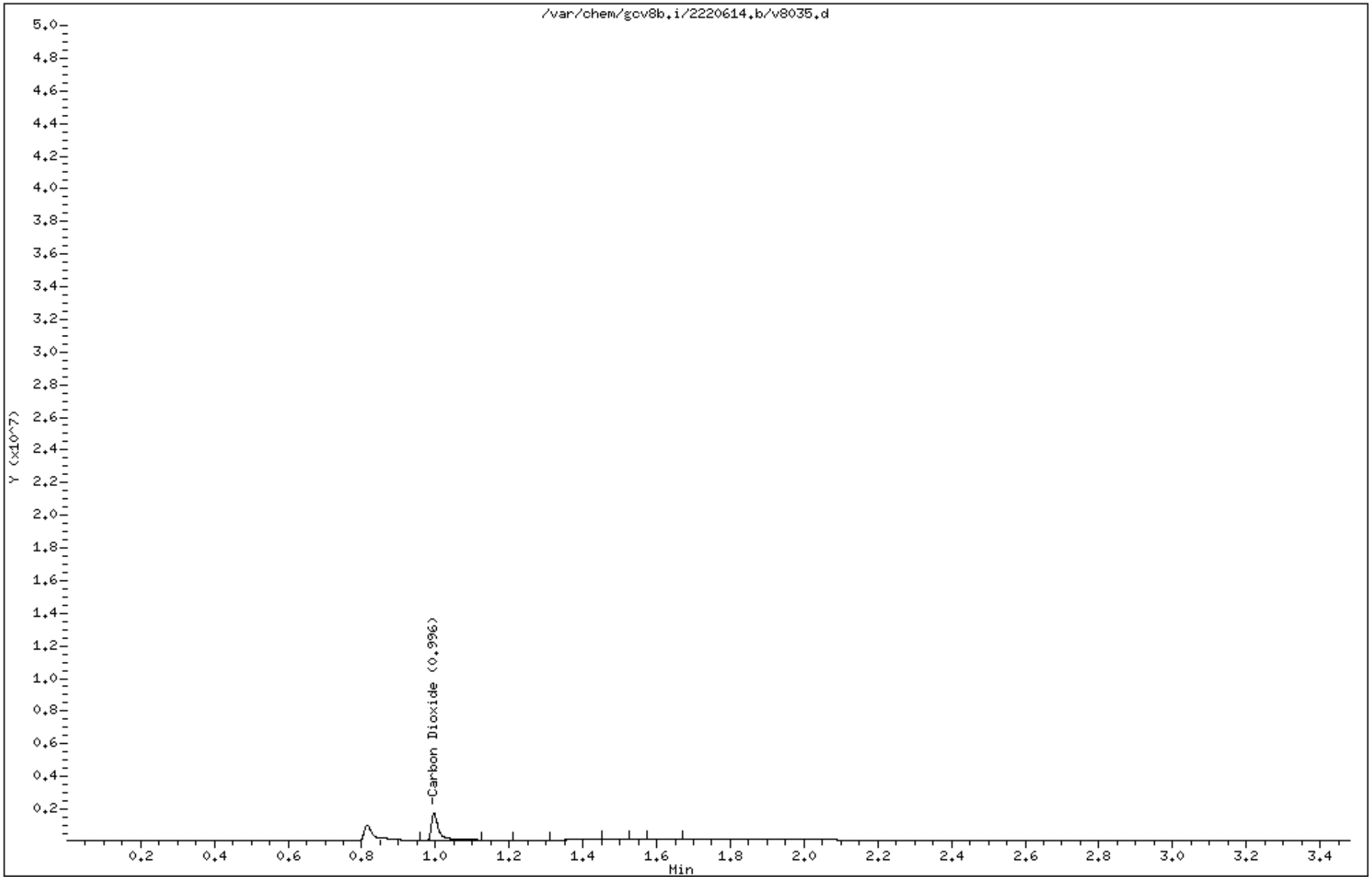
Instrument: gcv8b.i

Sample Info: 22206111102*50

Operator: BDP

Column phase: GS-Q-30

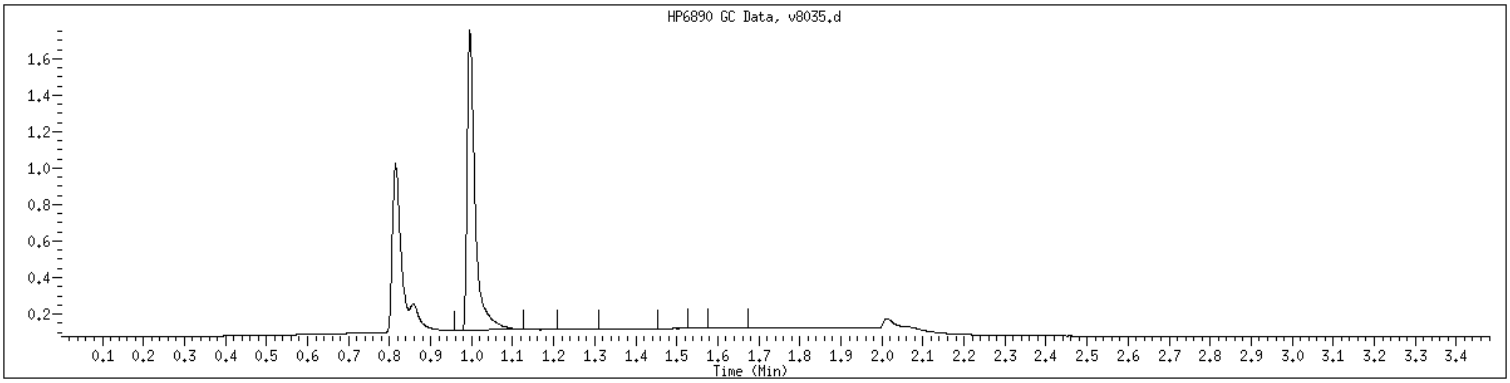
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2220614.b/v8035.d Page: 1
Report Date: 06/14/2022 16:32

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 22206111102	SampleType	: SAMPLE
Injection Date	: 06/14/2022 15:24	Instrument	: gcv8b.i
Operator	: BDP		
Sample Info	: 22206111102*50		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2220614.b/CO2h.m		
Dilution	: 50.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	222061111	Client Sample ID:	35AWW06_060822
Collect Date:	06/08/22 Time: 0900	GCAL Sample ID:	22206111103
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2220614/v8036
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID: .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	50 Analyst: BDP
Prep Date:	NA	Analysis Date:	06/14/22 Time: 1530
Prep Batch:	NA	Analytical Batch:	743215
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	391000		6350	19300	45000

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2220614.b/v8036.d Page 1
Report Date: 14-Jun-2022 16:32

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2220614.b/v8036.d
Lab Smp Id: 22206111103
Inj Date : 14-JUN-2022 15:30
Operator : BDP Inst ID: gcv8b.i
Smp Info : 22206111103*50
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2220614.b/CO2h.m
Meth Date : 14-Jun-2022 16:32 awe Quant Type: ESTD
Cal Date : 22-FEB-2022 13:41 Cal File: v8010.d
Als bottle: 1
Dil Factor: 50.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	0.994	0.996	-0.002	33564319	7822.61	391000

Data File: /var/chem/gcv8b.i/2220614.b/v8036.d

Date : 14-JUN-2022 15:30

Client ID:

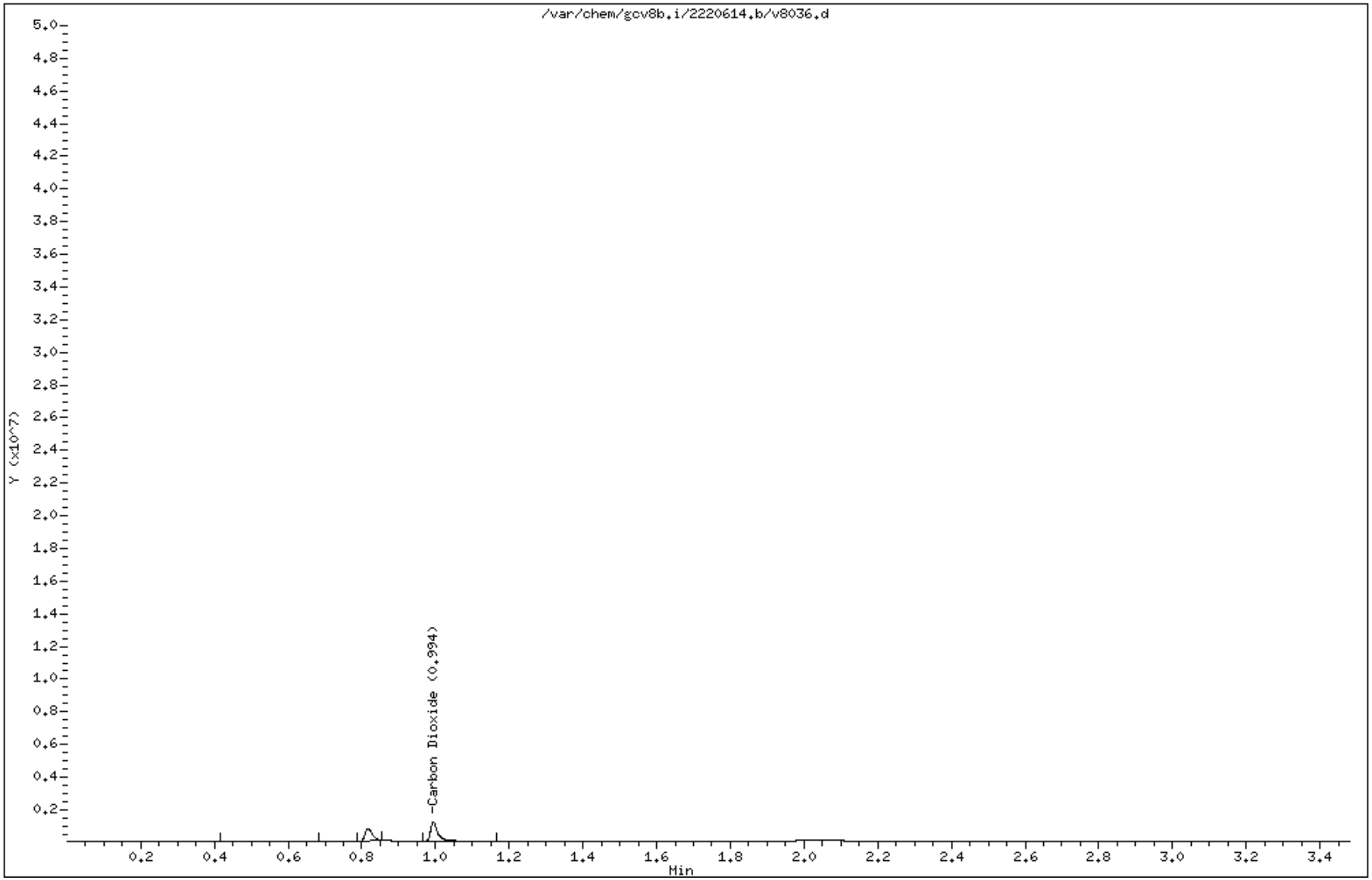
Instrument: gcv8b.i

Sample Info: 22206111103*50

Operator: BDP

Column phase: GS-Q-30

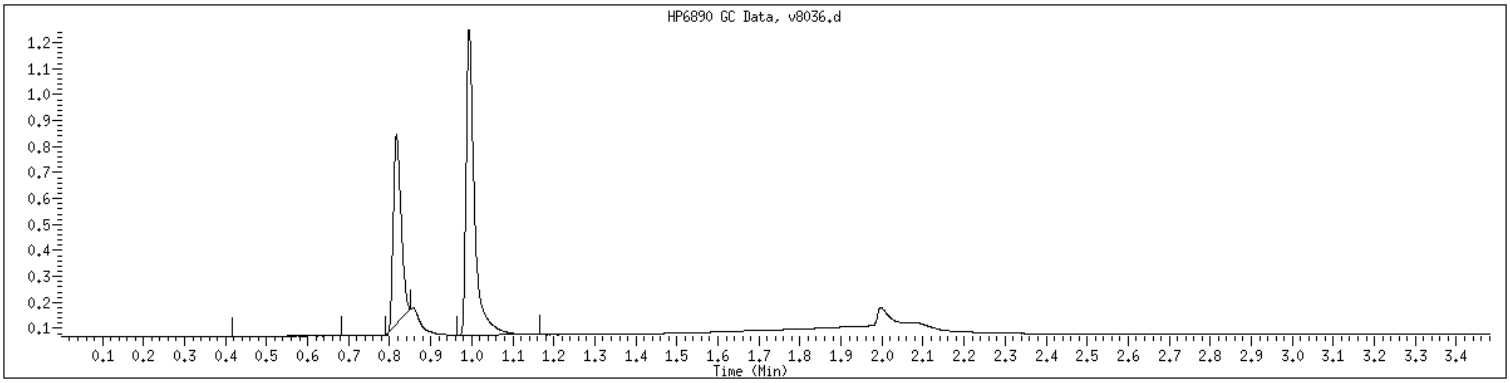
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2220614.b/v8036.d Page: 1
Report Date: 06/14/2022 16:32

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 22206111103	SampleType	: SAMPLE
Injection Date	: 06/14/2022 15:30	Instrument	: gcv8b.i
Operator	: BDP		
Sample Info	: 22206111103*50		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2220614.b/CO2h.m		
Dilution	: 50.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

1D
ORGANICS ANALYSIS DATA SHEET

Report No:	222061111	Client Sample ID:	LHSMW07_060822
Collect Date:	06/08/22 Time: 0950	GCAL Sample ID:	22206111104
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2220614/v8037
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID: .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	50 Analyst: BDP
Prep Date:	NA	Analysis Date:	06/14/22 Time: 1535
Prep Batch:	NA	Analytical Batch:	743215
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	173000		6350	19300	45000

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2220614.b/v8037.d Page 1
Report Date: 14-Jun-2022 16:32

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2220614.b/v8037.d
Lab Smp Id: 22206111104
Inj Date : 14-JUN-2022 15:35
Operator : BDP Inst ID: gcv8b.i
Smp Info : 22206111104*50
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2220614.b/CO2h.m
Meth Date : 14-Jun-2022 16:32 awe Quant Type: ESTD
Cal Date : 22-FEB-2022 13:41 Cal File: v8010.d
Als bottle: 1
Dil Factor: 50.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	0.975	0.996	-0.021	14876170	3467.09	173000

Data File: /var/chem/gcv8b.i/2220614.b/v8037.d

Date : 14-JUN-2022 15:35

Client ID:

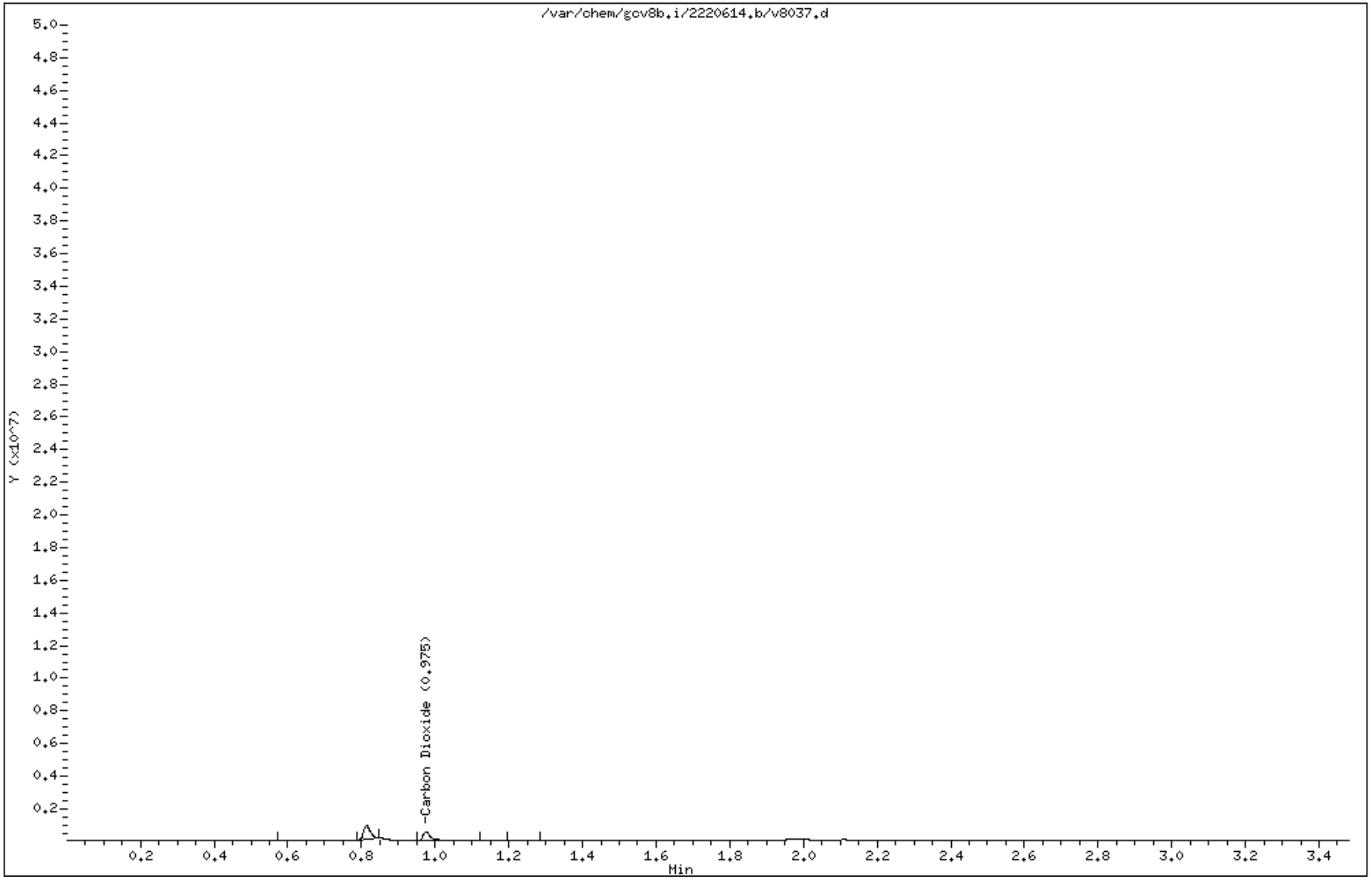
Instrument: gcv8b.i

Sample Info: 22206111104*50

Operator: BDP

Column phase: GS-Q-30

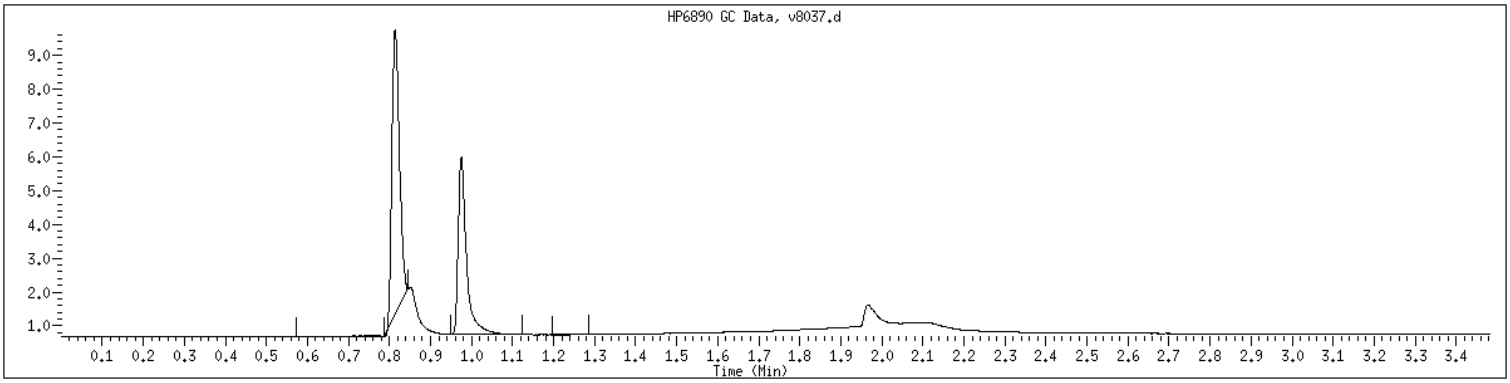
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2220614.b/v8037.d Page: 1
Report Date: 06/14/2022 16:32

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 22206111104	SampleType	: SAMPLE
Injection Date	: 06/14/2022 15:35	Instrument	: gcv8b.i
Operator	: BDP		
Sample Info	: 22206111104*50		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2220614.b/CO2h.m		
Dilution	: 50.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	222061111	Client Sample ID:	35AWW20_060822
Collect Date:	06/08/22 Time: 1045	GCAL Sample ID:	22206111105
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2220614/v8038
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID: .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	50 Analyst: BDP
Prep Date:	NA	Analysis Date:	06/14/22 Time: 1541
Prep Batch:	NA	Analytical Batch:	743215
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	458000		6350	19300	45000

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2220614.b/v8038.d Page 1
Report Date: 14-Jun-2022 16:32

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2220614.b/v8038.d
Lab Smp Id: 22206111105
Inj Date : 14-JUN-2022 15:41
Operator : BDP Inst ID: gcv8b.i
Smp Info : 22206111105*50
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2220614.b/CO2h.m
Meth Date : 14-Jun-2022 16:32 awe Quant Type: ESTD
Cal Date : 22-FEB-2022 13:41 Cal File: v8010.d
Als bottle: 1
Dil Factor: 50.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.000	0.996	0.004	39317936	9163.57	458000

Data File: /var/chem/gcv8b.i/2220614.b/v8038.d

Date : 14-JUN-2022 15:41

Client ID:

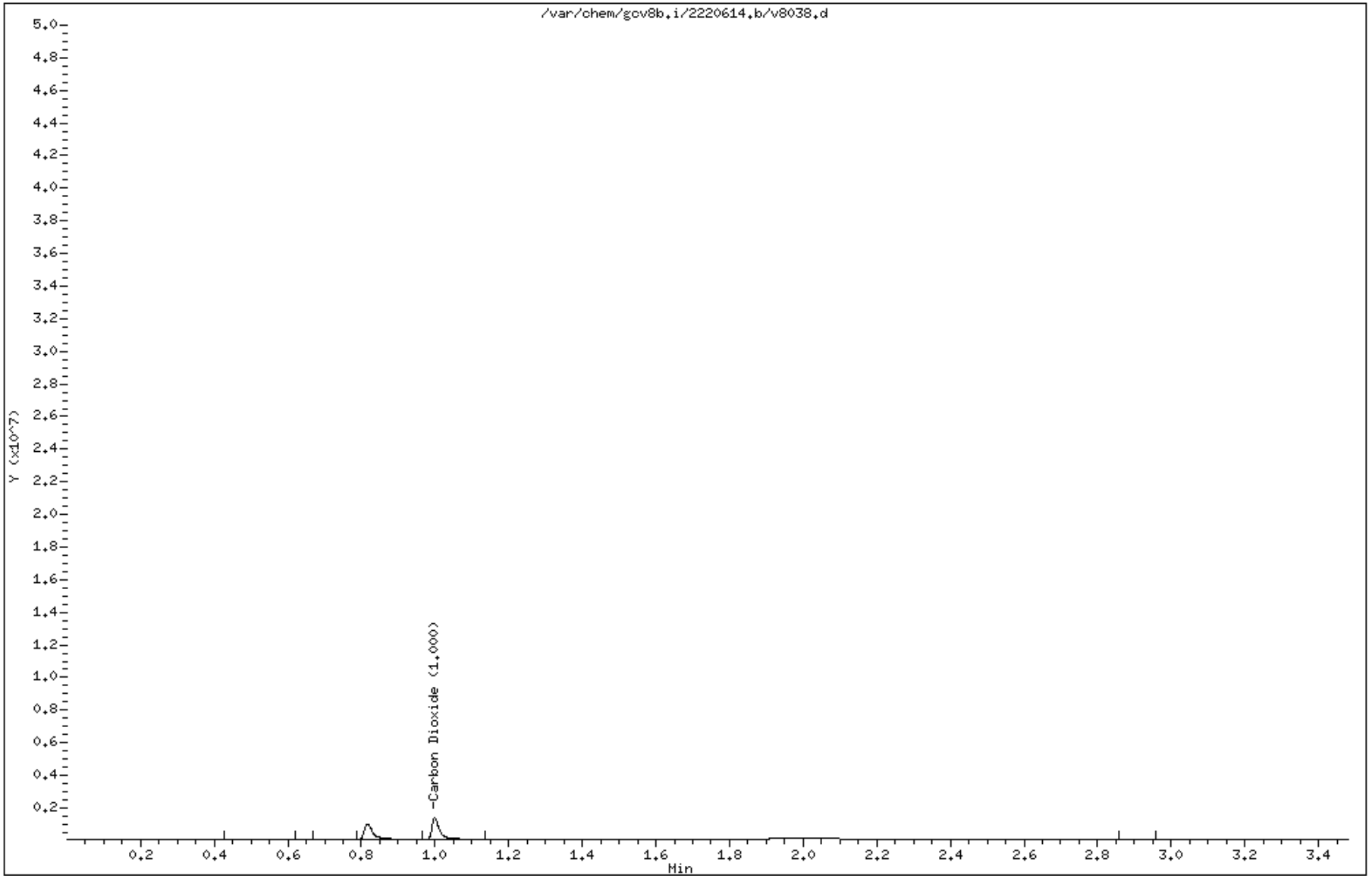
Instrument: gcv8b.i

Sample Info: 22206111105*50

Operator: BDP

Column phase: GS-Q-30

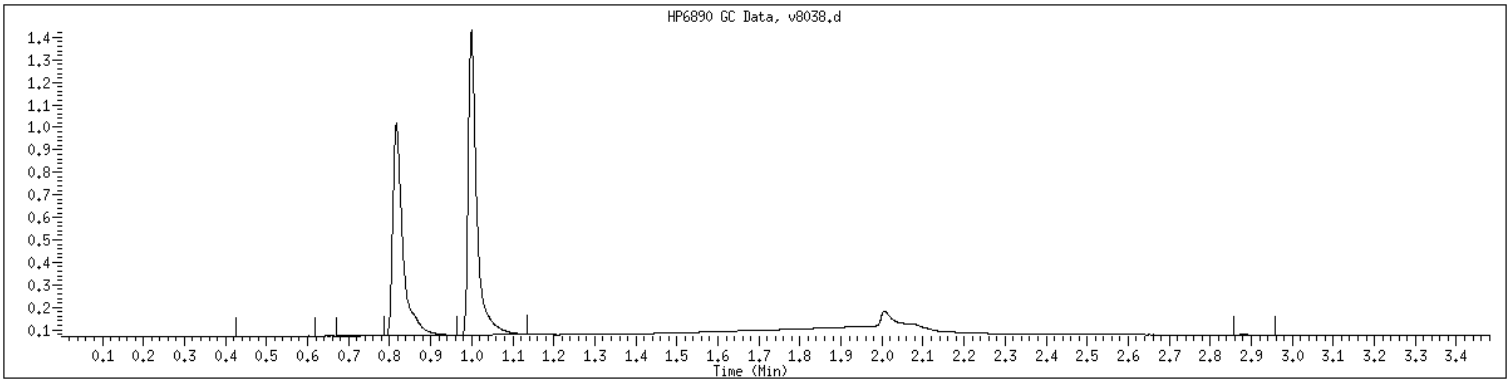
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2220614.b/v8038.d Page: 1
Report Date: 06/14/2022 16:32

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 22206111105	SampleType	: SAMPLE
Injection Date	: 06/14/2022 15:41	Instrument	: gcv8b.i
Operator	: BDP		
Sample Info	: 22206111105*50		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2220614.b/CO2h.m		
Dilution	: 50.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	222061111	Client Sample ID:	35AWW11_060822
Collect Date:	06/08/22 Time: 1140	GCAL Sample ID:	22206111106
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2220614/v8039
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID: .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	50 Analyst: BDP
Prep Date:	NA	Analysis Date:	06/14/22 Time: 1552
Prep Batch:	NA	Analytical Batch:	743215
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	622000		6350	19300	45000

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2220614.b/v8039.d Page 1
Report Date: 14-Jun-2022 16:32

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2220614.b/v8039.d
Lab Smp Id: 22206111106
Inj Date : 14-JUN-2022 15:52
Operator : BDP Inst ID: gcv8b.i
Smp Info : 22206111106*50
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2220614.b/CO2h.m
Meth Date : 14-Jun-2022 16:32 awe Quant Type: ESTD
Cal Date : 22-FEB-2022 13:41 Cal File: v8010.d
Als bottle: 1
Dil Factor: 50.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.001	0.996	0.005	53368609	12438.3	622000

Data File: /var/chem/gcv8b.i/2220614.b/v8039.d

Date : 14-JUN-2022 15:52

Client ID:

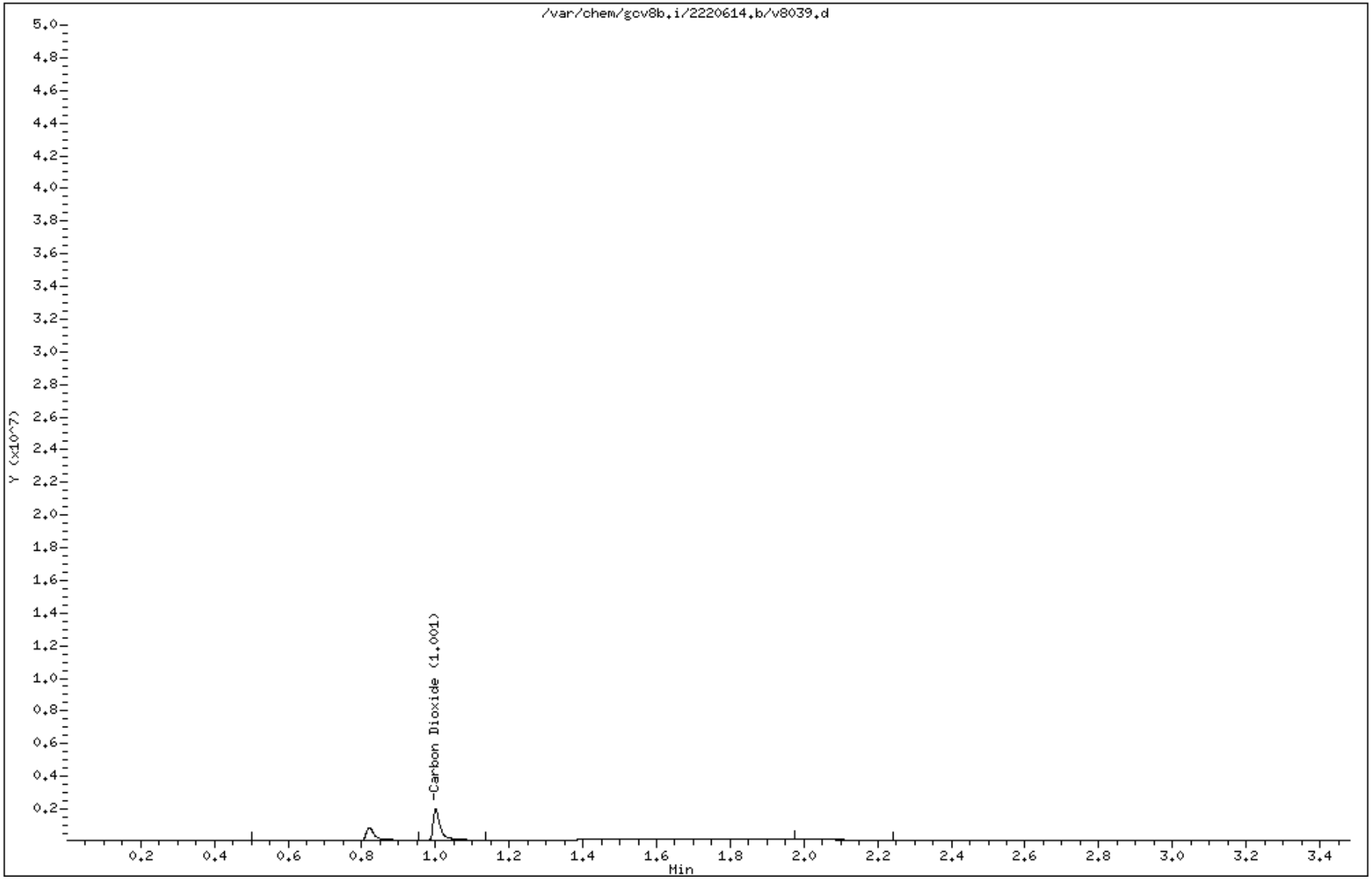
Instrument: gcv8b.i

Sample Info: 22206111106*50

Operator: BDP

Column phase: GS-Q-30

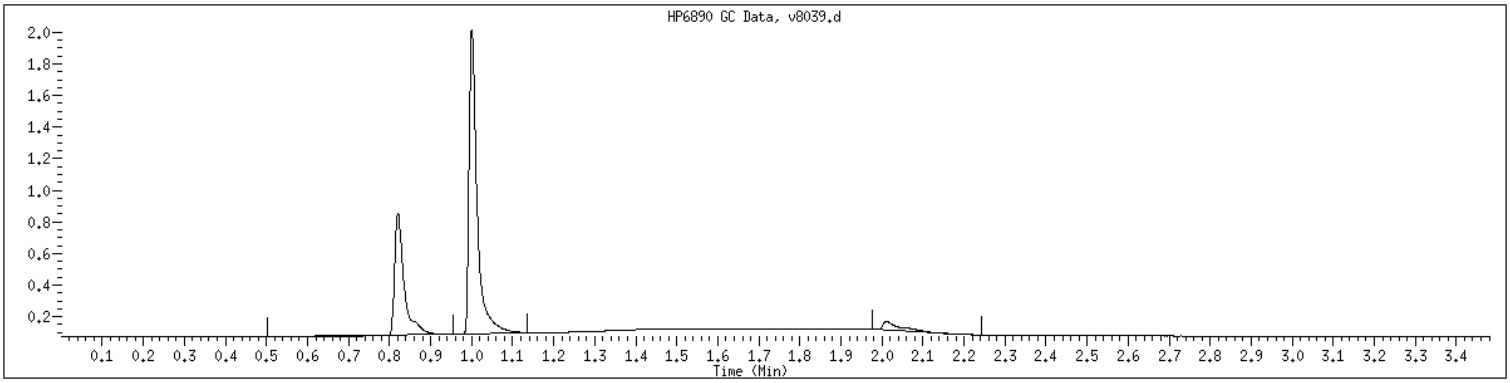
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2220614.b/v8039.d Page: 1
Report Date: 06/14/2022 16:32

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 22206111106	SampleType	: SAMPLE
Injection Date	: 06/14/2022 15:52	Instrument	: gcv8b.i
Operator	: BDP		
Sample Info	: 22206111106*50		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2220614.b/CO2h.m		
Dilution	: 50.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

1D
ORGANICS ANALYSIS DATA SHEET

Report No:	222061111	Client Sample ID:	MB2358565
Collect Date:	NA Time: NA	GCAL Sample ID:	2358565
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2220614/v8008
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID: .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	1 Analyst: BDP
Prep Date:	NA	Analysis Date:	06/14/22 Time: 1024
Prep Batch:	NA	Analytical Batch:	743215
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	250	J	127	386	900

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2220614.b/v8008.d Page 1
Report Date: 14-Jun-2022 16:32

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2220614.b/v8008.d
Lab Smp Id: 2358565
Inj Date : 14-JUN-2022 10:24
Operator : BDP Inst ID: gcv8b.i
Smp Info : BLANK
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2220614.b/CO2h.m
Meth Date : 14-Jun-2022 16:32 awe Quant Type: ESTD
Cal Date : 22-FEB-2022 13:41 Cal File: v8010.d
Als bottle: 1 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	0.986	0.999	-0.013	1073665	250.232	250(M1)

QC Flag Legend

M1- Compound response manually integrated because
Target system did not integrate.

Data File: /var/chem/gcv8b.i/2220614.b/v8008.d

Page 1

Date : 14-JUN-2022 10:24

Client ID:

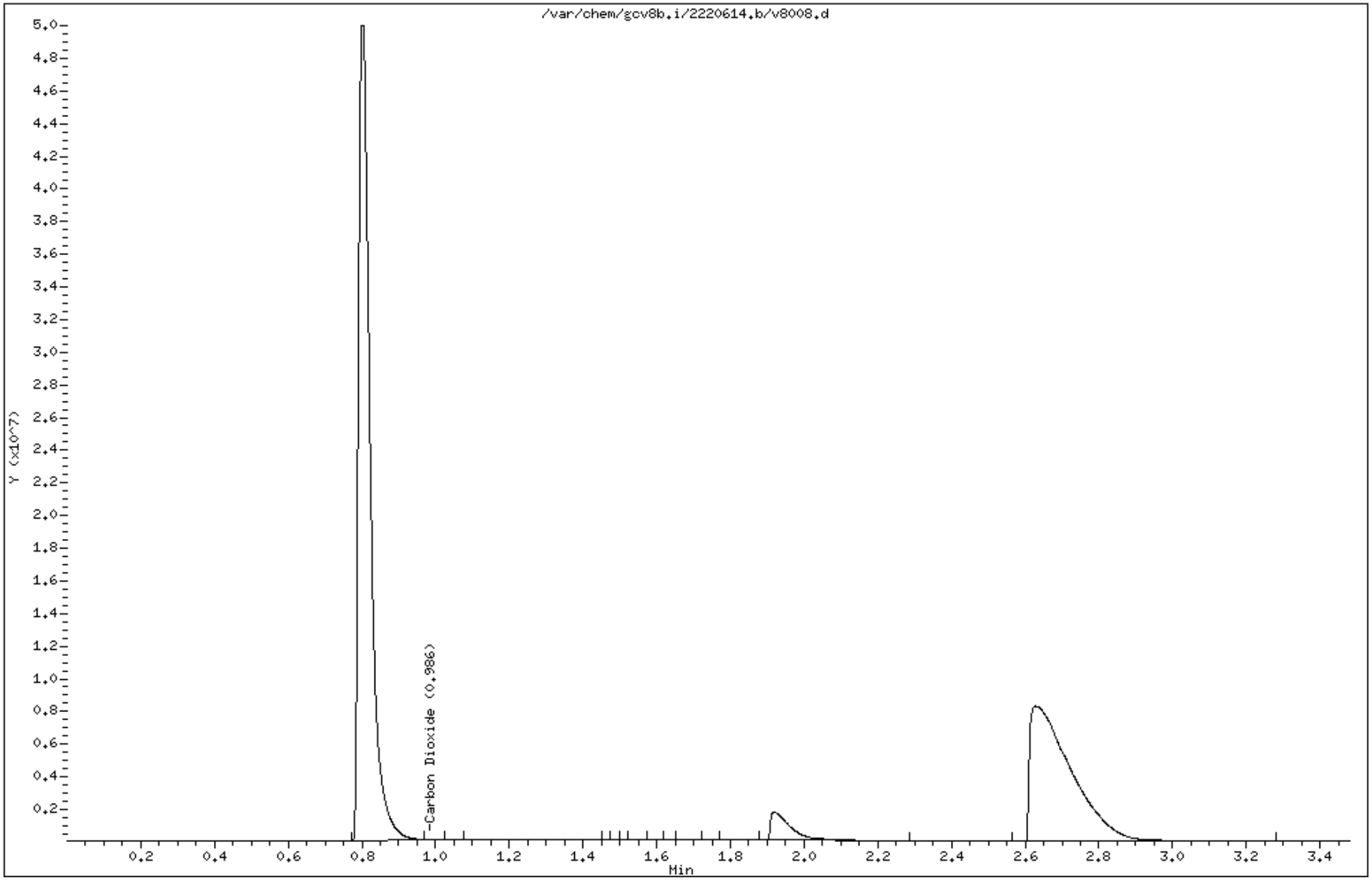
Instrument: gcv8b.i

Sample Info: BLANK

Operator: BDP

Column phase: GS-Q-30

Column diameter: 0.53

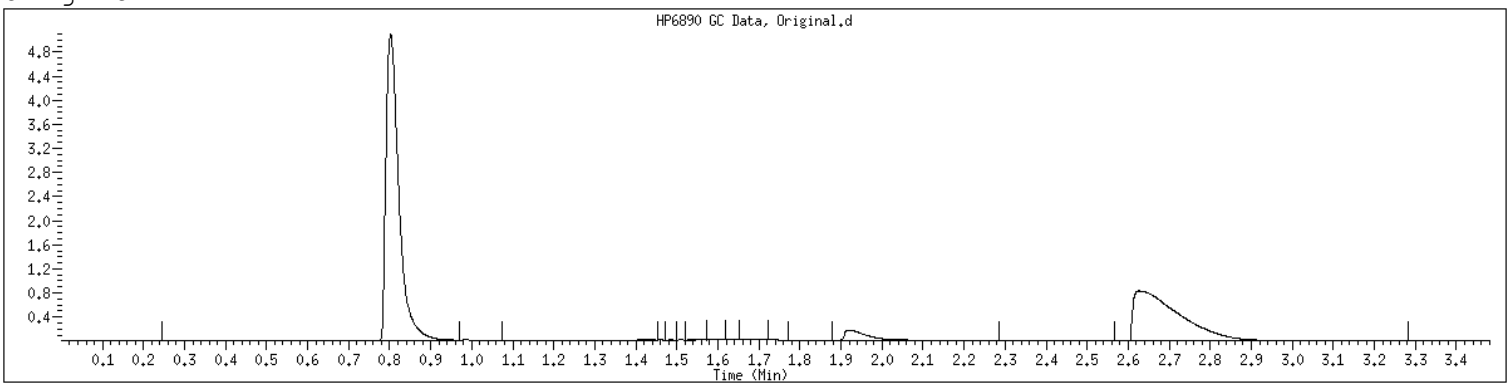


Data file : /var/chem/gcv8b.i/2220614.b/v8008.d Page: 1
Report Date: 06/14/2022 16:32

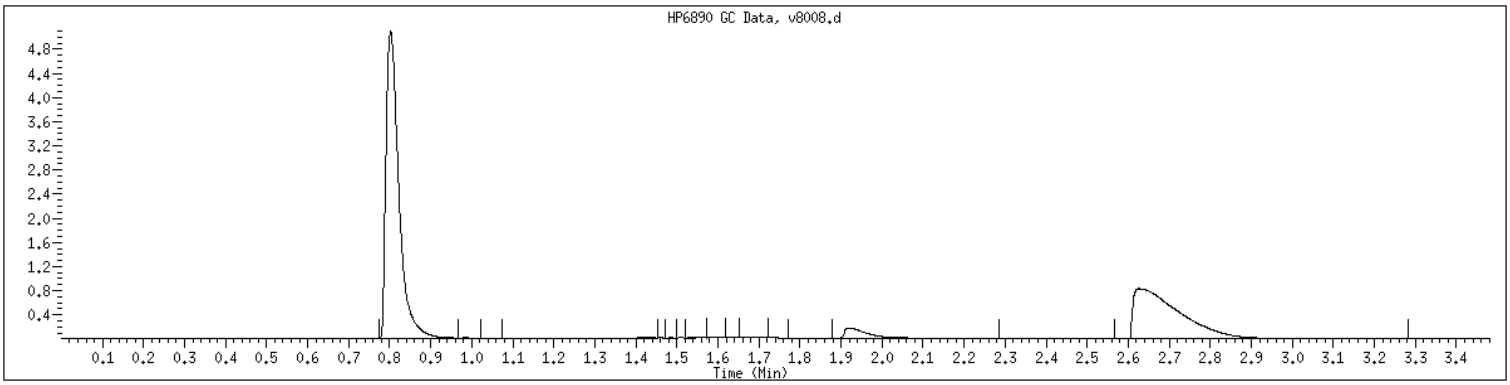
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 2358565	SampleType	: BLANK
Injection Date	: 06/14/2022 10:24	Instrument	: gcv8b.i
Operator	: BDP		
Sample Info	: BLANK		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2220614.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2

Original



Final



1D
ORGANICS ANALYSIS DATA SHEET

Report No:	222061111	Client Sample ID:	LCS2358566
Collect Date:	NA Time: NA	GCAL Sample ID:	2358566
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2220614/v8005
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID: .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	1 Analyst: BDP
Prep Date:	NA	Analysis Date:	06/14/22 Time: 0945
Prep Batch:	NA	Analytical Batch:	743215
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	3980		127	386	900

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2220614.b/v8005.d Page 1
Report Date: 14-Jun-2022 16:32

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2220614.b/v8005.d
Lab Smp Id: 2358566
Inj Date : 14-JUN-2022 09:45
Operator : BDP Inst ID: gcv8b.i
Smp Info : LCS
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2220614.b/CO2h.m
Meth Date : 14-Jun-2022 16:32 awe Quant Type: ESTD
Cal Date : 22-FEB-2022 13:41 Cal File: v8010.d
Als bottle: 1 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	0.983	0.999	-0.016	17078399	3980.35	3980

Data File: /var/chem/gcv8b.i/2220614.b/v8005.d

Date : 14-JUN-2022 09:45

Client ID:

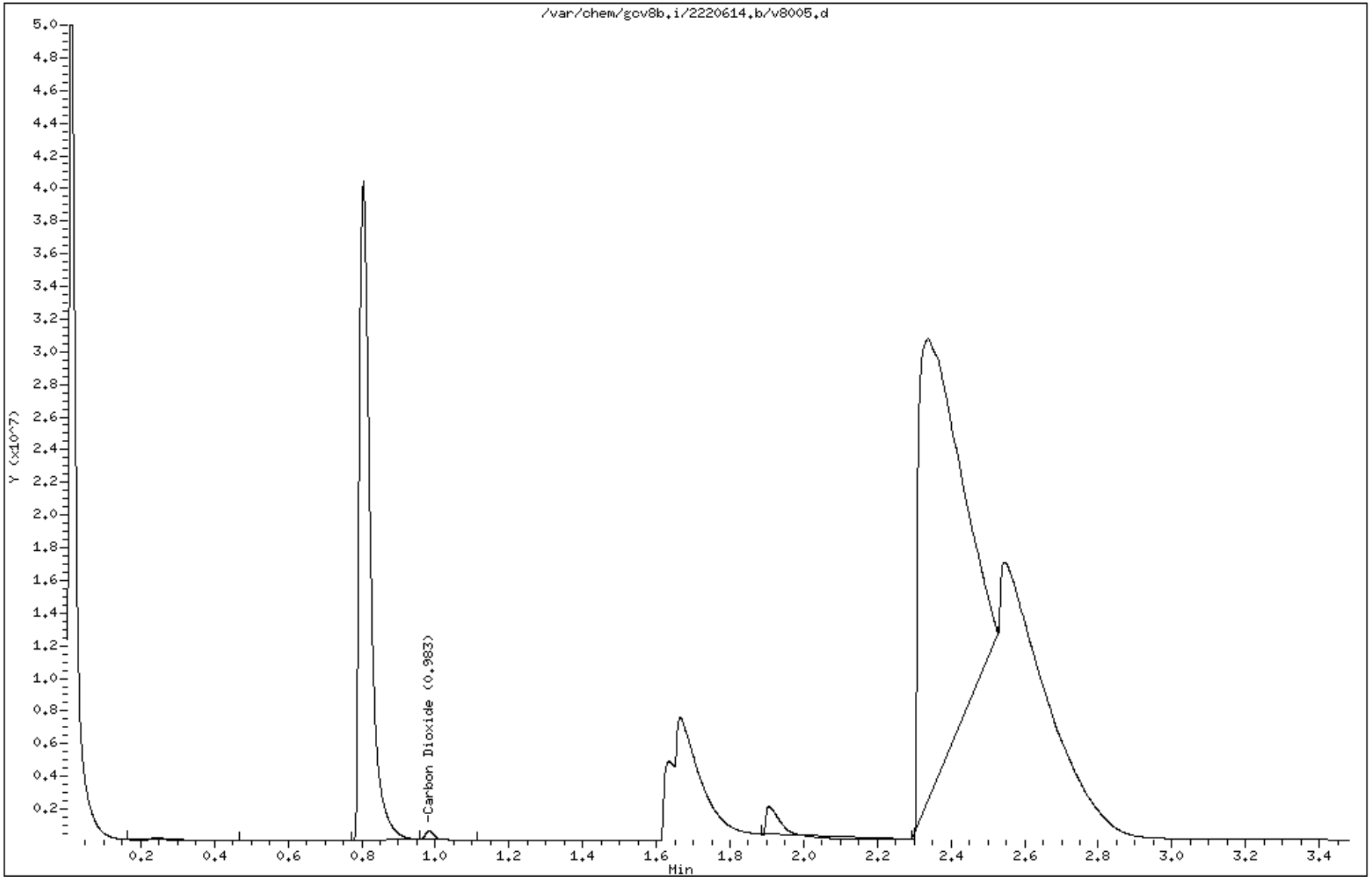
Instrument: gcv8b.i

Sample Info: LCS

Operator: BDP

Column phase: GS-Q-30

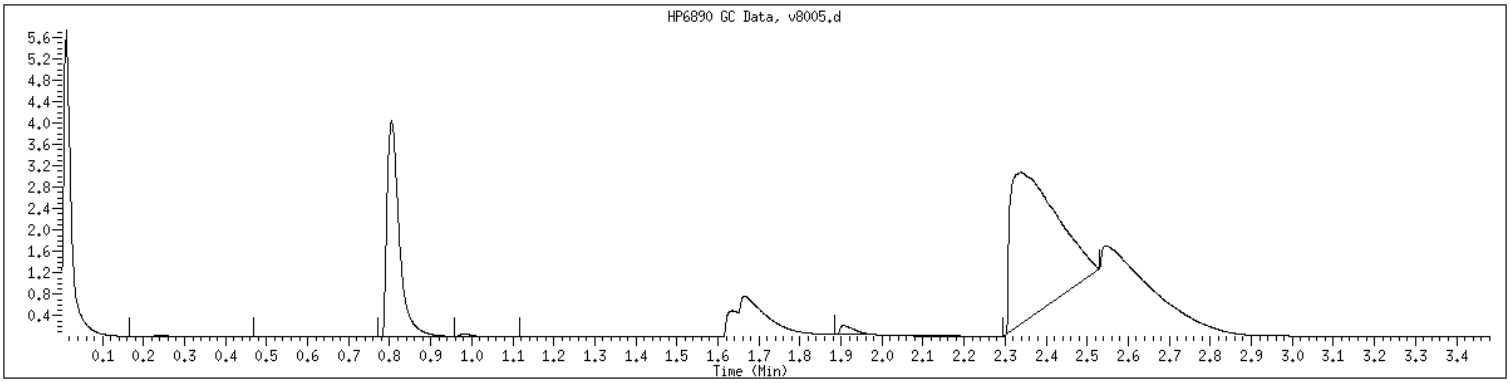
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2220614.b/v8005.d Page: 1
Report Date: 06/14/2022 16:32

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 2358566	SampleType	: LCS
Injection Date	: 06/14/2022 09:45	Instrument	: gcv8b.i
Operator	: BDP		
Sample Info	: LCS		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2220614.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

1D
ORGANICS ANALYSIS DATA SHEET

Report No:	222061111	Client Sample ID:	LCSD2358567
Collect Date:	NA Time: NA	GCAL Sample ID:	2358567
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2220614/v8006
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID: .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	1 Analyst: BDP
Prep Date:	NA	Analysis Date:	06/14/22 Time: 0952
Prep Batch:	NA	Analytical Batch:	743215
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	5210		127	386	900

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2220614.b/v8006.d Page 1
Report Date: 14-Jun-2022 16:32

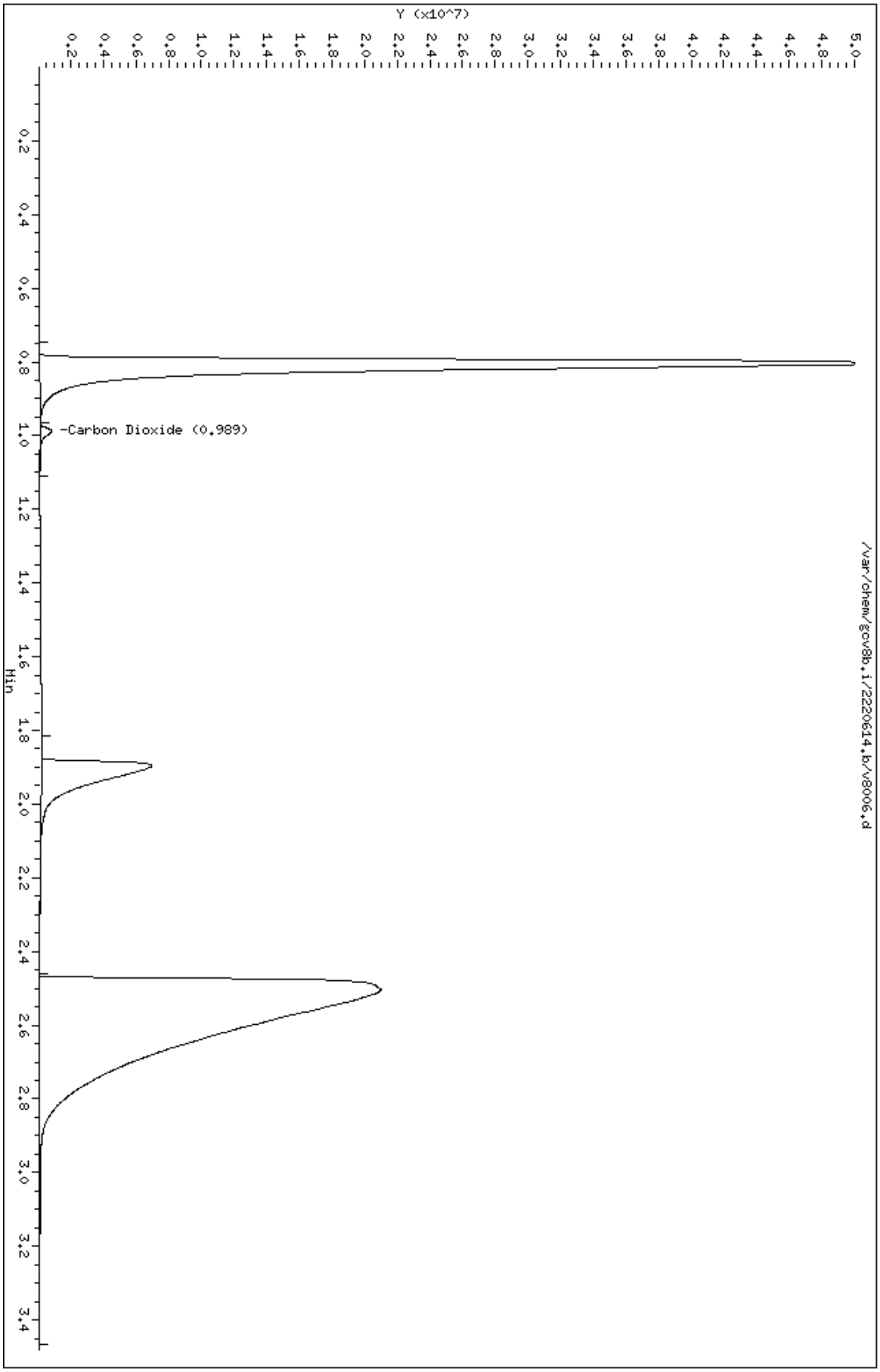
GCAL, Inc.

Data file : /var/chem/gcv8b.i/2220614.b/v8006.d
Lab Smp Id: 2358567
Inj Date : 14-JUN-2022 09:52
Operator : BDP Inst ID: gcv8b.i
Smp Info : LCSD
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2220614.b/CO2h.m
Meth Date : 14-Jun-2022 16:32 awe Quant Type: ESTD
Cal Date : 22-FEB-2022 13:41 Cal File: v8010.d
Als bottle: 1 QC Sample: LCSD
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

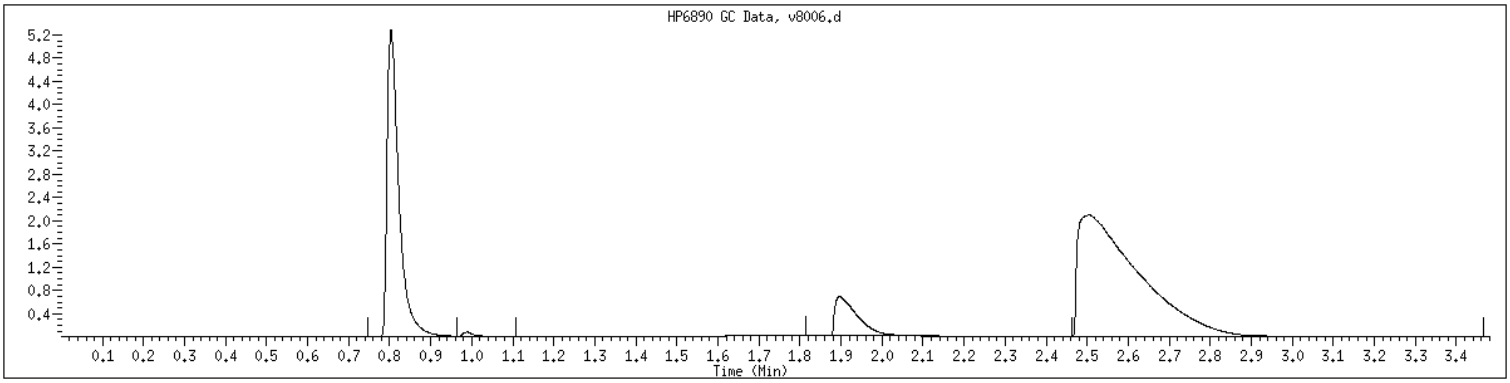
					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	0.989	0.999	-0.010	22345207	5207.85	5210


Data File: /var/chem/gcv8b.i/220614.b/v8006.d
Date : 14-JUN-2022 09:52
Client ID:
Sample Info: LCSD
Column phase: GS-Q-30
Instrument: gcv8b.i
Operator: BDP
Column diameter: 0.53
Page 1
Y (x10^7)
-Carbon Dioxide (0.989)
/var/chem/gcv8b.i/220614.b/v8006.d
Min

Data file : /var/chem/gcv8b.i/2220614.b/v8006.d Page: 1
Report Date: 06/14/2022 16:32

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 2358567	SampleType	: LCSD
Injection Date	: 06/14/2022 09:52	Instrument	: gcv8b.i
Operator	: BDP		
Sample Info	: LCSD		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2220614.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

EPA RSK-175

Form 3E

Spikes

3E

WATER ORGANICS LCS/LCSD RECOVERY

Report No:	222061111		
Prep Method:	NA	Prep Batch:	NA
Analytical Method:	RSK-175	Analytical Batch:	743215

GCAL QC ID: 2358566

ANALYTE	*UNITS*	*SPIKE ADDED*	*SAMPLE RESULT*	*LCS RESULT*	*LCS % REC*	#	*QC LIMITS*
Carbon Dioxide	ug/L	8700	0	3980	46		38 - 147

GCAL QC ID: 2358567

ANALYTE	*UNITS*	*SPIKE ADDED*	*LCSD RESULT*	*LCSD % REC*	#	*% RPD*	#	*QC LIMITS REC*	*RPD*
Carbon Dioxide	ug/L	8700	5210	60		27		38 - 147	0 - 40

RPD : 0 out of 1 outside limits

Spike Recovery: 0 out of 2 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III ORG-1

EPA RSK-175

Form 4C

Method Blanks

4C
ORGANIC METHOD BLANK SUMMARY

Report No:	222061111	Method Blank ID:	2358565
Matrix:	Water	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2220614/v8008
Injection Vol.:	(µL)	GC Column:	GS-Q-30 ID: .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	1 Analyst: BDP
Prep Date:	NA	Analysis Date:	06/14/22 Time: 1024
Prep Batch:	NA	Analytical Batch:	743215
Prep Method:	NA	Analytical Method:	RSK-175

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD

	CLIENT SAMPLE ID	GCAL SAMPLE ID	DATE ANALYZED	TIME ANALYZED	INSTRUMENT ID
1.	LCS2358566	2358566	06/14/22	0945	GCV8B
2.	LCSD2358567	2358567	06/14/22	0952	GCV8B
3.	35AWW19_060822	22206111101	06/14/22	1510	GCV8B
4.	35AWW23_060822	22206111102	06/14/22	1524	GCV8B
5.	35AWW06_060822	22206111103	06/14/22	1530	GCV8B
6.	LHSMW07_060822	22206111104	06/14/22	1535	GCV8B
7.	35AWW20_060822	22206111105	06/14/22	1541	GCV8B
8.	35AWW11_060822	22206111106	06/14/22	1552	GCV8B

FORM IV ORGANIC

EPA RSK-175

Form 6E

Calibrations

6E

ORGANICS INITIAL CALIBRATION DATA

				LabQC ID - FileID - Conc	1201 ~ 2220222p/v8006 ~ mix	
Report No:	222061111	Instrument ID:	GCV8B	1202 ~ 2220222p/v8007 ~ mix	1203 ~ 2220222p/v8008 ~ mix	
GC Column:	GS-Q-30 ID: .53 (mm)	Analyst:	AWE	1204 ~ 2220222p/v8009 ~ mix	1205 ~ 2220222p/v8010 ~ mix	
Calib. Date 1:	02/22/22 Time 1: 1306	Analytical Batch:	734177			
Calib. Date 2:	02/22/22 Time 2: 1341	Analytical Method:	RSK-175			

ANALYTE	*1201*	*1202*	*1203*	*1204*	*1205*	*1206*	*1207*	*1208*	*1209*	*RF / m / A*	*b / B*	*C*	*FIT*	*TYPE*
Carbon Dioxide	4254	3160	4842	4450	4748					4291			15.71	A

FIT = %RSD for Average Curve and the Coefficient of Determination (r2) for Linear and Quadratic

Curve Types: A - Averaged, L - Linear Regression, W - Weighted Linear, Q - Quadratic

For curve types L and Q, the RRF and RSP (Response) are shown on separate lines to allow for evaluation against minimum RRF

$\overline{RF}$ = Mean Response Factor For Average Curve

m,b = Slope and Intercept For Linear Curve

A,B,C = Coefficents For Quadratic Curve

FORM V I SVOA

Data File: /var/chem/gcv8b.i/2220222p.b/v8006.d Page 1
Report Date: 23-Feb-2022 09:58

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2220222p.b/v8006.d
Lab Smp Id: 1201
Inj Date : 22-FEB-2022 13:06
Operator : AWE Inst ID: gcv8b.i
Smp Info : 1201
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2220222p.b/CO2h.m
Meth Date : 23-Feb-2022 09:58 awe Quant Type: ESTD
Cal Date : 22-FEB-2022 13:06 Cal File: v8006.d
Als bottle: 1 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	0.993	0.993	0.000	3675073	864.000	856(M1)

QC Flag Legend

M1- Compound response manually integrated because
Target system did not integrate.

Data File: /var/chem/gcv8b.i/2220222p.b/v8006.d

Date : 22-FEB-2022 13:06

Client ID:

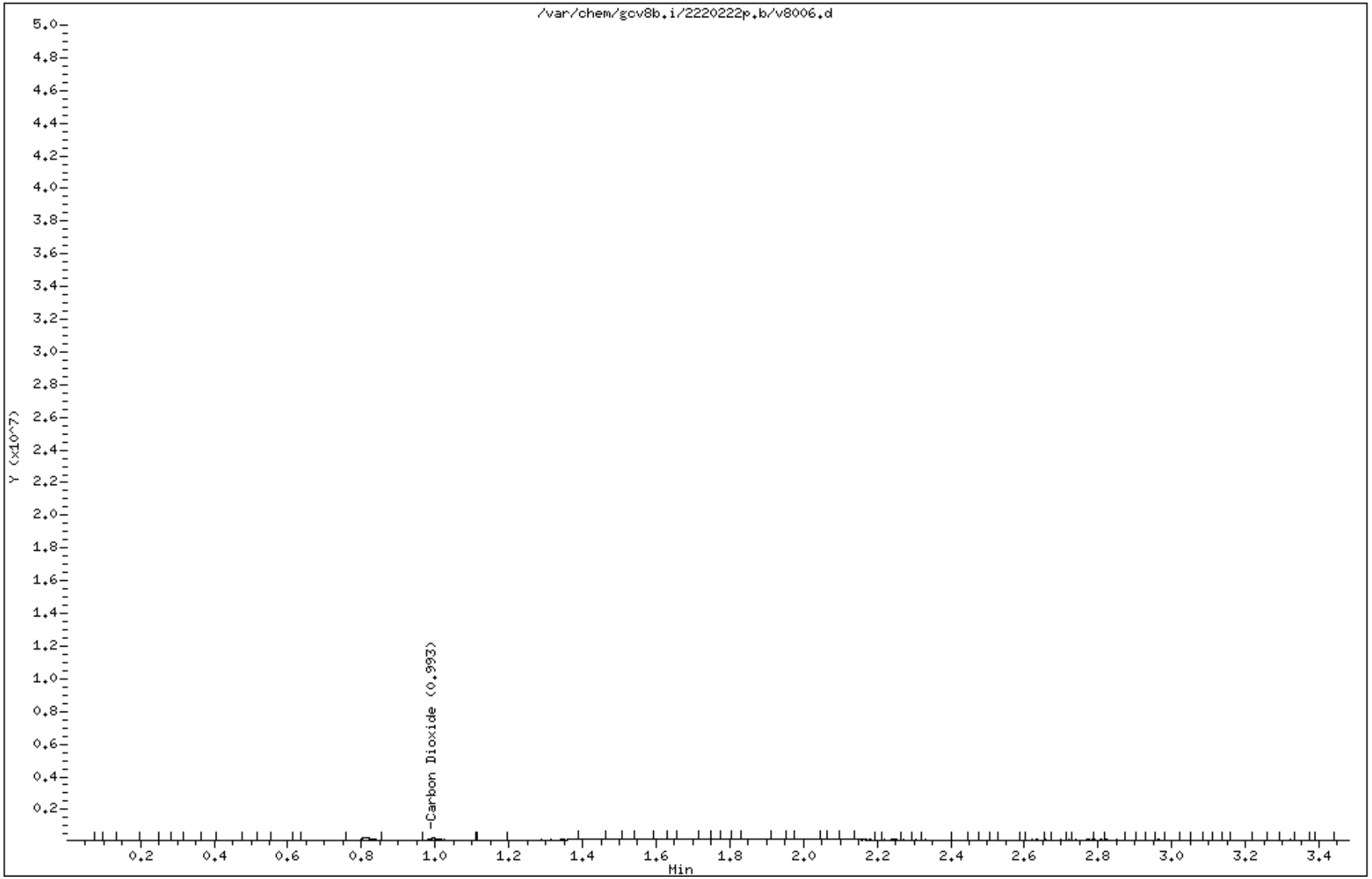
Instrument: gcv8b.i

Sample Info: 1201

Operator: AWE

Column phase: GS-Q-30

Column diameter: 0.53

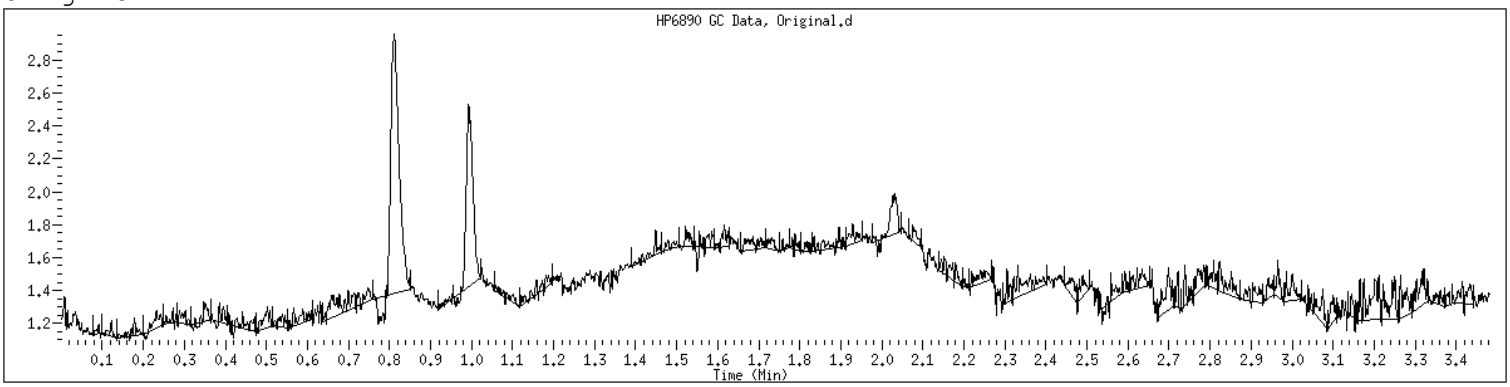


Data file : /var/chem/gcv8b.i/2220222p.b/v8006.d Page: 1
Report Date: 02/23/2022 09:58

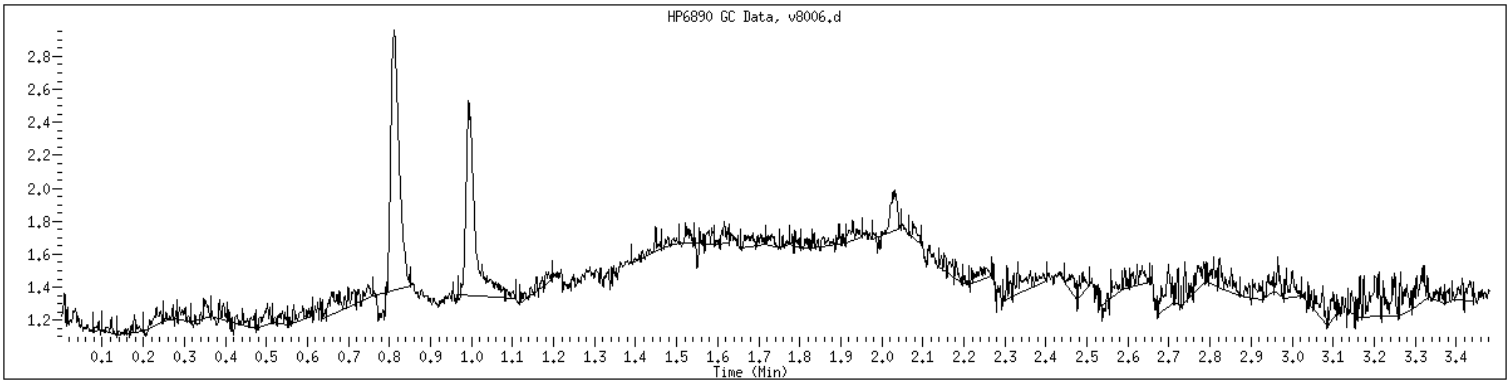
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1201	SampleType	: CALIB_1
Injection Date	: 02/22/2022 13:06	Instrument	: gcv8b.i
Operator	: AWE		
Sample Info	: 1201		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2220222p.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2

Original



Final



Data File: /var/chem/gcv8b.i/2220222p.b/v8007.d Page 1
Report Date: 23-Feb-2022 09:58

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2220222p.b/v8007.d
Lab Smp Id: 1202
Inj Date : 22-FEB-2022 13:13
Operator : AWE Inst ID: gcv8b.i
Smp Info : 1202
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2220222p.b/CO2h.m
Meth Date : 23-Feb-2022 09:58 awe Quant Type: ESTD
Cal Date : 22-FEB-2022 13:13 Cal File: v8007.d
Als bottle: 1 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.000	1.000	0.000	5466982	1730.00	1270

Data File: /var/chem/gcv8b.i/2220222p.b/v8007.d

Date : 22-FEB-2022 13:13

Client ID:

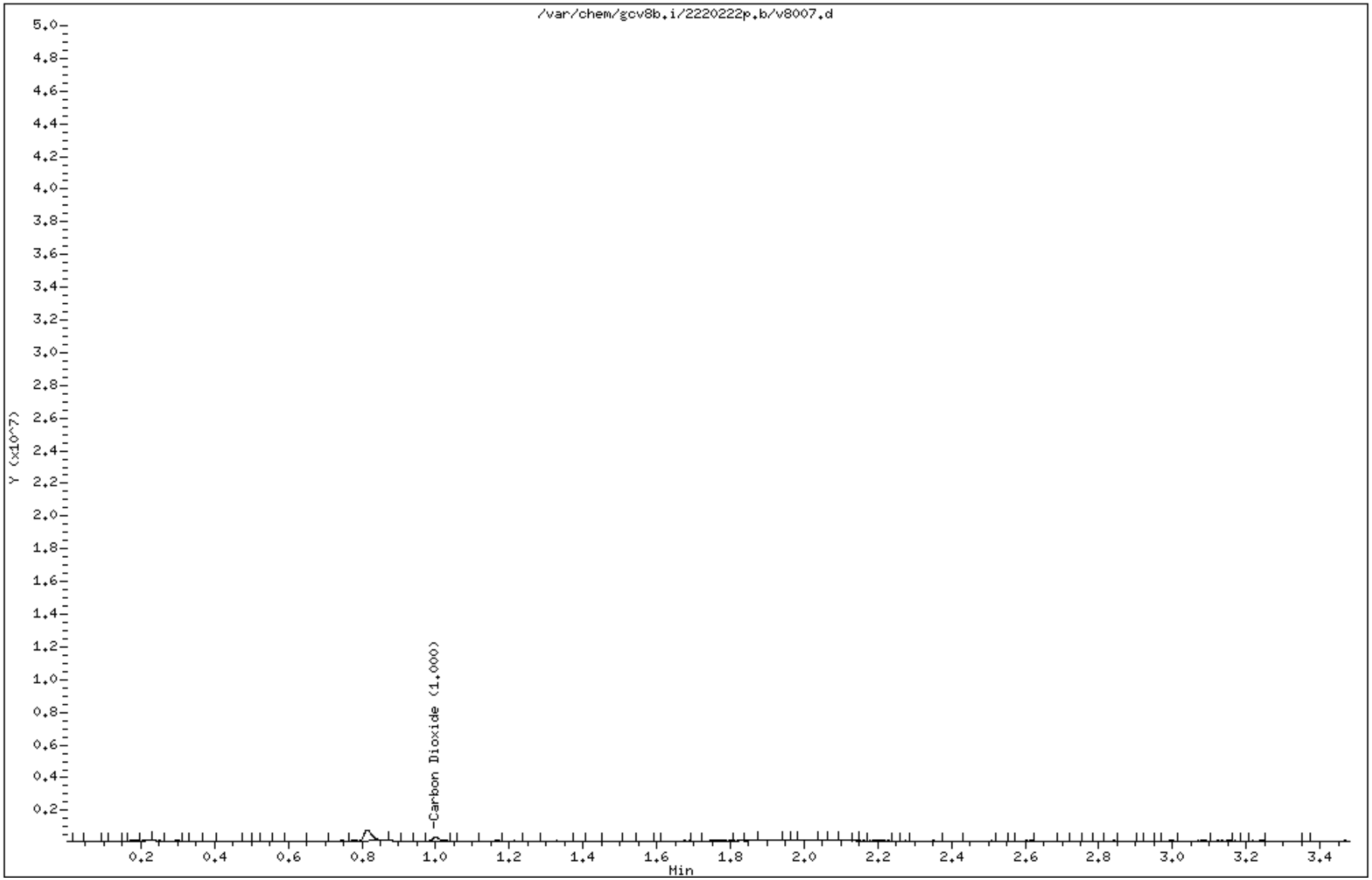
Instrument: gcv8b.i

Sample Info: 1202

Operator: AWE

Column phase: GS-Q-30

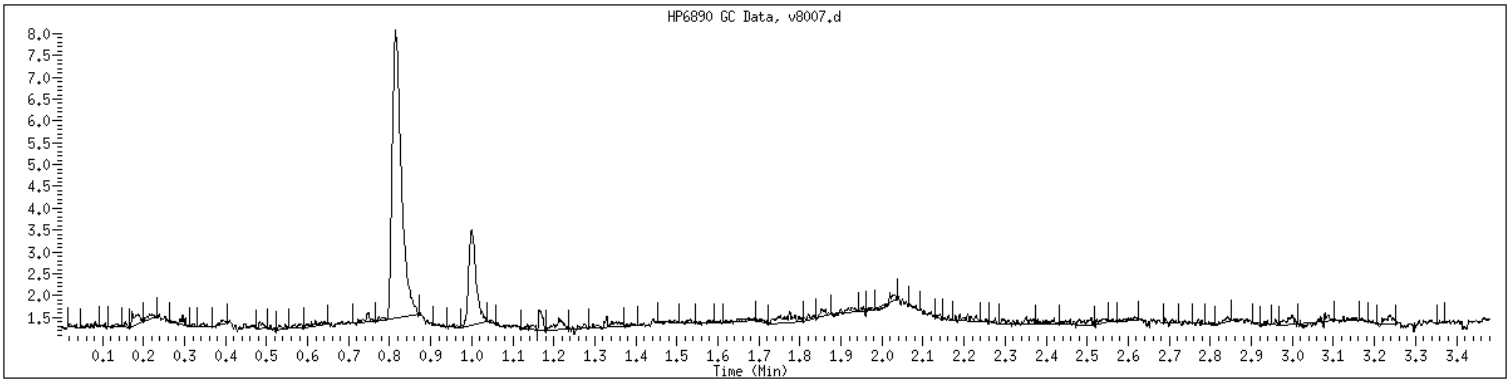
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2220222p.b/v8007.d Page: 1
Report Date: 02/23/2022 09:58

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1202	SampleType	: CALIB_2
Injection Date	: 02/22/2022 13:13	Instrument	: gcv8b.i
Operator	: AWE		
Sample Info	: 1202		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2220222p.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

Data File: /var/chem/gcv8b.i/2220222p.b/v8008.d Page 1
Report Date: 23-Feb-2022 09:58

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2220222p.b/v8008.d
Lab Smp Id: 1203
Inj Date : 22-FEB-2022 13:20
Operator : AWE Inst ID: gcv8b.i
Smp Info : 1203
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2220222p.b/CO2h.m
Meth Date : 23-Feb-2022 09:58 awe Quant Type: ESTD
Cal Date : 22-FEB-2022 13:20 Cal File: v8008.d
Als bottle: 1 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	0.999	0.999	0.000	41833869	8640.00	9750

Data File: /var/chem/gcv8b.i/2220222p.b/v8008.d

Date : 22-FEB-2022 13:20

Client ID:

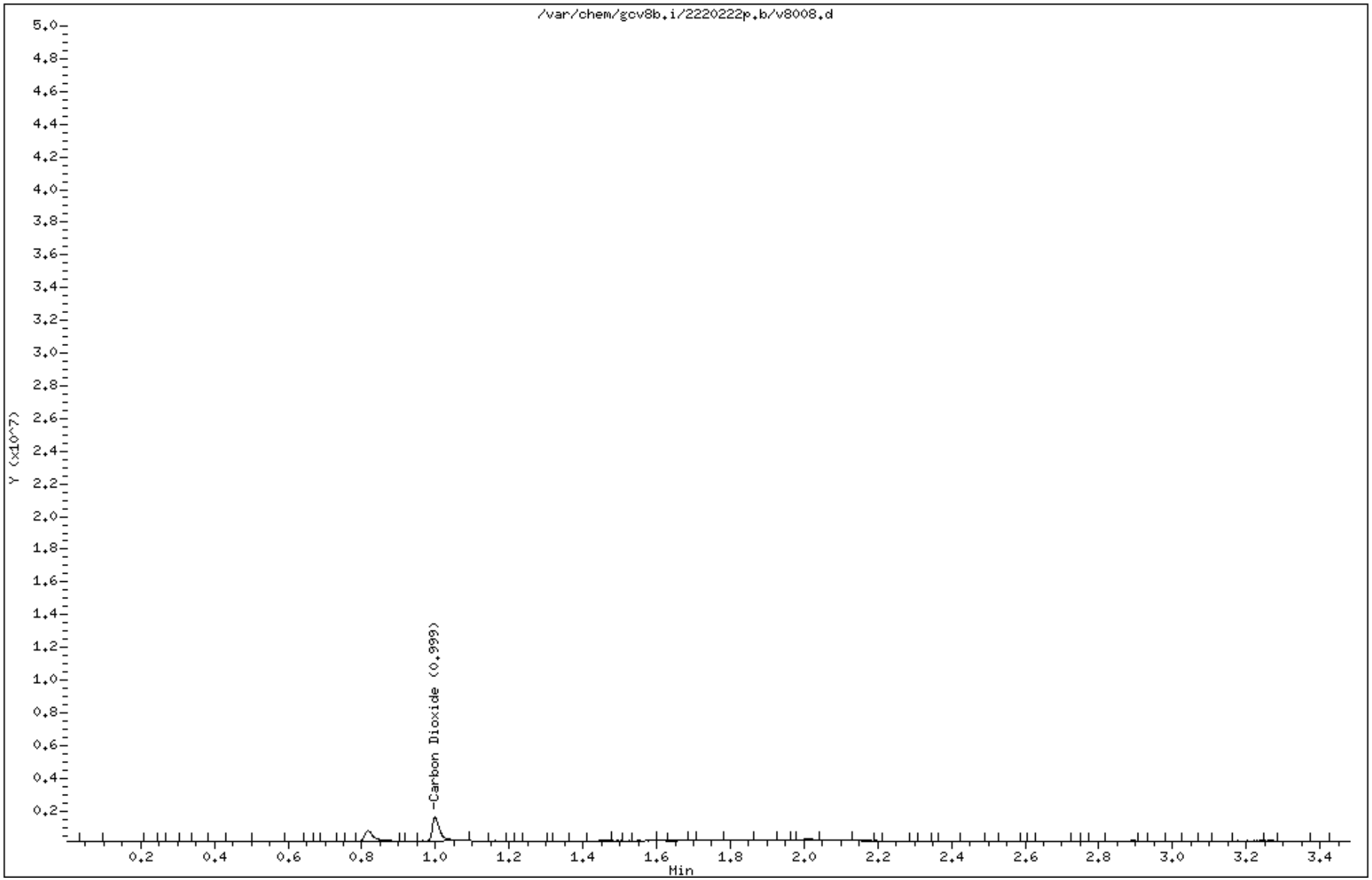
Instrument: gcv8b.i

Sample Info: 1203

Operator: AWE

Column phase: GS-Q-30

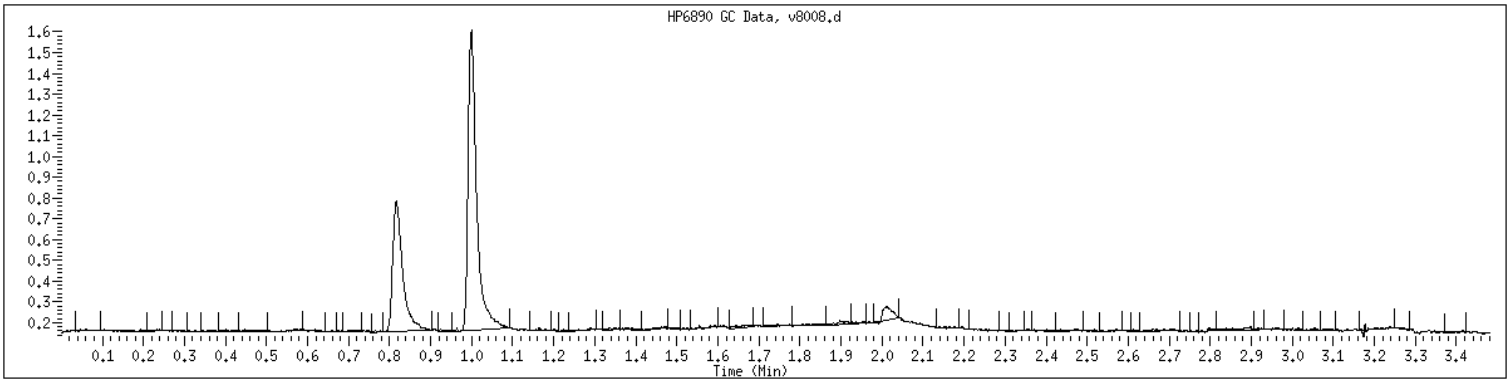
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2220222p.b/v8008.d Page: 1
Report Date: 02/23/2022 09:58

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1203	SampleType	: CALIB_3
Injection Date	: 02/22/2022 13:20	Instrument	: gcv8b.i
Operator	: AWE		
Sample Info	: 1203		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2220222p.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

Data File: /var/chem/gcv8b.i/2220222p.b/v8009.d Page 1
Report Date: 23-Feb-2022 09:58

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2220222p.b/v8009.d
Lab Smp Id: 1204
Inj Date : 22-FEB-2022 13:30
Operator : AWE Inst ID: gcv8b.i
Smp Info : 1204
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2220222p.b/CO2h.m
Meth Date : 23-Feb-2022 09:58 awe Quant Type: ESTD
Cal Date : 22-FEB-2022 13:30 Cal File: v8009.d
Als bottle: 1 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	0.996	0.996	0.000	61404735	13800.0	14300

Data File: /var/chem/gcv8b.i/2220222p.b/v8009.d

Date : 22-FEB-2022 13:30

Client ID:

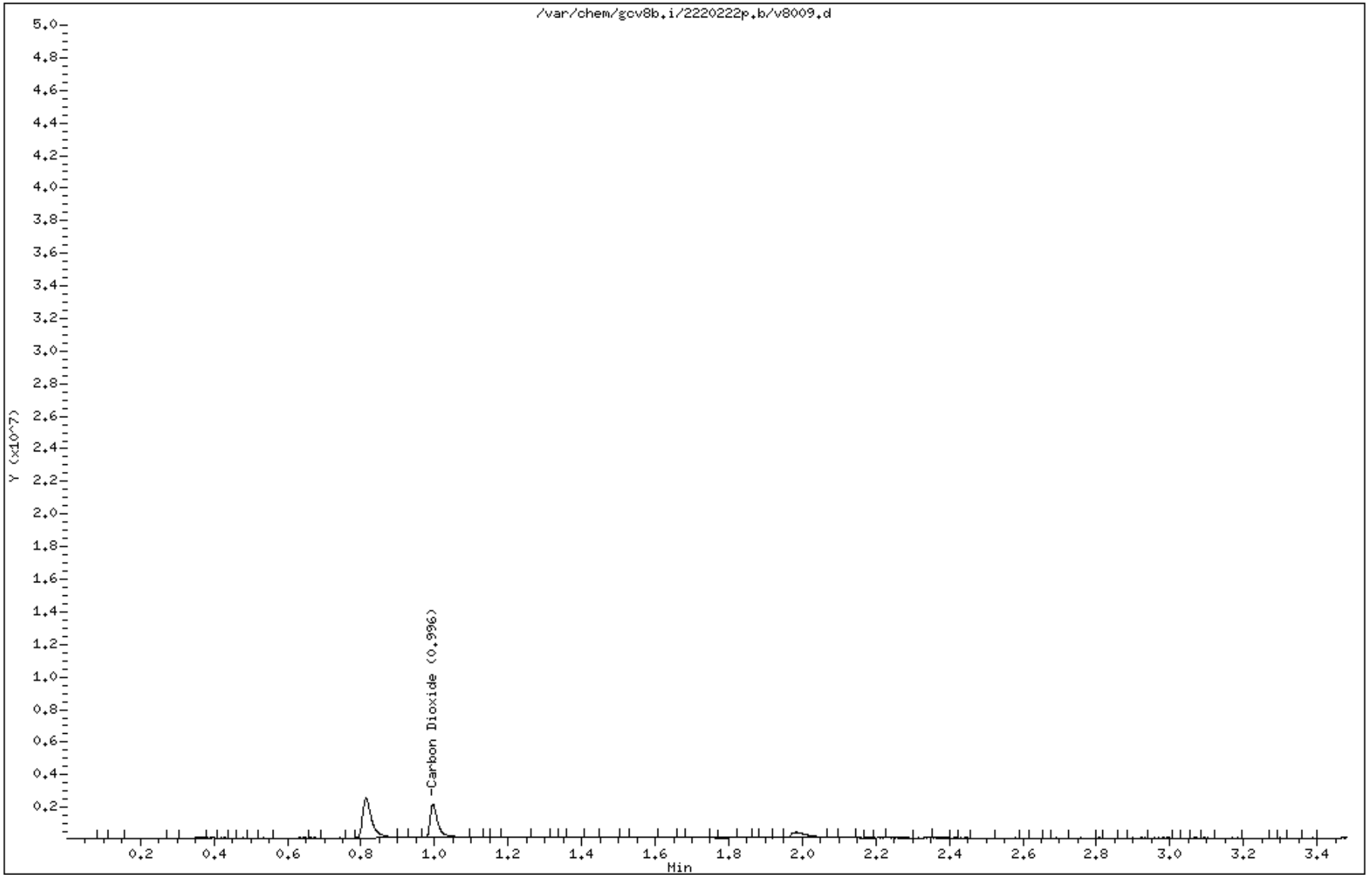
Instrument: gcv8b.i

Sample Info: 1204

Operator: AWE

Column phase: GS-Q-30

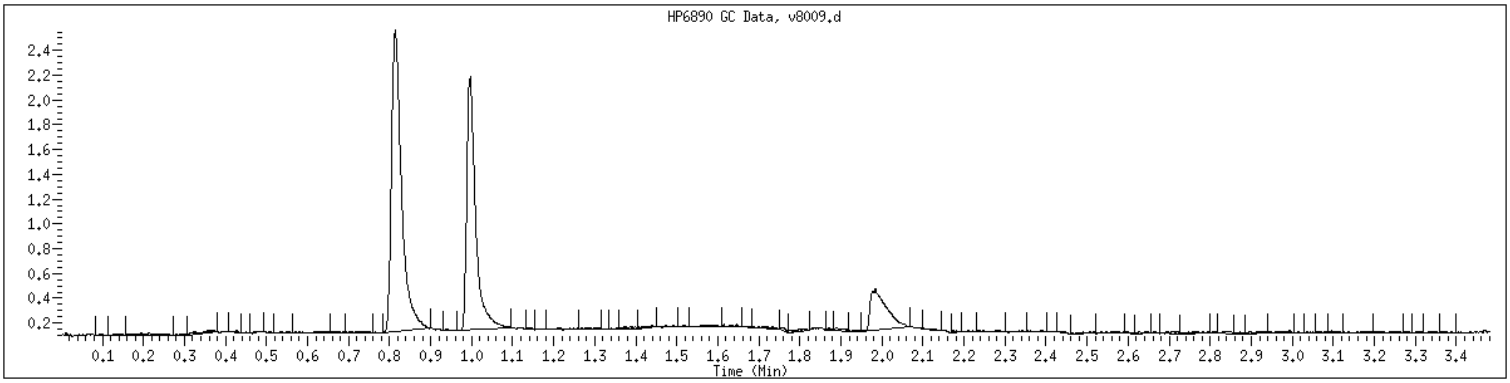
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2220222p.b/v8009.d Page: 1
Report Date: 02/23/2022 09:58

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1204	SampleType	: CALIB_4
Injection Date	: 02/22/2022 13:30	Instrument	: gcv8b.i
Operator	: AWE		
Sample Info	: 1204		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2220222p.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

Data File: /var/chem/gcv8b.i/2220222p.b/v8010.d Page 1
Report Date: 23-Feb-2022 09:58

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2220222p.b/v8010.d
Lab Smp Id: 1205
Inj Date : 22-FEB-2022 13:41
Operator : AWE Inst ID: gcv8b.i
Smp Info : 1205
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2220222p.b/CO2h.m
Meth Date : 23-Feb-2022 09:58 awe Quant Type: ESTD
Cal Date : 22-FEB-2022 13:41 Cal File: v8010.d
Als bottle: 1 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	0.992	0.992	0.000	82144349	17300.0	19100

Data File: /var/chem/gcv8b.i/2220222p.b/v8010.d

Date : 22-FEB-2022 13:41

Client ID:

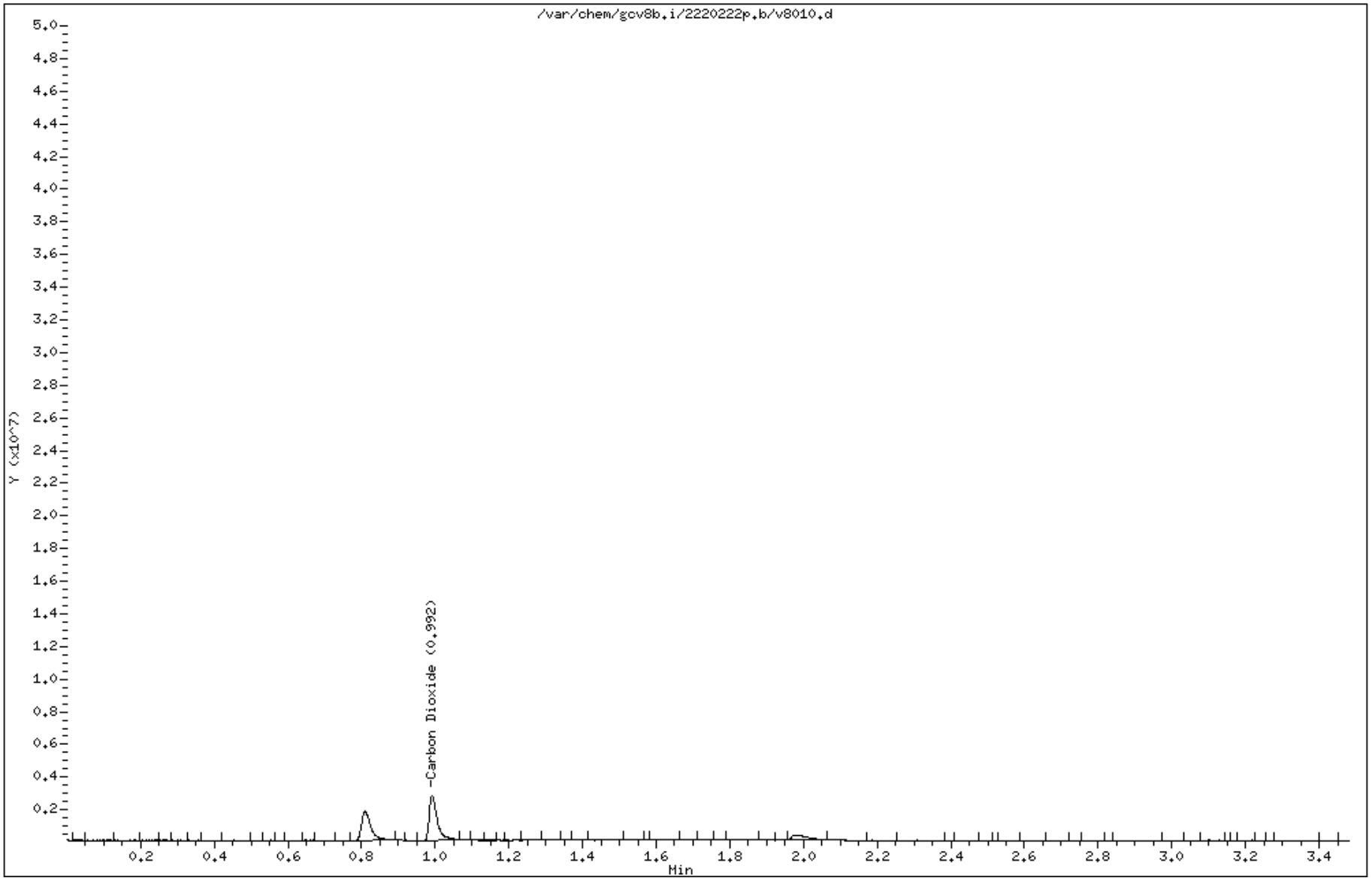
Instrument: gcv8b.i

Sample Info: 1205

Operator: AWE

Column phase: GS-Q-30

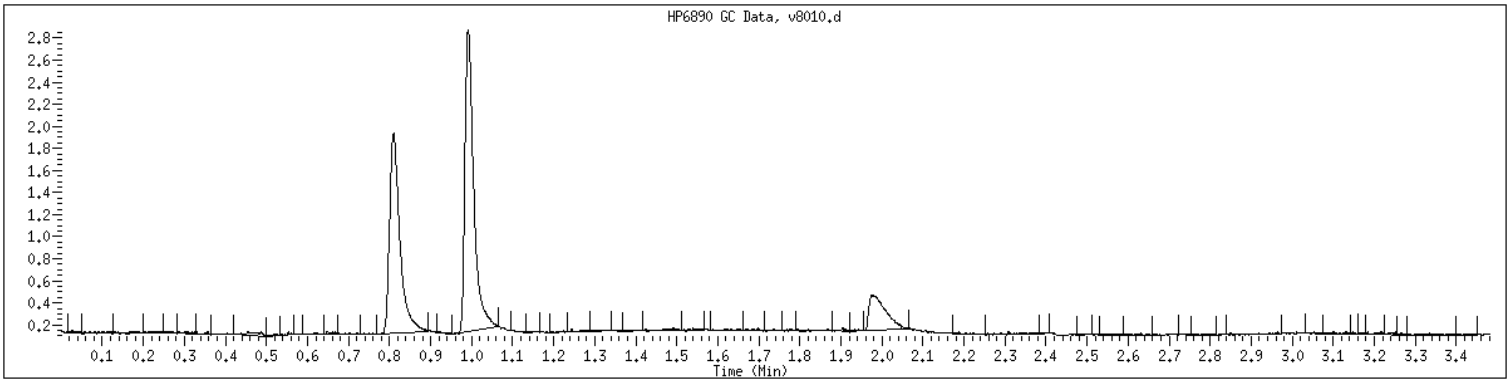
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2220222p.b/v8010.d Page: 1
Report Date: 02/23/2022 09:58

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1205	SampleType	: CALIB_5
Injection Date	: 02/22/2022 13:41	Instrument	: gcv8b.i
Operator	: AWE		
Sample Info	: 1205		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2220222p.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

EPA RSK-175

Form 6I

ICAL Verifications

6I

ORGANICS INITIAL CALIBRATION VERIFICATION

Report No:	222061111	Instrument ID:	GCV8B
Analysis Date:	02/22/22 1436	Lab File ID:	2220222p/v8011
Analytical Method:	EPA RSK-175	Analytical Batch:	734177

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*%REC*	*LCL*	*UCL*	*Q*
Carbon Dioxide	ug/L	8700	9480	109	80	120	

Data File: /var/chem/gcv8b.i/2220222p.b/v8011.d Page 1
Report Date: 23-Feb-2022 09:58

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2220222p.b/v8011.d
Lab Smp Id: 1600
Inj Date : 22-FEB-2022 14:36
Operator : AWE Inst ID: gcv8b.i
Smp Info : 1600
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2220222p.b/CO2h.m
Meth Date : 23-Feb-2022 09:58 awe Quant Type: ESTD
Cal Date : 22-FEB-2022 13:41 Cal File: v8010.d
Als bottle: 1 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	0.996	0.992	0.004	40668641	9478.37	9480

Data File: /var/chem/gcv8b.i/2220222p.b/v8011.d

Date : 22-FEB-2022 14:36

Client ID:

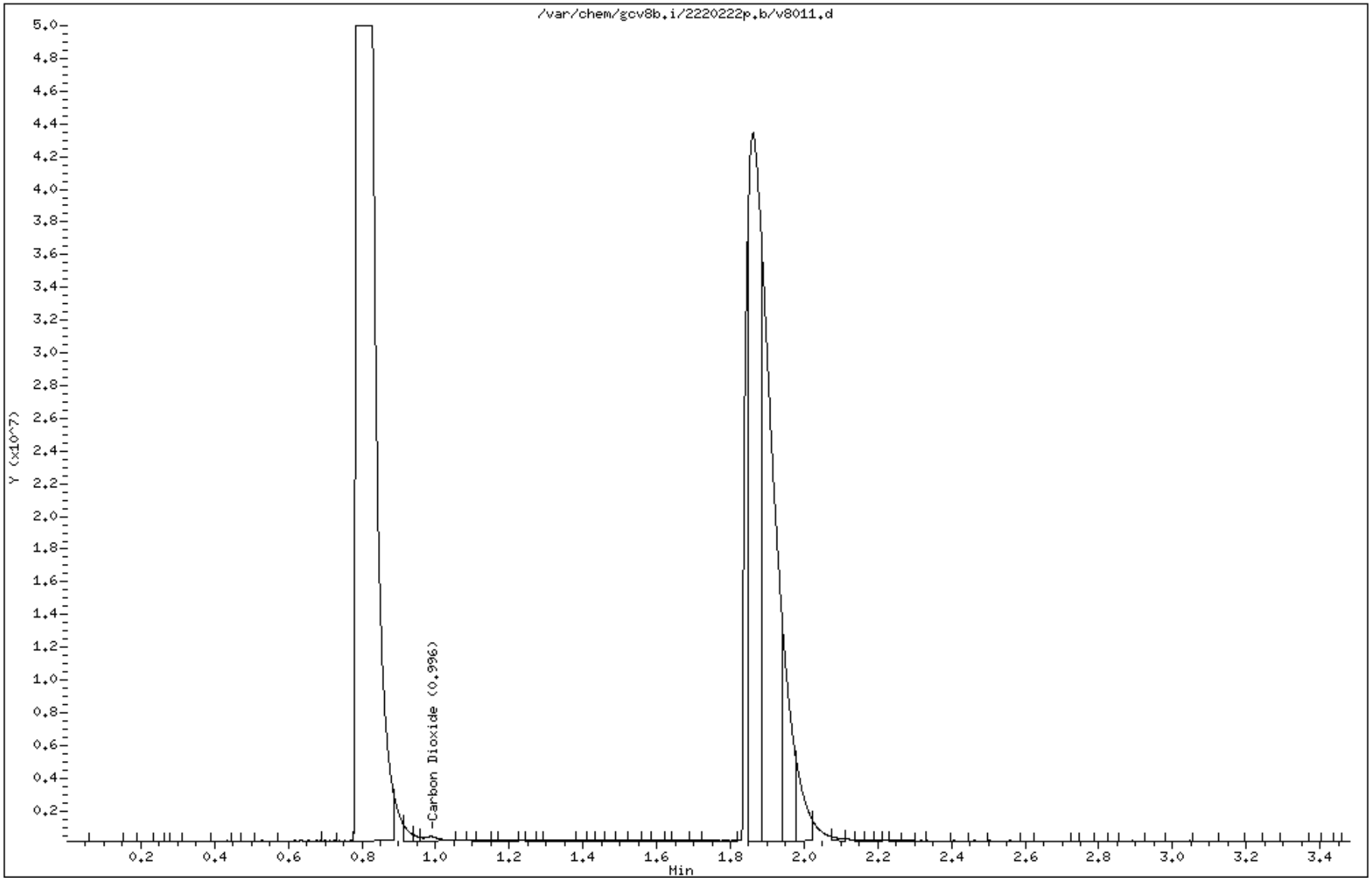
Instrument: gcv8b.i

Sample Info: 1600

Operator: AWE

Column phase: GS-Q-30

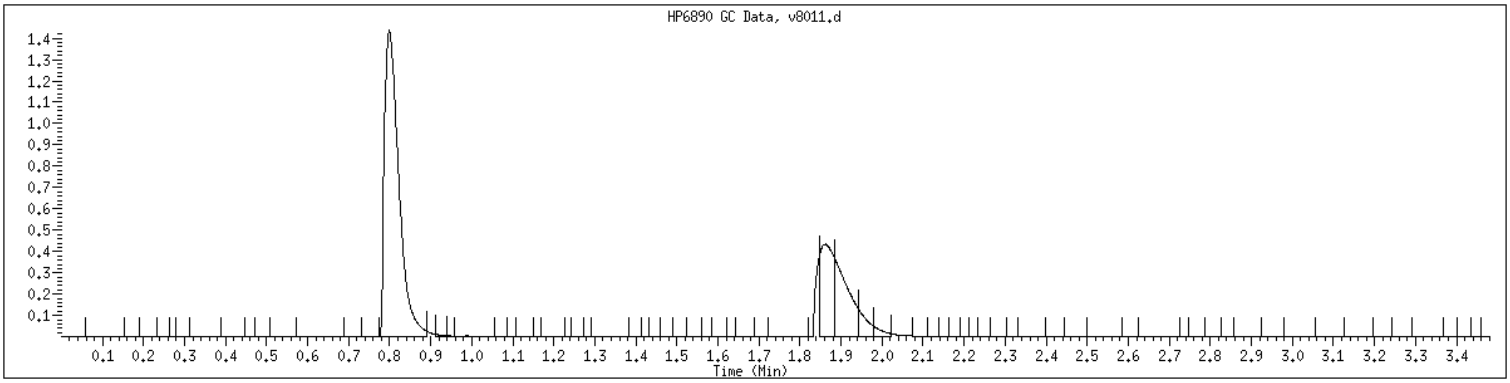
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2220222p.b/v8011.d Page: 1
Report Date: 02/23/2022 09:58

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1600	SampleType	: LCS
Injection Date	: 02/22/2022 14:36	Instrument	: gcv8b.i
Operator	: AWE		
Sample Info	: 1600		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2220222p.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

EPA RSK-175

Form 7E

CCAL Verifications

7E

ORGANICS CONTINUING CALIBRATION CHECK

Report No:	222061111			CCAL ID:	1400
GC Column:	GS-Q-30	ID: .53	(mm)	Instrument ID:	GCV8B
Injection Vol.:	1.0		(µL)	Lab File ID:	2220614/v8002
Init. Calib. Date 1:	02/22/22	Time 1: 1306		Analyst:	BDP
Init. Calib. Date 2:	02/22/22	Time 2: 1341		Analytical Batch:	743215
Analysis Date:	06/14/22	Time: 0857		Analytical Method:	RSK-175

ANALYTE	*$\overline{RRF}$*	*RRF CCV*	*%D/%Drift*	*Max %D/ % Drift*	*TYPE*	*Q*
Carbon Dioxide	4291	5097	-18.7	20	A	

FORM V II SV

Data File: /var/chem/gcv8b.i/2220614.b/v8002.d Page 1
Report Date: 14-Jun-2022 16:32

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2220614.b/v8002.d
Lab Smp Id: 1400
Inj Date : 14-JUN-2022 08:57
Operator : BDP Inst ID: gcv8b.i
Smp Info : 1400
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2220614.b/CO2h.m
Meth Date : 14-Jun-2022 16:32 awe Quant Type: ESTD
Cal Date : 22-FEB-2022 13:41 Cal File: v8010.d
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	0.999	0.999	0.000	44034020	8640.00	10300

Data File: /var/chem/gcv8b.i/2220614.b/v8002.d

Date : 14-JUN-2022 08:57

Client ID:

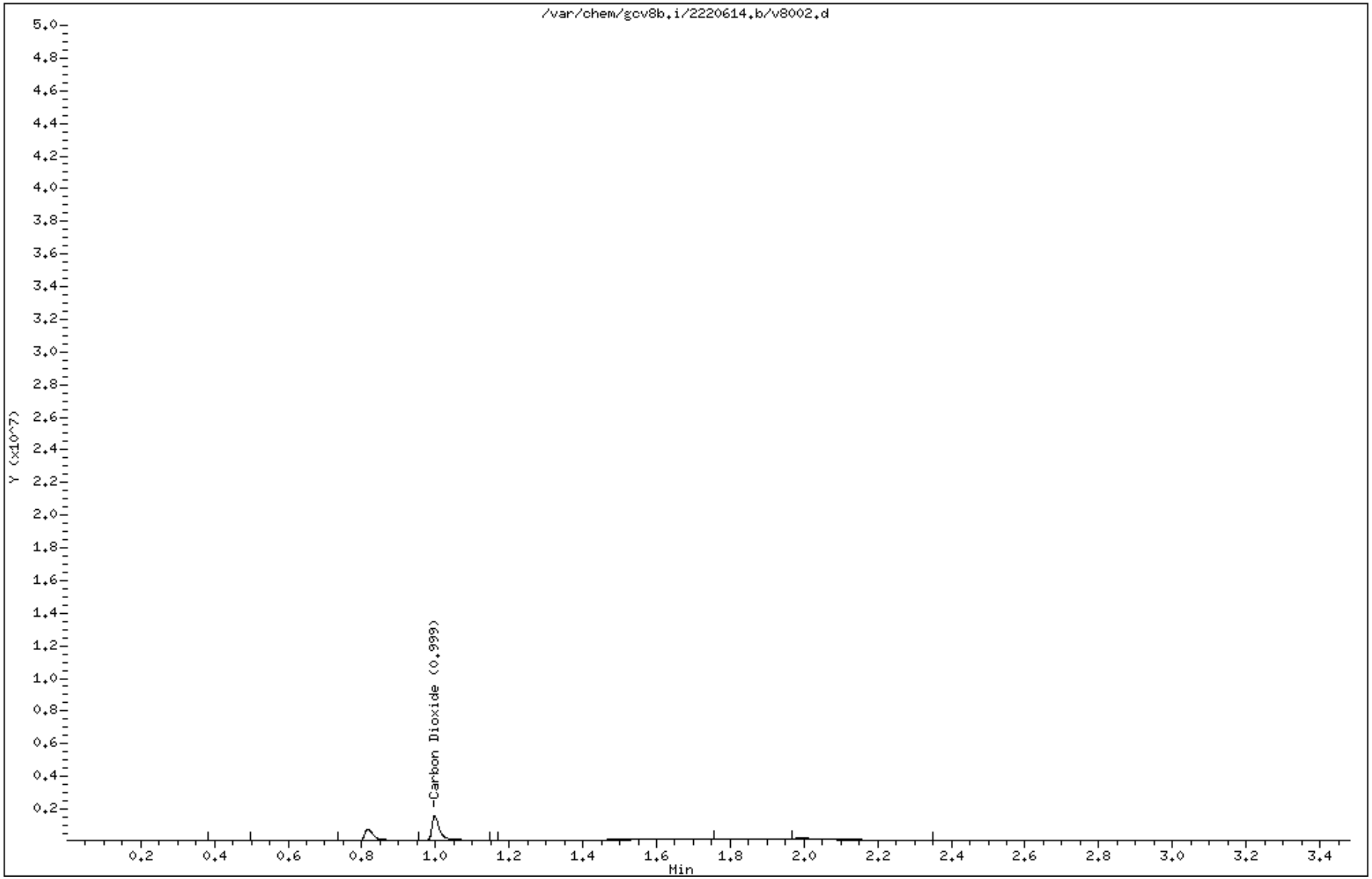
Instrument: gcv8b.i

Sample Info: 1400

Operator: BDP

Column phase: GS-Q-30

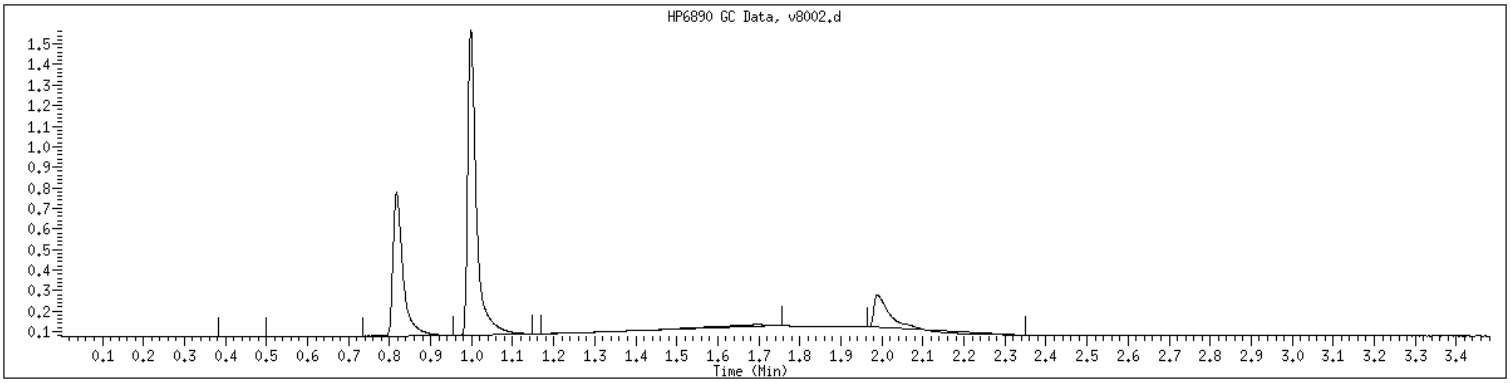
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2220614.b/v8002.d Page: 1
Report Date: 06/14/2022 16:32

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1400	SampleType	: CCALIB_3
Injection Date	: 06/14/2022 08:57	Instrument	: gcv8b.i
Operator	: BDP		
Sample Info	: 1400		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2220614.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

7E

ORGANICS CONTINUING CALIBRATION CHECK

Report No:	222061111			CCAL ID:	1400
GC Column:	GS-Q-30	ID: .53	(mm)	Instrument ID:	GCV8B
Injection Vol.:	1.0		(µL)	Lab File ID:	2220614/v8021
Init. Calib. Date 1:	02/22/22	Time 1: 1306		Analyst:	BDP
Init. Calib. Date 2:	02/22/22	Time 2: 1341		Analytical Batch:	743215
Analysis Date:	06/14/22	Time: 1314		Analytical Method:	RSK-175

ANALYTE	$\overline{RRF}$	RRF CCV	%D/%Drift	Max %D/ % Drift	TYPE	Q
Carbon Dioxide	4291	4806	-12	20	A	

FORM V II SV

Data File: /var/chem/gcv8b.i/2220614.b/v8021.d Page 1
Report Date: 14-Jun-2022 16:32

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2220614.b/v8021.d
Lab Smp Id: 1400
Inj Date : 14-JUN-2022 13:14
Operator : BDP Inst ID: gcv8b.i
Smp Info : 1400
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2220614.b/CO2h.m
Meth Date : 14-Jun-2022 16:32 awe Quant Type: ESTD
Cal Date : 22-FEB-2022 13:41 Cal File: v8010.d
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
==========	==	======	======	========	=======	=======
1 Carbon Dioxide	0.996	0.996	0.000	41519816	8640.00	9680

Data File: /var/chem/gcv8b.i/2220614.b/v8021.d

Date : 14-JUN-2022 13:14

Client ID:

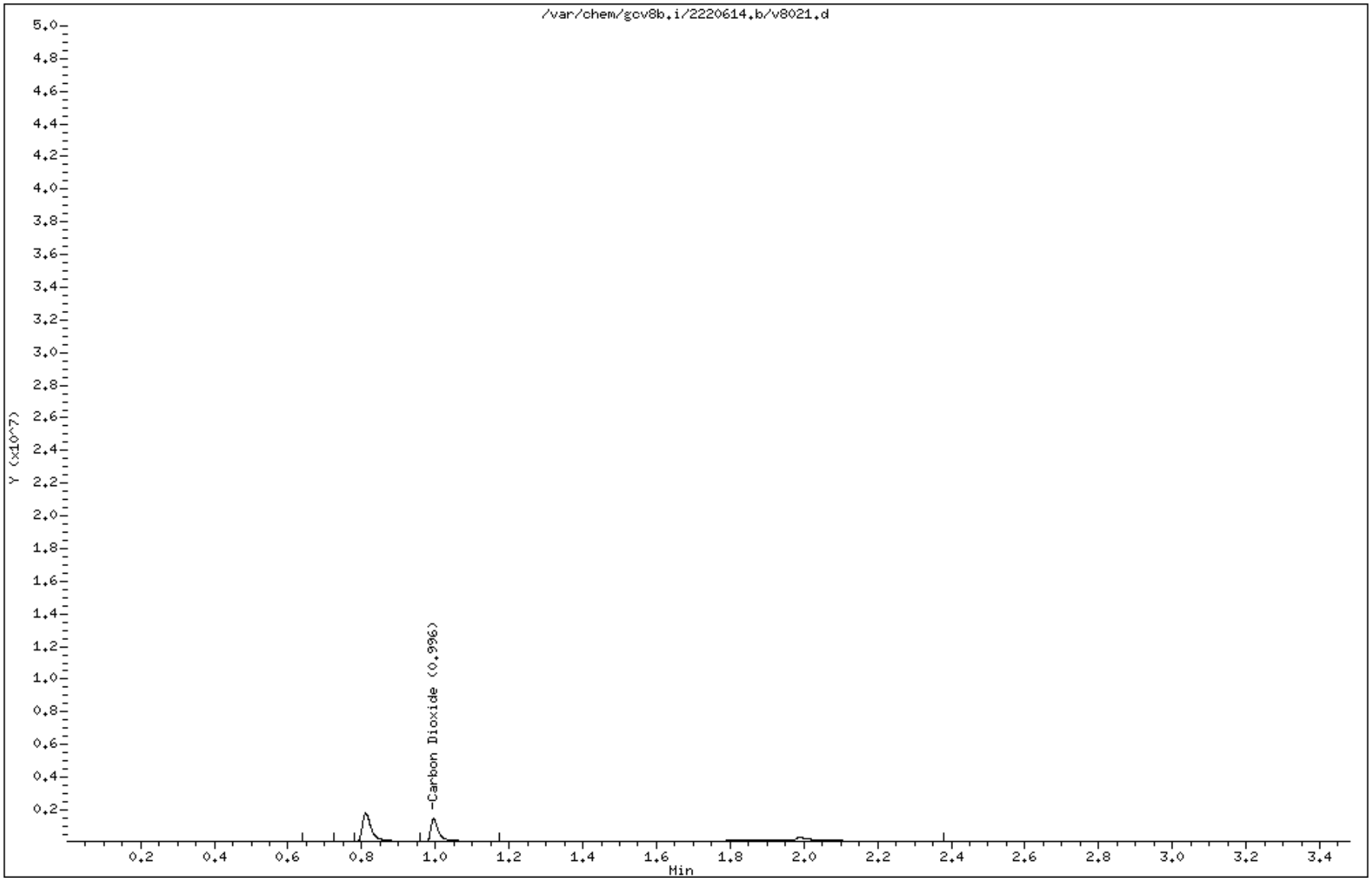
Instrument: gcv8b.i

Sample Info: 1400

Operator: BDP

Column phase: GS-Q-30

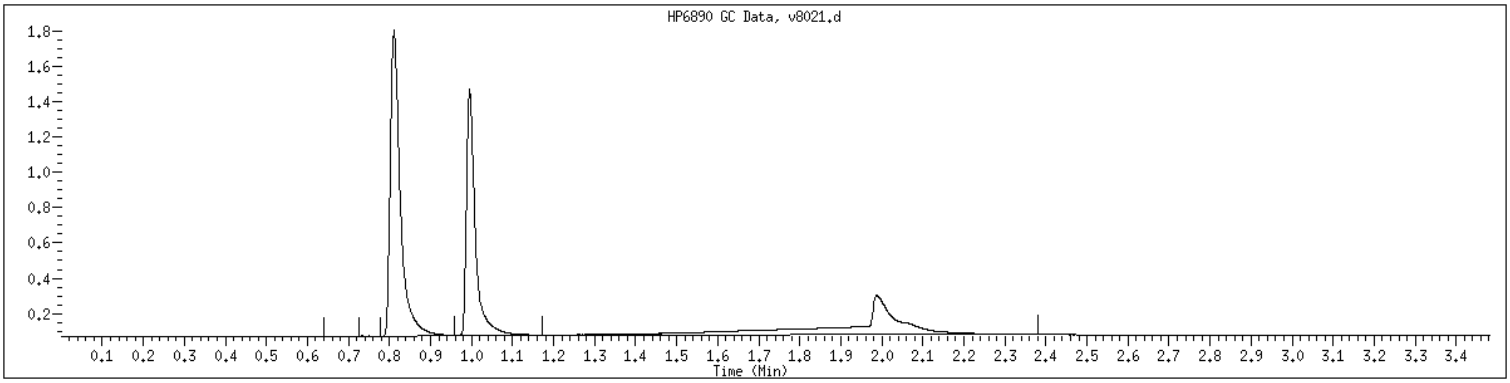
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2220614.b/v8021.d Page: 1
Report Date: 06/14/2022 16:32

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1400	SampleType	: CCALIB_3
Injection Date	: 06/14/2022 13:14	Instrument	: gcv8b.i
Operator	: BDP		
Sample Info	: 1400		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2220614.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

7E

ORGANICS CONTINUING CALIBRATION CHECK

Report No:	222061111			CCAL ID:	1400
GC Column:	GS-Q-30	ID: .53	(mm)	Instrument ID:	GCV8B
Injection Vol.:	1.0		(µL)	Lab File ID:	2220614/v8031
Init. Calib. Date 1:	02/22/22	Time 1: 1306		Analyst:	BDP
Init. Calib. Date 2:	02/22/22	Time 2: 1341		Analytical Batch:	743215
Analysis Date:	06/14/22	Time: 1451		Analytical Method:	RSK-175

ANALYTE	$\overline{RRF}$	RRF CCV	%D/%Drift	Max %D/ % Drift	TYPE	Q
Carbon Dioxide	4291	4901	-14.2	20	A	

FORM V II SV

Data File: /var/chem/gcv8b.i/2220614.b/v8031.d Page 1
Report Date: 14-Jun-2022 16:32

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2220614.b/v8031.d
Lab Smp Id: 1400
Inj Date : 14-JUN-2022 14:51
Operator : BDP Inst ID: gcv8b.i
Smp Info : 1400
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2220614.b/CO2h.m
Meth Date : 14-Jun-2022 16:32 awe Quant Type: ESTD
Cal Date : 22-FEB-2022 13:41 Cal File: v8010.d
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
==========	==	======	======	========	=======	=======
1 Carbon Dioxide	0.996	0.996	0.000	42348273	8640.00	9870

Data File: /var/chem/gcv8b.i/2220614.b/v8031.d

Date : 14-JUN-2022 14:51

Client ID:

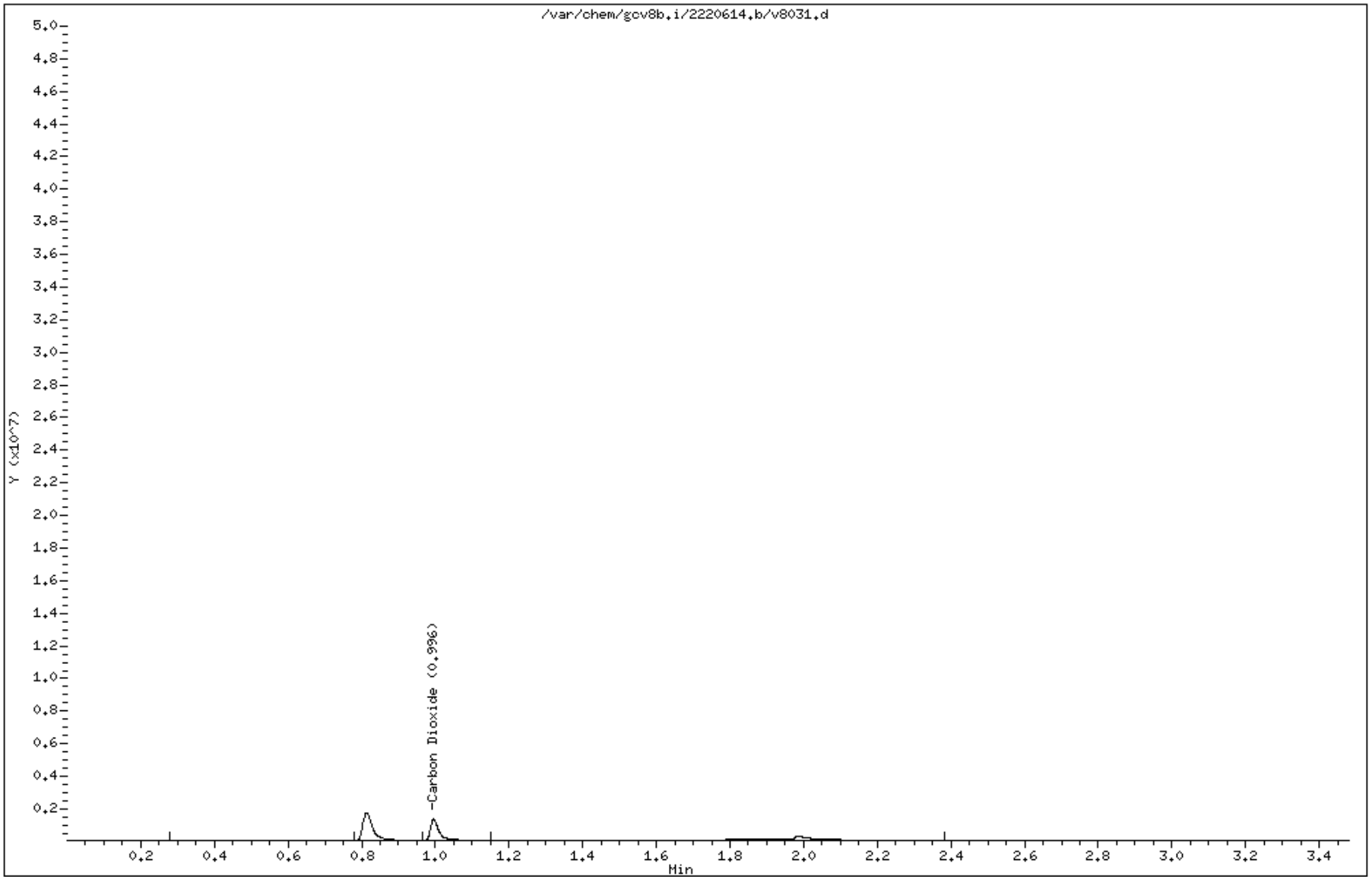
Instrument: gcv8b.i

Sample Info: 1400

Operator: BDP

Column phase: GS-Q-30

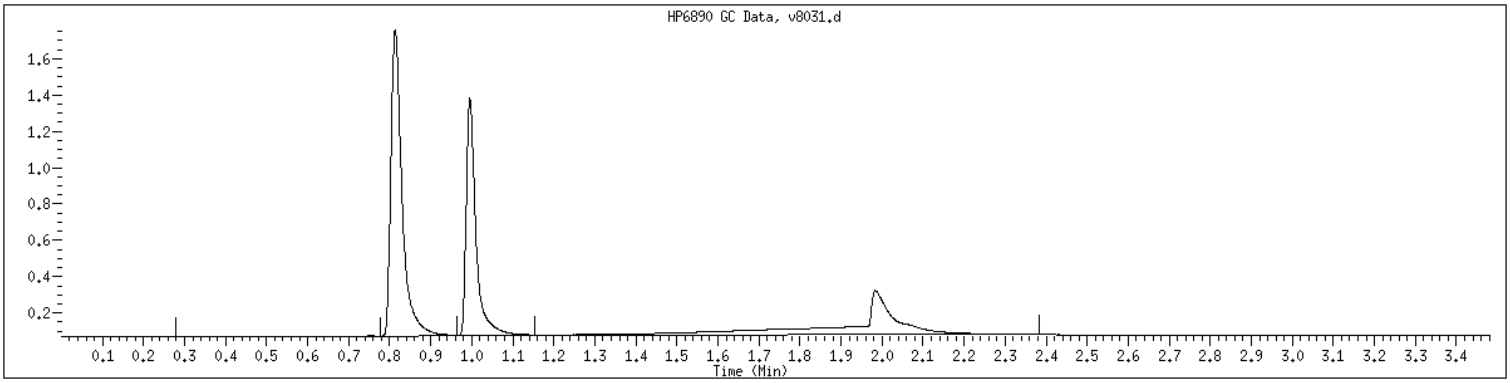
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2220614.b/v8031.d Page: 1
Report Date: 06/14/2022 16:32

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1400	SampleType	: CCALIB_3
Injection Date	: 06/14/2022 14:51	Instrument	: gcv8b.i
Operator	: BDP		
Sample Info	: 1400		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2220614.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

7E

ORGANICS CONTINUING CALIBRATION CHECK

Report No:	222061111			CCAL ID:	1400
GC Column:	GS-Q-30	ID: .53	(mm)	Instrument ID:	GCV8B
Injection Vol.:	1.0		(µL)	Lab File ID:	2220614/v8040
Init. Calib. Date 1:	02/22/22	Time 1: 1306		Analyst:	BDP
Init. Calib. Date 2:	02/22/22	Time 2: 1341		Analytical Batch:	743215
Analysis Date:	06/14/22	Time: 1559		Analytical Method:	RSK-175

ANALYTE	*$\overline{RRF}$*	*RRF CCV*	*%D/%Drift*	*Max %D/ % Drift*	*TYPE*	*Q*
Carbon Dioxide	4291	4811	-12.1	20	A	

FORM V II SV

Data File: /var/chem/gcv8b.i/2220614.b/v8040.d Page 1
Report Date: 14-Jun-2022 16:32

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2220614.b/v8040.d
Lab Smp Id: 1400
Inj Date : 14-JUN-2022 15:59
Operator : BDP Inst ID: gcv8b.i
Smp Info : 1400
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2220614.b/CO2h.m
Meth Date : 14-Jun-2022 16:32 awe Quant Type: ESTD
Cal Date : 22-FEB-2022 13:41 Cal File: v8010.d
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.003	1.003	0.000	41566935	8640.00	9690

Data File: /var/chem/gcv8b.i/2220614.b/v8040.d

Page 1

Date : 14-JUN-2022 15:59

Client ID:

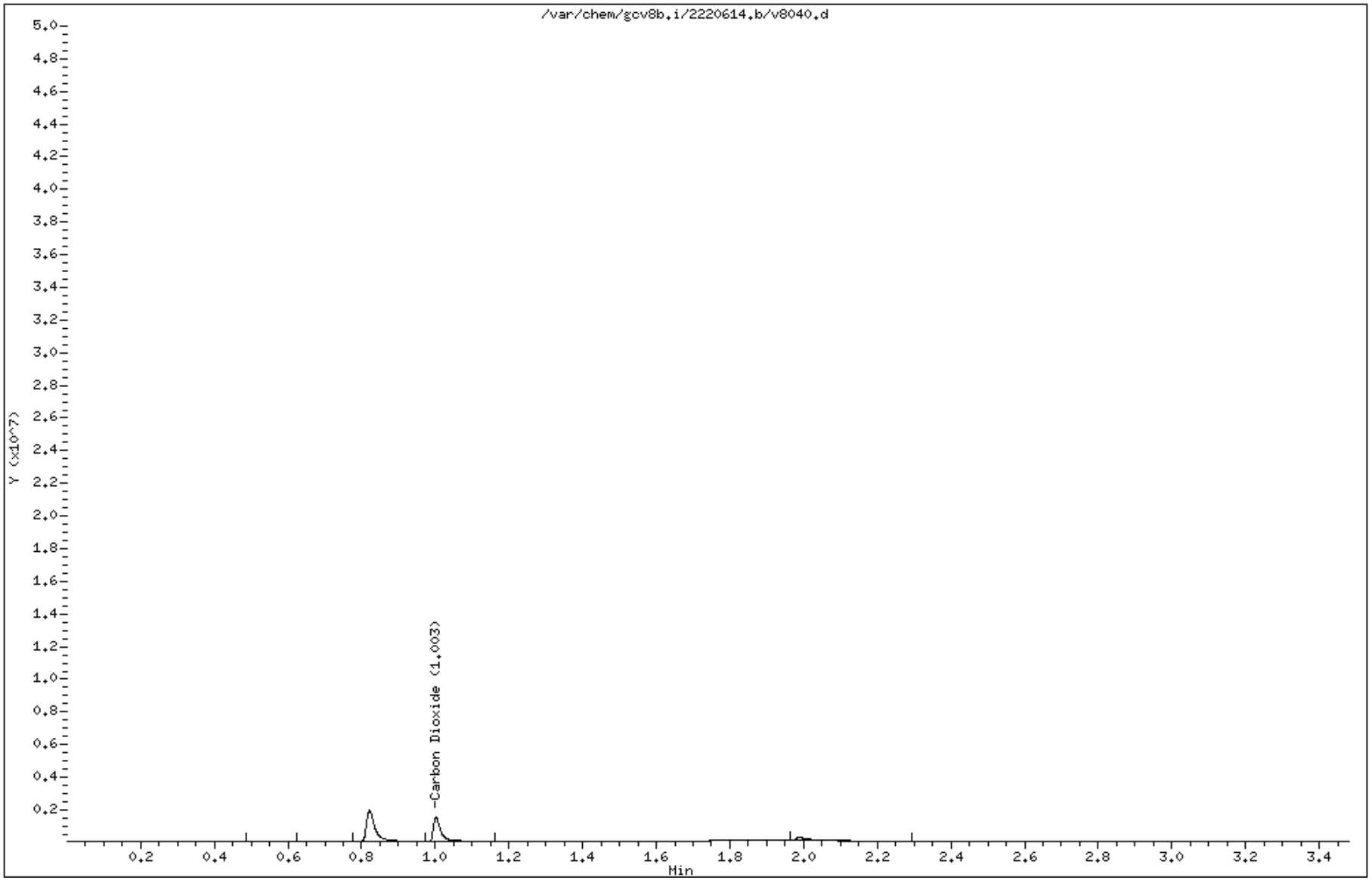
Instrument: gcv8b.i

Sample Info: 1400

Operator: BDP

Column phase: GS-Q-30

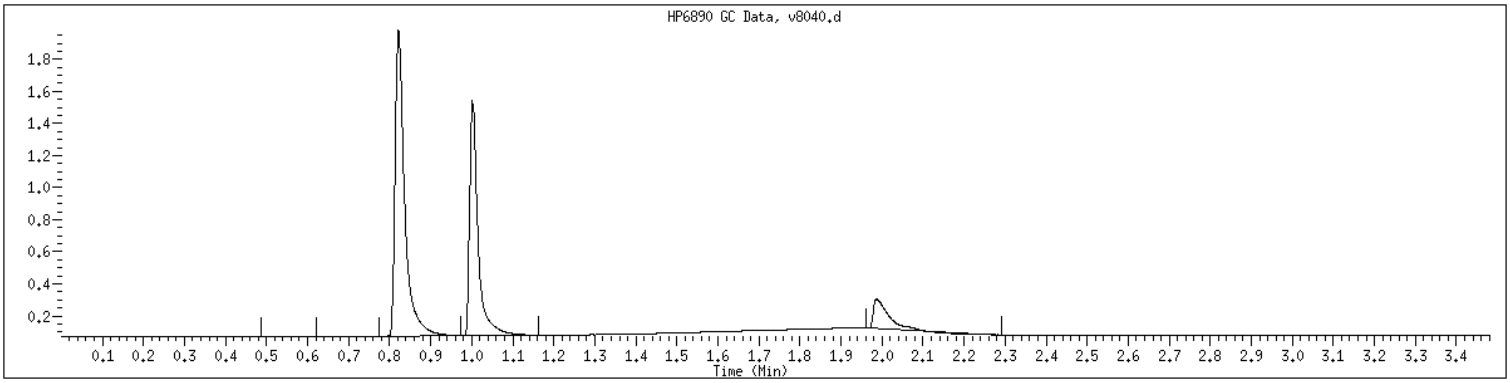
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2220614.b/v8040.d Page: 1
Report Date: 06/14/2022 16:32

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1400	SampleType	: CCALIB_3
Injection Date	: 06/14/2022 15:59	Instrument	: gcv8b.i
Operator	: BDP		
Sample Info	: 1400		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2220614.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

EPA RSK-175

RunLogs

LABORATORY CHRONICLE: GCV DEPARTMENT

Date: 02/23/2022
Instrument: gcv8b.i
Method File: /var/chem/gcv8b.i/2220222p.b/CO2h.m
Batch: /var/chem/gcv8b.i/2220222p.b
Column-Detector: GS-Q-30

Sample ID	Method	DataFile	Wgt/Vol	Injection Time	Dil	Anal	ALS	Comments
1201	CO2h.m	v8001.d	0.00 ml	22-FEB-2022 12:03	1.0	AWE	1	co2
1202	CO2h.m	v8002.d	0.00 ml	22-FEB-2022 12:17	1.0	AWE	1	co2
1203	CO2h.m	v8003.d	0.00 ml	22-FEB-2022 12:30	1.0	AWE	1	co2
1204	CO2h.m	v8004.d	0.00 ml	22-FEB-2022 12:37	1.0	AWE	1	co2
1205	CO2h.m	v8005.d	0.00 ml	22-FEB-2022 12:45	1.0	AWE	1	co2
1201	CO2h.m	v8006.d	0.00 ml	22-FEB-2022 13:06	1.0	AWE	1	co2
1202	CO2h.m	v8007.d	0.00 ml	22-FEB-2022 13:13	1.0	AWE	1	co2
1203	CO2h.m	v8008.d	0.00 ml	22-FEB-2022 13:20	1.0	AWE	1	co2
1204	CO2h.m	v8009.d	0.00 ml	22-FEB-2022 13:30	1.0	AWE	1	co2
1205	CO2h.m	v8010.d	0.00 ml	22-FEB-2022 13:41	1.0	AWE	1	co2
1600	CO2h.m	v8011.d	0.00 ml	22-FEB-2022 14:36	1.0	AWE	1	co2
LCS	CO2h.m	v8012.d	0.00 ml	22-FEB-2022 15:37	1.0	AWE	1	co2
LCSD	CO2h.m	v8013.d	0.00 ml	22-FEB-2022 15:47	1.0	AWE	1	co2
LCS	CO2h.m	v8014.d	0.00 ml	22-FEB-2022 16:04	1.0	AWE	1	co2
LCS	CO2h.m	v8015.d	0.00 ml	22-FEB-2022 16:25	1.0	AWE	1	co2
BLANK	CO2h.m	v8016.d	0.00 ml	22-FEB-2022 16:32	1.0	AWE	1	co2
22202093601	CO2h.m	v8017.d	0.00 ml	22-FEB-2022 17:13	10.0	AWE	1	co2
22202093602	CO2h.m	v8018.d	0.00 ml	22-FEB-2022 17:22	10.0	AWE	1	co2
22202093603	CO2h.m	v8019.d	0.00 ml	22-FEB-2022 17:30	10.0	AWE	1	co2
22202093604	CO2h.m	v8020.d	0.00 ml	22-FEB-2022 17:37	10.0	AWE	1	co2
22202093605	CO2h.m	v8021.d	0.00 ml	22-FEB-2022 17:43	10.0	AWE	1	co2
22202093606	CO2h.m	v8022.d	0.00 ml	22-FEB-2022 18:09	1.0	AWE	1	co2
22202093607	CO2h.m	v8023.d	0.00 ml	22-FEB-2022 18:15	1.0	AWE	1	co2
22202106101	CO2h.m	v8024.d	0.00 ml	22-FEB-2022 18:24	50.0	AWE	1	co2
22202106102	CO2h.m	v8025.d	0.00 ml	22-FEB-2022 18:33	50.0	AWE	1	co2
22202106103	CO2h.m	v8026.d	0.00 ml	22-FEB-2022 18:43	50.0	AWE	1	co2
22202106104	CO2h.m	v8027.d	0.00 ml	22-FEB-2022 18:50	50.0	AWE	1	co2
22202106301	CO2h.m	v8028.d	0.00 ml	22-FEB-2022 18:57	50.0	AWE	1	co2
22202106302	CO2h.m	v8029.d	0.00 ml	22-FEB-2022 19:05	50.0	AWE	1	co2
22202106303	CO2h.m	v8030.d	0.00 ml	22-FEB-2022 19:12	1.0	AWE	1	co2
22202106304	CO2h.m	v8031.d	0.00 ml	22-FEB-2022 19:19	1.0	AWE	1	co2
22202106305	CO2h.m	v8032.d	0.00 ml	22-FEB-2022 19:30	1.0	AWE	1	co2
22202106306	CO2h.m	v8033.d	0.00 ml	22-FEB-2022 19:39	1.0	AWE	1	co2
22202106307	CO2h.m	v8034.d	0.00 ml	22-FEB-2022 19:47	1.0	AWE	1	co2
1400	CO2h.m	v8035.d	0.00 ml	22-FEB-2022 19:54	1.0	AWE	1	co2

LABORATORY CHRONICLE: GCV DEPARTMENT

Date: 06/14/2022
Instrument: gcv8b.i
Method File: /var/chem/gcv8b.i/2220614.b/CO2h.m
Batch: /var/chem/gcv8b.i/2220614.b
Column-Detector: GS-Q-30

Sample ID	Method	DataFile	Wgt/Vol	Injection Time	Dil	Anal	ALS	Comments
1400	CO2h.m	v8002.d	0.00 ml	14-JUN-2022 08:57	1.0	BDP	1	co2
LCS	CO2h.m	v8003.d	0.00 ml	14-JUN-2022 09:23	1.0	BDP	1	co2
LCS	CO2h.m	v8004.d	0.00 ml	14-JUN-2022 09:36	1.0	BDP	1	co2
2358566	CO2h.m	v8005.d	0.00 ml	14-JUN-2022 09:45	1.0	BDP	1	co2
2358567	CO2h.m	v8006.d	0.00 ml	14-JUN-2022 09:52	1.0	BDP	1	co2
	CO2h.m	v8007.d	0.00 ml	14-JUN-2022 10:13	1.0	BDP	1	co2
2358565	CO2h.m	v8008.d	0.00 ml	14-JUN-2022 10:24	1.0	BDP	1	co2
22206113101	CO2h.m	v8009.d	0.00 ml	14-JUN-2022 11:16	20.0	BDP	1	co2
22206113102	CO2h.m	v8010.d	0.00 ml	14-JUN-2022 11:22	20.0	BDP	1	co2
22206113102	CO2h.m	v8011.d	0.00 ml	14-JUN-2022 11:27	10.0	BDP	1	co2
22206113103	CO2h.m	v8012.d	0.00 ml	14-JUN-2022 11:33	10.0	BDP	1	co2
22206113104	CO2h.m	v8013.d	0.00 ml	14-JUN-2022 11:41	10.0	BDP	1	co2
22206111301	CO2h.m	v8014.d	0.00 ml	14-JUN-2022 11:47	10.0	BDP	1	co2
22206111302	CO2h.m	v8015.d	0.00 ml	14-JUN-2022 11:54	10.0	BDP	1	co2
22206111303	CO2h.m	v8016.d	0.00 ml	14-JUN-2022 12:03	10.0	BDP	1	co2
22206111304	CO2h.m	v8017.d	0.00 ml	14-JUN-2022 12:09	10.0	BDP	1	co2
22206111305	CO2h.m	v8018.d	0.00 ml	14-JUN-2022 12:16	10.0	BDP	1	co2
1400	CO2h.m	v8019.d	0.00 ml	14-JUN-2022 12:23	1.0	BDP	1	co2
1400	CO2h.m	v8020.d	0.00 ml	14-JUN-2022 13:07	1.0	BDP	1	co2
1400	CO2h.m	v8021.d	0.00 ml	14-JUN-2022 13:14	1.0	BDP	1	co2
22206104401	CO2h.m	v8022.d	0.00 ml	14-JUN-2022 13:19	10.0	BDP	1	co2
22206104402	CO2h.m	v8023.d	0.00 ml	14-JUN-2022 13:33	10.0	BDP	1	co2
22206104403	CO2h.m	v8024.d	0.00 ml	14-JUN-2022 13:40	1.0	BDP	1	co2
22206104404	CO2h.m	v8025.d	0.00 ml	14-JUN-2022 13:45	10.0	BDP	1	co2
22206104405	CO2h.m	v8026.d	0.00 ml	14-JUN-2022 13:56	10.0	BDP	1	co2
22206104406	CO2h.m	v8027.d	0.00 ml	14-JUN-2022 14:06	10.0	BDP	1	co2
22206111201	CO2h.m	v8028.d	0.00 ml	14-JUN-2022 14:15	10.0	BDP	1	co2
22206111202	CO2h.m	v8029.d	0.00 ml	14-JUN-2022 14:28	1.0	BDP	1	co2
22206111202	CO2h.m	v8030.d	0.00 ml	14-JUN-2022 14:44	5.0	BDP	1	co2
1400	CO2h.m	v8031.d	0.00 ml	14-JUN-2022 14:51	1.0	BDP	1	co2
22206111101	CO2h.m	v8032.d	0.00 ml	14-JUN-2022 14:57	10.0	BDP	1	co2
22206111101	CO2h.m	v8033.d	0.00 ml	14-JUN-2022 15:04	20.0	BDP	1	co2
22206111101	CO2h.m	v8034.d	0.00 ml	14-JUN-2022 15:10	50.0	BDP	1	co2
22206111102	CO2h.m	v8035.d	0.00 ml	14-JUN-2022 15:24	50.0	BDP	1	co2
22206111103	CO2h.m	v8036.d	0.00 ml	14-JUN-2022 15:30	50.0	BDP	1	co2
22206111104	CO2h.m	v8037.d	0.00 ml	14-JUN-2022 15:35	50.0	BDP	1	co2

LABORATORY CHRONICLE: GCV DEPARTMENT

Date: 06/14/2022
Instrument: gcv8b.i
Method File: /var/chem/gcv8b.i/2220614.b/CO2h.m
Batch: /var/chem/gcv8b.i/2220614.b
Column-Detector: GS-Q-30

Sample ID	Method	DataFile	Wgt/Vol	Injection Time	Dil	Anal	ALS	Comments
22206111105	CO2h.m	v8038.d	0.00 ml	14-JUN-2022 15:41	50.0	BDP	1	co2
22206111106	CO2h.m	v8039.d	0.00 ml	14-JUN-2022 15:52	50.0	BDP	1	co2
1400	CO2h.m	v8040.d	0.00 ml	14-JUN-2022 15:59	1.0	BDP	1	co2

Client ID: ALS Houston - ALS Environmental - Houston, TX
SDG: 222061111
PM: RWe

Subcontract Chain of Custody

SAMPLING STATE: Texas **COC ID:** 18920

SUBCONTRACT TO:

Pace Analytical
7979 Innovation Park Drive
Baton Rouge, LA 70820

Phone: +1 225 769 4900

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	Dane J. Wacasey
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	Dane.Wacasey@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS22060453
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE	
	ANALYSIS REQUESTED			DUE DATE	
1.	**HS22060453-01**	**35AWW19_060822**	**Groundwater**	**08 Jun 2022 07:15**	1
	SUB_CO2			23 Jun 2022	
2.	**HS22060453-02**	**35AWW23_060822**	**Groundwater**	**08 Jun 2022 08:05**	2
	SUB_CO2			23 Jun 2022	
3.	**HS22060453-03**	**35AWW06_060822**	**Groundwater**	**08 Jun 2022 09:00**	3
	SUB_CO2			23 Jun 2022	
4.	**HS22060453-04**	**LHSMW07_060822**	**Groundwater**	**08 Jun 2022 09:50**	4
	SUB_CO2			23 Jun 2022	
5.	**HS22060453-05**	**35AWW20_060822**	**Groundwater**	**08 Jun 2022 10:45**	5
	SUB_CO2			23 Jun 2022	
6.	**HS22060453-06**	**35AWW11_060822**	**Groundwater**	**08 Jun 2022 11:40**	6
	SUB_CO2			23 Jun 2022	

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Pace Gulf Coast Report#: 222061111

Subcontract Chain of Custody

SAMPLING STATE: **Texas**

COC ID: **18920**

Relinquished By: _____ Date/Time: 6.9.22 1800

Received By: _____ Date/Time: 6-10-22 0828

Cooler ID(s): _____ Temperature(s): _____

3.9 E42

Client ID: ALS Houston - ALS Environmental - Houston, TX

SDG: 222061111

PM: RWe

Pace Analytical®

SAMPLE RECEIVING CHECKLIST

222061111

SAMPLE DELIVERY GROUP 222061111	
Client **PM** RWe ALS Houston - ALS Environmental - Houston, TX	**Transport Method** CUSTOMER
Profile Number 294458	**Received By** Perkins, Brennan
Line Item(s) 1 - CO2	**Receive Date(s)** 06/10/22

CHECKLIST	YES	NO
Samples received with proper thermal preservation?	☑	☐
Radioactivity is <1600 cpm? If no, record cpm value in notes section.	☑	☐
COC relinquished and complete (including sampleIDs, collect times, and sampler)?	☑	☐
All containers received in good condition and within hold time?	☑	☐
All sample labels and containers received match the chain of custody?	☑	☐
Preservative added to any containers?	☐	☑
If received, was headspace for VOC water containers < 6mm?	☑	☐
Samples collected in containers provided by Pace Gulf Coast?	☑	☐

COOLERS

Airbill	Thermometer ID: E42	Temp °C
		3.9

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

Revision 1.6

10515 Research Drive
Knoxville, TN 37932
Phone: (865) 573-8188
Fax: (865) 573-8133

Client: Shannon Tyrell-Swadis
ALS Laboratory Group
10450 Stancliff Rd
Suite 210
Houston, TX 77040

Phone:

Fax:

Identifier: 040TF **Date Rec:** 06/10/2022 **Report Date:** 06/16/2022

Client Project #: NWO1312.0150 **Client Project Name:** LHAAP / Site58

Purchase Order #: HS18030472

Test results provided for: CENSUS

Reviewed By:



NOTICE: This report is intended only for the addressee shown above and may contain confidential or privileged information. If the recipient of this material is not the intended recipient or if you have received this in error, please notify Microbial Insights, Inc. immediately. The data and other information in this report represent only the sample(s) analyzed and are rendered upon condition that it is not to be reproduced without approval from Microbial Insights, Inc. Thank you for your cooperation.

Results relate only to the items tested and the sample(s) as received by the laboratory.

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **ALS Laboratory Group**
Project: LHAAP / Site58

MI Project Number: **040TF**
Date Received: 06/10/2022

Sample Information

Client Sample ID:		**35AWW19_060822**	**35AWW23_060822**	**35AWW06_060822**	**LHSMW07_060822**	**35AWW20_060822**
Sample Date:		06/08/2022	06/08/2022	06/08/2022	06/08/2022	06/08/2022
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		BB/CS	BB/CS	BB/CS	BB/CS	BB/CS
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**1.38E+02**	**1.58E+02**	**7.20E+00**	**4.68E+03**	**7.04E+04**
tceA Reductase	TCE	**5.12E+01**	**4.16E+01**	**3.00E-01 (J)**	**8.00E-01**	**1.00E+00**
BAV1 Vinyl Chloride Reductase	BVC	**7.13E+01**	**2.80E+00**	**4.00E-01 (J)**	**4.00E-01 (J)**	**6.74E+04**
Vinyl Chloride Reductase	VCR	**1.34E+01**	**6.39E+01**	<7.00E-01	**6.23E+02**	**1.80E+00**
Dehalobacter spp.	*DHBt*	**2.96E+03**	**1.29E+04**	**1.07E+03**	**2.85E+03**	**1.84E+04**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **ALS Laboratory Group**
Project: LHAAP / Site58

MI Project Number: **040TF**
Date Received: 06/10/2022

Sample Information

Client Sample ID:	**35AWW11_060822**
Sample Date:	06/08/2022
Units:	cells/mL
Analyst/Reviewer:	BB/CS

Dechlorinating Bacteria

Dehalococcoides	*DHC*	**1.75E+03**
tceA Reductase	TCE	**3.00E-01 (J)**
BAV1 Vinyl Chloride Reductase	BVC	**1.90E+00**
Vinyl Chloride Reductase	VCR	**1.41E+02**
Dehalobacter spp.	*DHBt*	**1.37E+05**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

Quality Assurance/Quality Control Data

Samples Received **6/10/2022**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	06/10/2022	06/16/2022	0 °C	110%	non-detect	non-detect
BVC	06/10/2022	06/16/2022	0 °C	101%	non-detect	non-detect
DHBt	06/10/2022	06/16/2022	0 °C	105%	non-detect	non-detect
TCE	06/10/2022	06/16/2022	0 °C	106%	non-detect	non-detect
VCR	06/10/2022	06/16/2022	0 °C	94%	non-detect	non-detect

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

June 24, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22060604**

Laboratory Results for: **LHAAP-58**

Dear Marcia Olive,

ALS Environmental received 8 sample(s) on Jun 10, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,



Generated By: DAYNA.FISHER
Dane J. Wacasey

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS22060604

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS22060604-01	35AWW17_060922	Water		09-Jun-2022 07:30	10-Jun-2022 09:10	☐
HS22060604-02	35AWW18_060922	Water		09-Jun-2022 08:15	10-Jun-2022 09:10	☐
HS22060604-03	35AWW05_060922	Water		09-Jun-2022 09:00	10-Jun-2022 09:10	☐
HS22060604-04	35AWW16_060922	Water		09-Jun-2022 09:45	10-Jun-2022 09:10	☐
HS22060604-05	35AWW15_060922	Water		09-Jun-2022 10:30	10-Jun-2022 09:10	☐
HS22060604-06	LHSMW06_060922	Water		09-Jun-2022 11:15	10-Jun-2022 09:10	☐
HS22060604-07	35AWW21_060922	Water		09-Jun-2022 12:00	10-Jun-2022 09:10	☐
HS22060604-08	Trip Blank	Water	CG-041822-98	09-Jun-2022 00:00	10-Jun-2022 09:10	☐

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS22060604

CASE NARRATIVE

GCMS Volatiles by Method SW8260

Batch ID: R410539

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020A

Batch ID: 180277

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW17_060922
Collection Date: 09-Jun-2022 07:30

ANALYTICAL REPORT
WorkOrder:HS22060604
Lab ID:HS22060604-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:30
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 16:30
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:30
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:30
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 16:30
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 16:30
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 16:30
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Jun-2022 16:30
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:30
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 16:30
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:30
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 16:30
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 16:30
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 16:30
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:30
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Jun-2022 16:30
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Jun-2022 16:30
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 16:30
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Jun-2022 16:30
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Jun-2022 16:30
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:30
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 16:30
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:30
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:30
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 16:30
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 16:30
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Jun-2022 16:30
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 16:30
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW17_060922
Collection Date: 09-Jun-2022 07:30

ANALYTICAL REPORT
WorkOrder:HS22060604
Lab ID:HS22060604-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:30
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:30
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:30
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:30
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Jun-2022 16:30
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Jun-2022 16:30
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Jun-2022 16:30
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 16:30
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:30
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:30
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:30
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:30
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:30
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:30
Surr: 1,2-Dichloroethane-d4	*91.9*			**0**	*81-118*	*%REC*	*1*	*13-Jun-2022 16:30*
Surr: 4-Bromofluorobenzene	*94.8*			**0**	*85-114*	*%REC*	*1*	*13-Jun-2022 16:30*
Surr: Dibromofluoromethane	*93.4*			**0**	*80-119*	*%REC*	*1*	*13-Jun-2022 16:30*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*13-Jun-2022 16:30*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW18_060922
Collection Date: 09-Jun-2022 08:15

ANALYTICAL REPORT
WorkOrder:HS22060604
Lab ID:HS22060604-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:51
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 16:51
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
1,1-Dichloroethane	**3.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Jun-2022 16:51
1,1-Dichloroethene	**15**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Jun-2022 16:51
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 16:51
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 16:51
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 16:51
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Jun-2022 16:51
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:51
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 16:51
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:51
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 16:51
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 16:51
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 16:51
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:51
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Jun-2022 16:51
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Jun-2022 16:51
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 16:51
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Jun-2022 16:51
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Jun-2022 16:51
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:51
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 16:51
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:51
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:51
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 16:51
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 16:51
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Jun-2022 16:51
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 16:51
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW18_060922
Collection Date: 09-Jun-2022 08:15

ANALYTICAL REPORT
WorkOrder:HS22060604
Lab ID:HS22060604-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:51
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:51
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:51
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:51
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Jun-2022 16:51
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Jun-2022 16:51
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Jun-2022 16:51
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 16:51
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:51
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:51
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:51
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:51
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 16:51
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 16:51
Surr: 1,2-Dichloroethane-d4	*92.8*			**0**	*81-118*	*%REC*	*1*	*13-Jun-2022 16:51*
Surr: 4-Bromofluorobenzene	*94.5*			**0**	*85-114*	*%REC*	*1*	*13-Jun-2022 16:51*
Surr: Dibromofluoromethane	*94.9*			**0**	*80-119*	*%REC*	*1*	*13-Jun-2022 16:51*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*13-Jun-2022 16:51*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW05_060922
Collection Date: 09-Jun-2022 09:00

ANALYTICAL REPORT
WorkOrder:HS22060604
Lab ID:HS22060604-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:41
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 13:41
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:41
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:41
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 13:41
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 13:41
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 13:41
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Jun-2022 13:41
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:41
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 13:41
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:41
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 13:41
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 13:41
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 13:41
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:41
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Jun-2022 13:41
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Jun-2022 13:41
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 13:41
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Jun-2022 13:41
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Jun-2022 13:41
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:41
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 13:41
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:41
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:41
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 13:41
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 13:41
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Jun-2022 13:41
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 13:41
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW05_060922
Collection Date: 09-Jun-2022 09:00

ANALYTICAL REPORT
WorkOrder:HS22060604
Lab ID:HS22060604-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:41
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:41
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:41
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:41
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Jun-2022 13:41
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Jun-2022 13:41
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Jun-2022 13:41
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 13:41
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:41
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:41
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:41
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:41
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:41
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:41
Surr: 1,2-Dichloroethane-d4	*90.5*			**0**	*81-118*	*%REC*	*1*	*13-Jun-2022 13:41*
Surr: 4-Bromofluorobenzene	*92.2*			**0**	*85-114*	*%REC*	*1*	*13-Jun-2022 13:41*
Surr: Dibromofluoromethane	*92.8*			**0**	*80-119*	*%REC*	*1*	*13-Jun-2022 13:41*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*13-Jun-2022 13:41*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW16_060922
Collection Date: 09-Jun-2022 09:45

ANALYTICAL REPORT
WorkOrder:HS22060604
Lab ID:HS22060604-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 14:02
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 14:02
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 14:02
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 14:02
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 14:02
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 14:02
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 14:02
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Jun-2022 14:02
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 14:02
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 14:02
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 14:02
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 14:02
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 14:02
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 14:02
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 14:02
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Jun-2022 14:02
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Jun-2022 14:02
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 14:02
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Jun-2022 14:02
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Jun-2022 14:02
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 14:02
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 14:02
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 14:02
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 14:02
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 14:02
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 14:02
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Jun-2022 14:02
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 14:02
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 14:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW16_060922
Collection Date: 09-Jun-2022 09:45

ANALYTICAL REPORT
WorkOrder:HS22060604
Lab ID:HS22060604-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 14:02
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 14:02
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 14:02
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 14:02
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Jun-2022 14:02
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Jun-2022 14:02
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Jun-2022 14:02
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 14:02
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 14:02
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 14:02
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 14:02
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 14:02
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 14:02
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 14:02
Surr: 1,2-Dichloroethane-d4	*92.1*			**0**	*81-118*	*%REC*	*1*	*13-Jun-2022 14:02*
Surr: 4-Bromofluorobenzene	*93.2*			**0**	*85-114*	*%REC*	*1*	*13-Jun-2022 14:02*
Surr: Dibromofluoromethane	*94.3*			**0**	*80-119*	*%REC*	*1*	*13-Jun-2022 14:02*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*13-Jun-2022 14:02*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW15_060922
Collection Date: 09-Jun-2022 10:30

ANALYTICAL REPORT
WorkOrder:HS22060604
Lab ID:HS22060604-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:12
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 17:12
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:12
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:12
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:12
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 17:12
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 17:12
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Jun-2022 17:12
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:12
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 17:12
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:12
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 17:12
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:12
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:12
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:12
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Jun-2022 17:12
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Jun-2022 17:12
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:12
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Jun-2022 17:12
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Jun-2022 17:12
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:12
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:12
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:12
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:12
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:12
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:12
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Jun-2022 17:12
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 17:12
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW15_060922
Collection Date: 09-Jun-2022 10:30

ANALYTICAL REPORT
WorkOrder:HS22060604
Lab ID:HS22060604-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:12
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:12
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:12
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:12
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Jun-2022 17:12
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Jun-2022 17:12
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Jun-2022 17:12
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:12
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:12
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:12
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:12
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:12
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:12
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:12
Surr: 1,2-Dichloroethane-d4	*91.7*			**0**	*81-118*	*%REC*	*1*	*13-Jun-2022 17:12*
Surr: 4-Bromofluorobenzene	*92.8*			**0**	*85-114*	*%REC*	*1*	*13-Jun-2022 17:12*
Surr: Dibromofluoromethane	*93.1*			**0**	*80-119*	*%REC*	*1*	*13-Jun-2022 17:12*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*13-Jun-2022 17:12*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: LHSMW06_060922
Collection Date: 09-Jun-2022 11:15

ANALYTICAL REPORT
WorkOrder:HS22060604
Lab ID:HS22060604-06
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:33
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:33
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 17:33
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:33
1,1-Dichloroethane	**5.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Jun-2022 17:33
1,1-Dichloroethene	**9.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Jun-2022 17:33
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:33
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:33
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 17:33
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 17:33
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:33
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Jun-2022 17:33
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:33
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 17:33
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:33
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 17:33
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:33
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:33
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:33
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:33
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:33
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Jun-2022 17:33
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:33
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Jun-2022 17:33
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:33
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:33
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Jun-2022 17:33
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Jun-2022 17:33
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:33
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:33
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:33
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:33
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:33
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:33
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Jun-2022 17:33
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 17:33
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:33
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:33
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:33

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: LHSMW06_060922
Collection Date: 09-Jun-2022 11:15

ANALYTICAL REPORT
WorkOrder:HS22060604
Lab ID:HS22060604-06
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:33
cis-1,2-Dichloroethene	**81**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Jun-2022 17:33
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:33
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:33
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:33
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:33
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:33
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Jun-2022 17:33
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:33
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Jun-2022 17:33
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Jun-2022 17:33
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:33
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:33
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:33
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:33
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:33
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:33
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:33
Tetrachloroethene	**1.9**		**0.30**	**1.0**	**1.0**	**ug/L**	1	13-Jun-2022 17:33
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:33
trans-1,2-Dichloroethene	**1.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Jun-2022 17:33
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:33
Trichloroethene	**13**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Jun-2022 17:33
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:33
Vinyl chloride	**2.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Jun-2022 17:33
Surr: 1,2-Dichloroethane-d4	*90.5*			**0**	*81-118*	*%REC*	*1*	*13-Jun-2022 17:33*
Surr: 4-Bromofluorobenzene	*93.2*			**0**	*85-114*	*%REC*	*1*	*13-Jun-2022 17:33*
Surr: Dibromofluoromethane	*92.8*			**0**	*80-119*	*%REC*	*1*	*13-Jun-2022 17:33*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*13-Jun-2022 17:33*
METALS BY ICPMS BY SW6020A		**Method:SW6020A**				Prep:SW3010A / 22-Jun-2022		Analyst: JHD
Arsenic	**0.000446**	J	**0.000400**	**0.00125**	**0.00500**	**mg/L**	1	22-Jun-2022 21:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW21_060922
Collection Date: 09-Jun-2022 12:00

ANALYTICAL REPORT
WorkOrder:HS22060604
Lab ID:HS22060604-07
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:54
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 17:54
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:54
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:54
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:54
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 17:54
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 17:54
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Jun-2022 17:54
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:54
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 17:54
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:54
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 17:54
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:54
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:54
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:54
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Jun-2022 17:54
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Jun-2022 17:54
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:54
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Jun-2022 17:54
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Jun-2022 17:54
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:54
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:54
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:54
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:54
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:54
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:54
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Jun-2022 17:54
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 17:54
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW21_060922
Collection Date: 09-Jun-2022 12:00

ANALYTICAL REPORT
WorkOrder:HS22060604
Lab ID:HS22060604-07
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:54
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:54
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:54
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:54
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Jun-2022 17:54
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Jun-2022 17:54
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Jun-2022 17:54
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 17:54
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:54
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:54
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:54
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:54
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 17:54
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 17:54
Surr: 1,2-Dichloroethane-d4	*90.4*			**0**	*81-118*	*%REC*	*1*	*13-Jun-2022 17:54*
Surr: 4-Bromofluorobenzene	*95.3*			**0**	*85-114*	*%REC*	*1*	*13-Jun-2022 17:54*
Surr: Dibromofluoromethane	*93.3*			**0**	*80-119*	*%REC*	*1*	*13-Jun-2022 17:54*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*13-Jun-2022 17:54*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: Trip Blank
Collection Date: 09-Jun-2022 00:00

ANALYTICAL REPORT
WorkOrder:HS22060604
Lab ID:HS22060604-08
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:20
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 13:20
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:20
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:20
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 13:20
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 13:20
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 13:20
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Jun-2022 13:20
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:20
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 13:20
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:20
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 13:20
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 13:20
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 13:20
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:20
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Jun-2022 13:20
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Jun-2022 13:20
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 13:20
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Jun-2022 13:20
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Jun-2022 13:20
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:20
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 13:20
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:20
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:20
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 13:20
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 13:20
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Jun-2022 13:20
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Jun-2022 13:20
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: Trip Blank
Collection Date: 09-Jun-2022 00:00

ANALYTICAL REPORT
WorkOrder:HS22060604
Lab ID:HS22060604-08
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:20
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:20
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:20
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:20
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Jun-2022 13:20
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Jun-2022 13:20
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Jun-2022 13:20
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Jun-2022 13:20
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:20
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:20
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:20
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:20
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Jun-2022 13:20
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Jun-2022 13:20
Surr: 1,2-Dichloroethane-d4	*90.6*			**0**	*81-118*	*%REC*	*1*	*13-Jun-2022 13:20*
Surr: 4-Bromofluorobenzene	*93.6*			**0**	*85-114*	*%REC*	*1*	*13-Jun-2022 13:20*
Surr: Dibromofluoromethane	*93.9*			**0**	*80-119*	*%REC*	*1*	*13-Jun-2022 13:20*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*13-Jun-2022 13:20*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Jun-22

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060604

Batch ID: 180277 **Start Date:** 22 Jun 2022 09:00 **End Date:** 22 Jun 2022 13:00
Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS22060604-06		10 (mL)	10 (mL)	1	120 plastic HNO3

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060604

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 180277 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Water	
HS22060604-06	LHSMW06_060922	09 Jun 2022 11:15		22 Jun 2022 09:00	22 Jun 2022 21:26	1
Batch ID: R410539 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS22060604-01	35AWW17_060922	09 Jun 2022 07:30			13 Jun 2022 16:30	1
HS22060604-02	35AWW18_060922	09 Jun 2022 08:15			13 Jun 2022 16:51	1
HS22060604-03	35AWW05_060922	09 Jun 2022 09:00			13 Jun 2022 13:41	1
HS22060604-04	35AWW16_060922	09 Jun 2022 09:45			13 Jun 2022 14:02	1
HS22060604-05	35AWW15_060922	09 Jun 2022 10:30			13 Jun 2022 17:12	1
HS22060604-06	LHSMW06_060922	09 Jun 2022 11:15			13 Jun 2022 17:33	1
HS22060604-07	35AWW21_060922	09 Jun 2022 12:00			13 Jun 2022 17:54	1
HS22060604-08	Trip Blank	09 Jun 2022 00:00			13 Jun 2022 13:20	1

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060604

QC BATCH REPORT

Batch ID: 180277 (0) **Instrument: ICPMS07** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-180277** Units: **mg/L** Analysis Date: **22-Jun-2022 20:16**
Client ID: Run ID: **ICPMS07_411293** SeqNo: **6708359** PrepDate: **22-Jun-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.00125	0.00500								U

LCS Sample ID: **LCS-180277** Units: **mg/L** Analysis Date: **22-Jun-2022 20:18**
Client ID: Run ID: **ICPMS07_411293** SeqNo: **6708360** PrepDate: **22-Jun-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.04829	0.00500	0.05	0	96.6	84 - 116				

MS Sample ID: **HS22060605-01MS** Units: **mg/L** Analysis Date: **22-Jun-2022 21:20**
Client ID: Run ID: **ICPMS07_411293** SeqNo: **6708385** PrepDate: **22-Jun-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.1433	0.00500	0.05	0.09258	101	84 - 116				

MSD Sample ID: **HS22060605-01MSD** Units: **mg/L** Analysis Date: **22-Jun-2022 21:22**
Client ID: Run ID: **ICPMS07_411293** SeqNo: **6708386** PrepDate: **22-Jun-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.1353	0.00500	0.05	0.09258	85.4	84 - 116	0.1433	5.72	20	

PDS Sample ID: **HS22060605-01PDS** Units: **mg/L** Analysis Date: **22-Jun-2022 20:28**
Client ID: Run ID: **ICPMS07_411293** SeqNo: **6708362** PrepDate: **22-Jun-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.1863	0.00500	0.1	0.09258	93.7	80 - 120				

SD Sample ID: **HS22060605-01SD** Units: **mg/L** Analysis Date: **22-Jun-2022 20:22**
Client ID: Run ID: **ICPMS07_411293** SeqNo: **6708361** PrepDate: **22-Jun-2022** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	0.09225	0.0250					0.09258	0.356	10	

The following samples were analyzed in this batch: HS22060604-06

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060604

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-220613** Units: **ug/L** Analysis Date: **13-Jun-2022 12:38**
Client ID: Run ID: **VOA6_410539** SeqNo: **6690144** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1.0	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	1.0	1.0								U
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	1.0	1.0								U
1,2,3-Trichlorobenzene	1.0	1.0								U
1,2,3-Trichloropropane	1.0	1.0								U
1,2,4-Trichlorobenzene	1.0	1.0								U
1,2,4-Trimethylbenzene	1.0	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	1.0	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	1.0	1.0								U
1,3,5-Trimethylbenzene	1.0	1.0								U
1,3-Dichlorobenzene	1.0	1.0								U
1,3-Dichloropropane	1.0	1.0								U
1,4-Dichlorobenzene	1.0	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	1.0	1.0								U
2-Hexanone	2.0	2.0								U
4-Chlorotoluene	1.0	1.0								U
4-Isopropyltoluene	1.0	1.0								U
4-Methyl-2-pentanone	2.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	1.0	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	1.0	1.0								U
Bromomethane	1.0	1.0								U

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060604

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-220613** Units: **ug/L** Analysis Date: **13-Jun-2022 12:38**
Client ID: Run ID: **VOA6_410539** SeqNo: **6690144** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	2.0	2.0								U
Carbon tetrachloride	1.0	1.0								U
Chlorobenzene	1.0	1.0								U
Chloroethane	1.0	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	1.0	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	1.0	1.0								U
Ethylbenzene	1.0	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	1.0	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	2.0	2.0								U
Naphthalene	1.0	1.0								U
n-Butylbenzene	1.0	1.0								U
n-Propylbenzene	1.0	1.0								U
o-Xylene	1.0	1.0								U
sec-Butylbenzene	1.0	1.0								U
Styrene	1.0	1.0								U
tert-Butylbenzene	1.0	1.0								U
Tetrachloroethene	1.0	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	1.0	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*45.02*	*1.0*	*50*	*0*	*90.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*46.8*	*1.0*	*50*	*0*	*93.6*	*85 - 114*				
Surr: Dibromofluoromethane	*46.31*	*1.0*	*50*	*0*	*92.6*	*80 - 119*				
Surr: Toluene-d8	*50.38*	*1.0*	*50*	*0*	*101*	*89 - 112*				

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060604

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-220613** Units: **ug/L** Analysis Date: **13-Jun-2022 11:56**
Client ID: Run ID: **VOA6_410539** SeqNo: **6690143** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.28	1.0	20	0	101	78 - 124				
1,1,1-Trichloroethane	19.37	1.0	20	0	96.8	74 - 131				
1,1,2,2-Tetrachloroethane	19.68	1.0	20	0	98.4	71 - 121				
1,1,2-Trichloroethane	19.57	1.0	20	0	97.9	80 - 119				
1,1-Dichloroethane	19.91	1.0	20	0	99.5	77 - 125				
1,1-Dichloroethene	18.1	1.0	20	0	90.5	71 - 131				
1,1-Dichloropropene	20.53	1.0	20	0	103	78 - 125				
1,2,3-Trichlorobenzene	19.8	1.0	20	0	99.0	69 - 129				
1,2,3-Trichloropropane	19.4	1.0	20	0	97.0	73 - 122				
1,2,4-Trichlorobenzene	20.83	1.0	20	0	104	69 - 130				
1,2,4-Trimethylbenzene	20.88	1.0	20	0	104	76 - 124				
1,2-Dibromo-3-chloropropane	17.47	1.0	20	0	87.4	62 - 128				
1,2-Dibromoethane	19.86	1.0	20	0	99.3	77 - 121				
1,2-Dichlorobenzene	20.52	1.0	20	0	103	80 - 119				
1,2-Dichloroethane	20.45	1.0	20	0	102	73 - 128				
1,2-Dichloropropane	20.61	1.0	20	0	103	78 - 122				
1,3,5-Trimethylbenzene	20.65	1.0	20	0	103	75 - 124				
1,3-Dichlorobenzene	20.9	1.0	20	0	105	80 - 119				
1,3-Dichloropropane	19.77	1.0	20	0	98.8	80 - 119				
1,4-Dichlorobenzene	20.34	1.0	20	0	102	79 - 118				
2,2-Dichloropropane	20.29	1.0	20	0	101	60 - 139				
2-Butanone	36.91	2.0	40	0	92.3	56 - 143				
2-Chlorotoluene	20.36	1.0	20	0	102	79 - 122				
2-Hexanone	38.49	2.0	40	0	96.2	57 - 139				
4-Chlorotoluene	20.84	1.0	20	0	104	78 - 122				
4-Isopropyltoluene	21.31	1.0	20	0	107	77 - 127				
4-Methyl-2-pentanone	37.96	2.0	40	0	94.9	67 - 130				
Acetone	37.36	2.0	40	0	93.4	39 - 160				
Benzene	20.62	1.0	20	0	103	79 - 120				
Bromobenzene	20.77	1.0	20	0	104	80 - 120				
Bromochloromethane	19.71	1.0	20	0	98.6	78 - 123				
Bromodichloromethane	19.62	1.0	20	0	98.1	79 - 125				
Bromoform	19.64	1.0	20	0	98.2	66 - 130				
Bromomethane	17.04	1.0	20	0	85.2	53 - 141				

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060604

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-220613** Units: **ug/L** Analysis Date: **13-Jun-2022 11:56**
Client ID: Run ID: **VOA6_410539** SeqNo: **6690143** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	39.13	2.0	40	0	97.8	64 - 133				
Carbon tetrachloride	19.52	1.0	20	0	97.6	72 - 136				
Chlorobenzene	20.49	1.0	20	0	102	82 - 118				
Chloroethane	18.22	1.0	20	0	91.1	60 - 138				
Chloroform	19.24	1.0	20	0	96.2	79 - 124				
Chloromethane	19.86	1.0	20	0	99.3	50 - 139				
cis-1,2-Dichloroethene	20.32	1.0	20	0	102	78 - 123				
cis-1,3-Dichloropropene	20.65	1.0	20	0	103	75 - 124				
Dibromochloromethane	19.89	1.0	20	0	99.4	74 - 126				
Dibromomethane	19.91	1.0	20	0	99.6	79 - 123				
Dichlorodifluoromethane	18.84	1.0	20	0	94.2	32 - 152				
Ethylbenzene	20.66	1.0	20	0	103	79 - 121				
Hexachlorobutadiene	20.91	1.0	20	0	105	66 - 134				
Isopropylbenzene	19.78	1.0	20	0	98.9	72 - 131				
m,p-Xylene	41.1	2.0	40	0	103	80 - 121				
Methylene chloride	18.62	2.0	20	0	93.1	74 - 124				
Naphthalene	19.55	1.0	20	0	97.8	61 - 128				
n-Butylbenzene	20.85	1.0	20	0	104	75 - 128				
n-Propylbenzene	20.86	1.0	20	0	104	76 - 126				
o-Xylene	20.63	1.0	20	0	103	78 - 122				
sec-Butylbenzene	20.73	1.0	20	0	104	77 - 126				
Styrene	20.5	1.0	20	0	102	78 - 123				
tert-Butylbenzene	20.89	1.0	20	0	104	78 - 124				
Tetrachloroethene	20.46	1.0	20	0	102	74 - 129				
Toluene	20.56	1.0	20	0	103	80 - 121				
trans-1,2-Dichloroethene	20.11	1.0	20	0	101	75 - 124				
trans-1,3-Dichloropropene	20.07	1.0	20	0	100	73 - 127				
Trichloroethene	20.61	1.0	20	0	103	79 - 123				
Trichlorofluoromethane	17.77	1.0	20	0	88.9	65 - 141				
Vinyl chloride	18.1	1.0	20	0	90.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*47.34*	*1.0*	*50*	*0*	*94.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.62*	*1.0*	*50*	*0*	*99.2*	*85 - 114*				
Surr: Dibromofluoromethane	*48.84*	*1.0*	*50*	*0*	*97.7*	*80 - 119*				
Surr: Toluene-d8	*48.41*	*1.0*	*50*	*0*	*96.8*	*89 - 112*				

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060604

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS22060604-04MS** Units: **ug/L** Analysis Date: **13-Jun-2022 15:27**
Client ID: **35AWW16_060922** Run ID: **VOA6_410539** SeqNo: **6690152** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.81	1.0	20	0	104	78 - 124				
1,1,1-Trichloroethane	19.04	1.0	20	0	95.2	74 - 131				
1,1,2,2-Tetrachloroethane	20.98	1.0	20	0	105	71 - 121				
1,1,2-Trichloroethane	20.03	1.0	20	0	100	80 - 119				
1,1-Dichloroethane	19.68	1.0	20	0	98.4	77 - 125				
1,1-Dichloroethene	17.72	1.0	20	0	88.6	71 - 131				
1,1-Dichloropropene	20.14	1.0	20	0	101	78 - 125				
1,2,3-Trichlorobenzene	21.56	1.0	20	0	108	69 - 129				
1,2,3-Trichloropropane	20.6	1.0	20	0	103	73 - 122				
1,2,4-Trichlorobenzene	21.14	1.0	20	0	106	69 - 130				
1,2,4-Trimethylbenzene	21.8	1.0	20	0	109	76 - 124				
1,2-Dibromo-3-chloropropane	18.45	1.0	20	0	92.3	62 - 128				
1,2-Dibromoethane	20.14	1.0	20	0	101	77 - 121				
1,2-Dichlorobenzene	21.19	1.0	20	0	106	80 - 119				
1,2-Dichloroethane	19.65	1.0	20	0	98.2	73 - 128				
1,2-Dichloropropane	20.18	1.0	20	0	101	78 - 122				
1,3,5-Trimethylbenzene	21.91	1.0	20	0	110	75 - 124				
1,3-Dichlorobenzene	21.57	1.0	20	0	108	80 - 119				
1,3-Dichloropropane	20.31	1.0	20	0	102	80 - 119				
1,4-Dichlorobenzene	21.4	1.0	20	0	107	79 - 118				
2,2-Dichloropropane	19.52	1.0	20	0	97.6	60 - 139				
2-Butanone	33.35	2.0	40	0	83.4	56 - 143				
2-Chlorotoluene	21.26	1.0	20	0	106	79 - 122				
2-Hexanone	40.15	2.0	40	0	100	57 - 139				
4-Chlorotoluene	21.88	1.0	20	0	109	78 - 122				
4-Isopropyltoluene	22.74	1.0	20	0	114	77 - 127				
4-Methyl-2-pentanone	40.38	2.0	40	0	101	67 - 130				
Acetone	29.19	2.0	40	0	73.0	39 - 160				
Benzene	20.19	1.0	20	0	101	79 - 120				
Bromobenzene	21.75	1.0	20	0	109	80 - 120				
Bromochloromethane	19.3	1.0	20	0	96.5	78 - 123				
Bromodichloromethane	19.17	1.0	20	0	95.9	79 - 125				
Bromoform	19.83	1.0	20	0	99.1	66 - 130				
Bromomethane	16.21	1.0	20	0	81.1	53 - 141				

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060604

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS22060604-04MS** Units: **ug/L** Analysis Date: **13-Jun-2022 15:27**
Client ID: **35AWW16_060922** Run ID: **VOA6_410539** SeqNo: **6690152** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	37.73	2.0	40	0	94.3	64 - 133				
Carbon tetrachloride	19.81	1.0	20	0	99.0	72 - 136				
Chlorobenzene	20.97	1.0	20	0	105	82 - 118				
Chloroethane	18.35	1.0	20	0	91.8	60 - 138				
Chloroform	18.73	1.0	20	0	93.6	79 - 124				
Chloromethane	16.18	1.0	20	0	80.9	50 - 139				
cis-1,2-Dichloroethene	19.89	1.0	20	0	99.5	78 - 123				
cis-1,3-Dichloropropene	19.61	1.0	20	0	98.1	75 - 124				
Dibromochloromethane	20.21	1.0	20	0	101	74 - 126				
Dibromomethane	19.41	1.0	20	0	97.1	79 - 123				
Dichlorodifluoromethane	10.64	1.0	20	0	53.2	32 - 152				
Ethylbenzene	21.31	1.0	20	0	107	79 - 121				
Hexachlorobutadiene	21.27	1.0	20	0	106	66 - 134				
Isopropylbenzene	20.55	1.0	20	0	103	72 - 131				
m,p-Xylene	41.88	2.0	40	0	105	80 - 121				
Methylene chloride	17.48	2.0	20	0	87.4	74 - 124				
Naphthalene	20.02	1.0	20	0	100	61 - 128				
n-Butylbenzene	22.15	1.0	20	0	111	75 - 128				
n-Propylbenzene	22.34	1.0	20	0	112	76 - 126				
o-Xylene	21.05	1.0	20	0	105	78 - 122				
sec-Butylbenzene	22.23	1.0	20	0	111	77 - 126				
Styrene	20.92	1.0	20	0	105	78 - 123				
tert-Butylbenzene	22.56	1.0	20	0	113	78 - 124				
Tetrachloroethene	20.92	1.0	20	0	105	74 - 129				
Toluene	21.07	1.0	20	0	105	80 - 121				
trans-1,2-Dichloroethene	19.63	1.0	20	0	98.1	75 - 124				
trans-1,3-Dichloropropene	19.24	1.0	20	0	96.2	73 - 127				
Trichloroethene	20.44	1.0	20	0	102	79 - 123				
Trichlorofluoromethane	17.46	1.0	20	0	87.3	65 - 141				
Vinyl chloride	16.18	1.0	20	0	80.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*44.8*	*1.0*	*50*	*0*	*89.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.67*	*1.0*	*50*	*0*	*97.3*	*85 - 114*				
Surr: Dibromofluoromethane	*46.83*	*1.0*	*50*	*0*	*93.7*	*80 - 119*				
Surr: Toluene-d8	*50.2*	*1.0*	*50*	*0*	*100*	*89 - 112*				

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060604

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS22060604-03MS** Units: **ug/L** Analysis Date: **13-Jun-2022 14:44**
Client ID: **35AWW05_060922** Run ID: **VOA6_410539** SeqNo: **6690150** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.17	1.0	20	0	101	78 - 124				
1,1,1-Trichloroethane	19.21	1.0	20	0	96.0	74 - 131				
1,1,2,2-Tetrachloroethane	19.88	1.0	20	0	99.4	71 - 121				
1,1,2-Trichloroethane	19.5	1.0	20	0	97.5	80 - 119				
1,1-Dichloroethane	19.79	1.0	20	0	99.0	77 - 125				
1,1-Dichloroethene	18.47	1.0	20	0	92.3	71 - 131				
1,1-Dichloropropene	20.37	1.0	20	0	102	78 - 125				
1,2,3-Trichlorobenzene	15.73	1.0	20	0	78.6	69 - 129				
1,2,3-Trichloropropane	20.93	1.0	20	0	105	73 - 122				
1,2,4-Trichlorobenzene	18.15	1.0	20	0	90.7	69 - 130				
1,2,4-Trimethylbenzene	21.73	1.0	20	0	109	76 - 124				
1,2-Dibromo-3-chloropropane	15.62	1.0	20	0	78.1	62 - 128				
1,2-Dibromoethane	19.13	1.0	20	0	95.7	77 - 121				
1,2-Dichlorobenzene	20.99	1.0	20	0	105	80 - 119				
1,2-Dichloroethane	18.91	1.0	20	0	94.6	73 - 128				
1,2-Dichloropropane	19.97	1.0	20	0	99.8	78 - 122				
1,3,5-Trimethylbenzene	22.15	1.0	20	0	111	75 - 124				
1,3-Dichlorobenzene	21.17	1.0	20	0	106	80 - 119				
1,3-Dichloropropane	19.71	1.0	20	0	98.5	80 - 119				
1,4-Dichlorobenzene	21.33	1.0	20	0	107	79 - 118				
2,2-Dichloropropane	20.09	1.0	20	0	100	60 - 139				
2-Butanone	29.73	2.0	40	0	74.3	56 - 143				
2-Chlorotoluene	21.53	1.0	20	0	108	79 - 122				
2-Hexanone	35.89	2.0	40	0	89.7	57 - 139				
4-Chlorotoluene	21.74	1.0	20	0	109	78 - 122				
4-Isopropyltoluene	22.93	1.0	20	0	115	77 - 127				
4-Methyl-2-pentanone	36.85	2.0	40	0	92.1	67 - 130				
Acetone	25.27	2.0	40	0	63.2	39 - 160				
Benzene	20.2	1.0	20	0	101	79 - 120				
Bromobenzene	21.84	1.0	20	0	109	80 - 120				
Bromochloromethane	19.02	1.0	20	0	95.1	78 - 123				
Bromodichloromethane	18.86	1.0	20	0	94.3	79 - 125				
Bromoform	18.81	1.0	20	0	94.1	66 - 130				
Bromomethane	17.15	1.0	20	0	85.7	53 - 141				

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060604

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS22060604-03MS** Units: **ug/L** Analysis Date: **13-Jun-2022 14:44**
Client ID: **35AWW05_060922** Run ID: **VOA6_410539** SeqNo: **6690150** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	38.33	2.0	40	0	95.8	64 - 133				
Carbon tetrachloride	19.54	1.0	20	0	97.7	72 - 136				
Chlorobenzene	20.69	1.0	20	0	103	82 - 118				
Chloroethane	17.88	1.0	20	0	89.4	60 - 138				
Chloroform	18.84	1.0	20	0	94.2	79 - 124				
Chloromethane	16.53	1.0	20	0	82.7	50 - 139				
cis-1,2-Dichloroethene	19.73	1.0	20	0	98.7	78 - 123				
cis-1,3-Dichloropropene	19.37	1.0	20	0	96.8	75 - 124				
Dibromochloromethane	19.88	1.0	20	0	99.4	74 - 126				
Dibromomethane	19.04	1.0	20	0	95.2	79 - 123				
Dichlorodifluoromethane	11.32	1.0	20	0	56.6	32 - 152				
Ethylbenzene	21.33	1.0	20	0	107	79 - 121				
Hexachlorobutadiene	21.48	1.0	20	0	107	66 - 134				
Isopropylbenzene	20.58	1.0	20	0	103	72 - 131				
m,p-Xylene	42.27	2.0	40	0	106	80 - 121				
Methylene chloride	17.67	2.0	20	0	88.4	74 - 124				
Naphthalene	14.07	1.0	20	0	70.4	61 - 128				
n-Butylbenzene	22.42	1.0	20	0	112	75 - 128				
n-Propylbenzene	22.54	1.0	20	0	113	76 - 126				
o-Xylene	21.07	1.0	20	0	105	78 - 122				
sec-Butylbenzene	22.5	1.0	20	0	113	77 - 126				
Styrene	20.58	1.0	20	0	103	78 - 123				
tert-Butylbenzene	22.8	1.0	20	0	114	78 - 124				
Tetrachloroethene	21.56	1.0	20	0	108	74 - 129				
Toluene	21.11	1.0	20	0	106	80 - 121				
trans-1,2-Dichloroethene	19.77	1.0	20	0	98.8	75 - 124				
trans-1,3-Dichloropropene	18.9	1.0	20	0	94.5	73 - 127				
Trichloroethene	20.36	1.0	20	0	102	79 - 123				
Trichlorofluoromethane	18.12	1.0	20	0	90.6	65 - 141				
Vinyl chloride	16.64	1.0	20	0	83.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.04*	*1.0*	*50*	*0*	*92.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.54*	*1.0*	*50*	*0*	*97.1*	*85 - 114*				
Surr: Dibromofluoromethane	*47.1*	*1.0*	*50*	*0*	*94.2*	*80 - 119*				
Surr: Toluene-d8	*49.96*	*1.0*	*50*	*0*	*99.9*	*89 - 112*				

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060604

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22060604-04MSD** Units: **ug/L** Analysis Date: **13-Jun-2022 15:48**
Client ID: **35AWW16_060922** Run ID: **VOA6_410539** SeqNo: **6690153** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.92	1.0	20	0	99.6	78 - 124	20.81	4.38	20	
1,1,1-Trichloroethane	18.51	1.0	20	0	92.5	74 - 131	19.04	2.83	20	
1,1,2,2-Tetrachloroethane	20.89	1.0	20	0	104	71 - 121	20.98	0.442	20	
1,1,2-Trichloroethane	19.01	1.0	20	0	95.1	80 - 119	20.03	5.23	20	
1,1-Dichloroethane	19.2	1.0	20	0	96.0	77 - 125	19.68	2.44	20	
1,1-Dichloroethene	17.06	1.0	20	0	85.3	71 - 131	17.72	3.75	20	
1,1-Dichloropropene	18.93	1.0	20	0	94.7	78 - 125	20.14	6.16	20	
1,2,3-Trichlorobenzene	21.36	1.0	20	0	107	69 - 129	21.56	0.958	20	
1,2,3-Trichloropropane	19.23	1.0	20	0	96.2	73 - 122	20.6	6.86	20	
1,2,4-Trichlorobenzene	20.37	1.0	20	0	102	69 - 130	21.14	3.71	20	
1,2,4-Trimethylbenzene	21.37	1.0	20	0	107	76 - 124	21.8	2	20	
1,2-Dibromo-3-chloropropane	18.73	1.0	20	0	93.7	62 - 128	18.45	1.5	20	
1,2-Dibromoethane	19.46	1.0	20	0	97.3	77 - 121	20.14	3.41	20	
1,2-Dichlorobenzene	21.1	1.0	20	0	106	80 - 119	21.19	0.434	20	
1,2-Dichloroethane	19.18	1.0	20	0	95.9	73 - 128	19.65	2.41	20	
1,2-Dichloropropane	19.4	1.0	20	0	97.0	78 - 122	20.18	3.93	20	
1,3,5-Trimethylbenzene	21.36	1.0	20	0	107	75 - 124	21.91	2.55	20	
1,3-Dichlorobenzene	21.04	1.0	20	0	105	80 - 119	21.57	2.51	20	
1,3-Dichloropropane	19.4	1.0	20	0	97.0	80 - 119	20.31	4.57	20	
1,4-Dichlorobenzene	21.01	1.0	20	0	105	79 - 118	21.4	1.85	20	
2,2-Dichloropropane	18.71	1.0	20	0	93.6	60 - 139	19.52	4.24	20	
2-Butanone	31.94	2.0	40	0	79.9	56 - 143	33.35	4.3	20	
2-Chlorotoluene	20.85	1.0	20	0	104	79 - 122	21.26	1.94	20	
2-Hexanone	40.11	2.0	40	0	100	57 - 139	40.15	0.088	20	
4-Chlorotoluene	21.12	1.0	20	0	106	78 - 122	21.88	3.55	20	
4-Isopropyltoluene	21.84	1.0	20	0	109	77 - 127	22.74	4.07	20	
4-Methyl-2-pentanone	39.22	2.0	40	0	98.1	67 - 130	40.38	2.9	20	
Acetone	29.23	2.0	40	0	73.1	39 - 160	29.19	0.13	20	
Benzene	19.59	1.0	20	0	97.9	79 - 120	20.19	3.01	20	
Bromobenzene	21.58	1.0	20	0	108	80 - 120	21.75	0.758	20	
Bromochloromethane	18.92	1.0	20	0	94.6	78 - 123	19.3	2.01	20	
Bromodichloromethane	18.53	1.0	20	0	92.7	79 - 125	19.17	3.42	20	
Bromoform	19.05	1.0	20	0	95.2	66 - 130	19.83	4.01	20	
Bromomethane	15.19	1.0	20	0	75.9	53 - 141	16.21	6.55	20	

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060604

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22060604-04MSD** Units: **ug/L** Analysis Date: **13-Jun-2022 15:48**
Client ID: **35AWW16_060922** Run ID: **VOA6_410539** SeqNo: **6690153** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	36.16	2.0	40	0	90.4	64 - 133	37.73	4.27	20	
Carbon tetrachloride	18.74	1.0	20	0	93.7	72 - 136	19.81	5.52	20	
Chlorobenzene	19.89	1.0	20	0	99.5	82 - 118	20.97	5.27	20	
Chloroethane	17.79	1.0	20	0	88.9	60 - 138	18.35	3.13	20	
Chloroform	18.24	1.0	20	0	91.2	79 - 124	18.73	2.64	20	
Chloromethane	15.63	1.0	20	0	78.2	50 - 139	16.18	3.43	20	
cis-1,2-Dichloroethene	19.29	1.0	20	0	96.4	78 - 123	19.89	3.08	20	
cis-1,3-Dichloropropene	18.97	1.0	20	0	94.9	75 - 124	19.61	3.31	20	
Dibromochloromethane	19.43	1.0	20	0	97.2	74 - 126	20.21	3.92	20	
Dibromomethane	18.76	1.0	20	0	93.8	79 - 123	19.41	3.39	20	
Dichlorodifluoromethane	10.04	1.0	20	0	50.2	32 - 152	10.64	5.78	20	
Ethylbenzene	20.33	1.0	20	0	102	79 - 121	21.31	4.69	20	
Hexachlorobutadiene	20.63	1.0	20	0	103	66 - 134	21.27	3.06	20	
Isopropylbenzene	19.24	1.0	20	0	96.2	72 - 131	20.55	6.61	20	
m,p-Xylene	40.22	2.0	40	0	101	80 - 121	41.88	4.06	20	
Methylene chloride	17.01	2.0	20	0	85.1	74 - 124	17.48	2.73	20	
Naphthalene	21.06	1.0	20	0	105	61 - 128	20.02	5.04	20	
n-Butylbenzene	20.83	1.0	20	0	104	75 - 128	22.15	6.15	20	
n-Propylbenzene	21.54	1.0	20	0	108	76 - 126	22.34	3.62	20	
o-Xylene	20.1	1.0	20	0	100	78 - 122	21.05	4.64	20	
sec-Butylbenzene	21.38	1.0	20	0	107	77 - 126	22.23	3.92	20	
Styrene	19.91	1.0	20	0	99.6	78 - 123	20.92	4.94	20	
tert-Butylbenzene	21.94	1.0	20	0	110	78 - 124	22.56	2.78	20	
Tetrachloroethene	19.72	1.0	20	0	98.6	74 - 129	20.92	5.94	20	
Toluene	20.06	1.0	20	0	100	80 - 121	21.07	4.93	20	
trans-1,2-Dichloroethene	18.87	1.0	20	0	94.4	75 - 124	19.63	3.92	20	
trans-1,3-Dichloropropene	18.48	1.0	20	0	92.4	73 - 127	19.24	4.02	20	
Trichloroethene	19.46	1.0	20	0	97.3	79 - 123	20.44	4.91	20	
Trichlorofluoromethane	16.48	1.0	20	0	82.4	65 - 141	17.46	5.77	20	
Vinyl chloride	15.54	1.0	20	0	77.7	58 - 137	16.18	4.03	20	
Surr: 1,2-Dichloroethane-d4	*45.29*	*1.0*	*50*	*0*	*90.6*	*81 - 118*	*44.8*	*1.1*	*20*	
Surr: 4-Bromofluorobenzene	*48.05*	*1.0*	*50*	*0*	*96.1*	*85 - 114*	*48.67*	*1.29*	*20*	
Surr: Dibromofluoromethane	*47.18*	*1.0*	*50*	*0*	*94.4*	*80 - 119*	*46.83*	*0.749*	*20*	
Surr: Toluene-d8	*50.29*	*1.0*	*50*	*0*	*101*	*89 - 112*	*50.2*	*0.168*	*20*	

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060604

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22060604-03MSD** Units: **ug/L** Analysis Date: **13-Jun-2022 15:05**
Client ID: **35AWW05_060922** Run ID: **VOA6_410539** SeqNo: **6690151** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.55	1.0	20	0	97.8	78 - 124	20.17	3.12	20	
1,1,1-Trichloroethane	18.63	1.0	20	0	93.2	74 - 131	19.21	3.04	20	
1,1,2,2-Tetrachloroethane	19.11	1.0	20	0	95.5	71 - 121	19.88	3.98	20	
1,1,2-Trichloroethane	19.07	1.0	20	0	95.4	80 - 119	19.5	2.19	20	
1,1-Dichloroethane	19.14	1.0	20	0	95.7	77 - 125	19.79	3.37	20	
1,1-Dichloroethene	17.76	1.0	20	0	88.8	71 - 131	18.47	3.92	20	
1,1-Dichloropropene	19.52	1.0	20	0	97.6	78 - 125	20.37	4.28	20	
1,2,3-Trichlorobenzene	18.77	1.0	20	0	93.8	69 - 129	15.73	17.6	20	
1,2,3-Trichloropropane	18.98	1.0	20	0	94.9	73 - 122	20.93	9.77	20	
1,2,4-Trichlorobenzene	18.58	1.0	20	0	92.9	69 - 130	18.15	2.37	20	
1,2,4-Trimethylbenzene	20.62	1.0	20	0	103	76 - 124	21.73	5.25	20	
1,2-Dibromo-3-chloropropane	16.27	1.0	20	0	81.4	62 - 128	15.62	4.05	20	
1,2-Dibromoethane	19.18	1.0	20	0	95.9	77 - 121	19.13	0.265	20	
1,2-Dichlorobenzene	20.17	1.0	20	0	101	80 - 119	20.99	4	20	
1,2-Dichloroethane	19.51	1.0	20	0	97.5	73 - 128	18.91	3.11	20	
1,2-Dichloropropane	19.84	1.0	20	0	99.2	78 - 122	19.97	0.62	20	
1,3,5-Trimethylbenzene	20.76	1.0	20	0	104	75 - 124	22.15	6.48	20	
1,3-Dichlorobenzene	20.1	1.0	20	0	101	80 - 119	21.17	5.19	20	
1,3-Dichloropropane	19.26	1.0	20	0	96.3	80 - 119	19.71	2.31	20	
1,4-Dichlorobenzene	20.35	1.0	20	0	102	79 - 118	21.33	4.66	20	
2,2-Dichloropropane	19.08	1.0	20	0	95.4	60 - 139	20.09	5.16	20	
2-Butanone	31.96	2.0	40	0	79.9	56 - 143	29.73	7.23	20	
2-Chlorotoluene	20.01	1.0	20	0	100	79 - 122	21.53	7.3	20	
2-Hexanone	36.17	2.0	40	0	90.4	57 - 139	35.89	0.778	20	
4-Chlorotoluene	20.41	1.0	20	0	102	78 - 122	21.74	6.27	20	
4-Isopropyltoluene	21.46	1.0	20	0	107	77 - 127	22.93	6.67	20	
4-Methyl-2-pentanone	36.38	2.0	40	0	91.0	67 - 130	36.85	1.27	20	
Acetone	25.69	2.0	40	0	64.2	39 - 160	25.27	1.66	20	
Benzene	19.77	1.0	20	0	98.8	79 - 120	20.2	2.14	20	
Bromobenzene	20.61	1.0	20	0	103	80 - 120	21.84	5.78	20	
Bromochloromethane	18.51	1.0	20	0	92.5	78 - 123	19.02	2.75	20	
Bromodichloromethane	18.5	1.0	20	0	92.5	79 - 125	18.86	1.94	20	
Bromoform	18.65	1.0	20	0	93.3	66 - 130	18.81	0.856	20	
Bromomethane	15.98	1.0	20	0	79.9	53 - 141	17.15	7.05	20	

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060604

QC BATCH REPORT

Batch ID: R410539 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22060604-03MSD** Units: **ug/L** Analysis Date: **13-Jun-2022 15:05**
Client ID: **35AWW05_060922** Run ID: **VOA6_410539** SeqNo: **6690151** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	36.82	2.0	40	0	92.0	64 - 133	38.33	4.03	20	
Carbon tetrachloride	18.69	1.0	20	0	93.4	72 - 136	19.54	4.43	20	
Chlorobenzene	19.91	1.0	20	0	99.6	82 - 118	20.69	3.83	20	
Chloroethane	17.68	1.0	20	0	88.4	60 - 138	17.88	1.14	20	
Chloroform	18.39	1.0	20	0	92.0	79 - 124	18.84	2.38	20	
Chloromethane	16.08	1.0	20	0	80.4	50 - 139	16.53	2.78	20	
cis-1,2-Dichloroethene	19.68	1.0	20	0	98.4	78 - 123	19.73	0.274	20	
cis-1,3-Dichloropropene	19.04	1.0	20	0	95.2	75 - 124	19.37	1.7	20	
Dibromochloromethane	19.09	1.0	20	0	95.5	74 - 126	19.88	4.02	20	
Dibromomethane	18.75	1.0	20	0	93.7	79 - 123	19.04	1.56	20	
Dichlorodifluoromethane	10.53	1.0	20	0	52.7	32 - 152	11.32	7.21	20	
Ethylbenzene	20.18	1.0	20	0	101	79 - 121	21.33	5.5	20	
Hexachlorobutadiene	20.57	1.0	20	0	103	66 - 134	21.48	4.32	20	
Isopropylbenzene	19.64	1.0	20	0	98.2	72 - 131	20.58	4.65	20	
m,p-Xylene	40.01	2.0	40	0	100	80 - 121	42.27	5.5	20	
Methylene chloride	17.47	2.0	20	0	87.3	74 - 124	17.67	1.16	20	
Naphthalene	16.98	1.0	20	0	84.9	61 - 128	14.07	18.7	20	
n-Butylbenzene	21.08	1.0	20	0	105	75 - 128	22.42	6.17	20	
n-Propylbenzene	21	1.0	20	0	105	76 - 126	22.54	7.08	20	
o-Xylene	20.22	1.0	20	0	101	78 - 122	21.07	4.13	20	
sec-Butylbenzene	20.86	1.0	20	0	104	77 - 126	22.5	7.59	20	
Styrene	19.85	1.0	20	0	99.2	78 - 123	20.58	3.62	20	
tert-Butylbenzene	21.35	1.0	20	0	107	78 - 124	22.8	6.59	20	
Tetrachloroethene	20.34	1.0	20	0	102	74 - 129	21.56	5.81	20	
Toluene	20.19	1.0	20	0	101	80 - 121	21.11	4.44	20	
trans-1,2-Dichloroethene	19.34	1.0	20	0	96.7	75 - 124	19.77	2.17	20	
trans-1,3-Dichloropropene	18.78	1.0	20	0	93.9	73 - 127	18.9	0.649	20	
Trichloroethene	19.78	1.0	20	0	98.9	79 - 123	20.36	2.88	20	
Trichlorofluoromethane	17.15	1.0	20	0	85.7	65 - 141	18.12	5.52	20	
Vinyl chloride	16.14	1.0	20	0	80.7	58 - 137	16.64	3.04	20	
Surr: 1,2-Dichloroethane-d4	*46.3*	*1.0*	*50*	*0*	*92.6*	*81 - 118*	*46.04*	*0.55*	*20*	
Surr: 4-Bromofluorobenzene	*49.72*	*1.0*	*50*	*0*	*99.4*	*85 - 114*	*48.54*	*2.4*	*20*	
Surr: Dibromofluoromethane	*47.17*	*1.0*	*50*	*0*	*94.3*	*80 - 119*	*47.1*	*0.16*	*20*	
Surr: Toluene-d8	*49.33*	*1.0*	*50*	*0*	*98.7*	*89 - 112*	*49.96*	*1.27*	*20*	

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS22060604

QC BATCH REPORT

Batch ID: R410539 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:

HS22060604-01	HS22060604-02	HS22060604-03	HS22060604-04
HS22060604-05	HS22060604-06	HS22060604-07	HS22060604-08

ALS Houston, US Date: 24-Jun-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: **HS22060604**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

ALS Houston, US Date: 24-Jun-22

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
California	2919 2022-2023	30-Apr-2023
Dept of Defense	L21-682	31-Dec-2023
Florida	E87611-34	30-Jun-2022
Illinois	2000322022-9	09-May-2023
Kansas	E-10352 2021-2022	31-Jul-2022
Kentucky	123043, 2022-2023	30-Apr-2023
Louisiana	03087, 2021-2022	30-Jun-2022
Maryland	343, 2022-2023	30-Jun-2023
North Carolina	624-2022	31-Dec-2022
Oklahoma	2021-080	31-Aug-2022
Texas	T104704231-22-29	30-Apr-2023
Utah	TX026932021-12	30-Jul-2022

ALS Houston, US Date: 24-Jun-22

Sample Receipt Checklist

Work Order ID: HS22060604 **Date/Time Received:** **10-Jun-2022 09:10**

Client Name: Bhate Environmental **Received by:** **Pablo Marinez**

Completed By: */S/ Nilesh D. Ranchod* (eSignature) 10-Jun-2022 19:18 (Date/Time) **Reviewed by:** */S/ Dane J. Wacasey* (eSignature) 23-Jun-2022 19:07 (Date/Time)

Matrices: **W** Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	0.9uc/1.4c	IR31
Cooler(s)/Kit(s):	48797	
Date/Time sample(s) sent to storage:	6/10/22	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

bhate

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: ____ of ____

Project/Phase No: NWQ1312.0150

COC Number(1): ____

LIMS Number: ____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 58

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	MEE	TOC	Carbon Dioxide	Anions	Arsenic	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
35AWW17_060922	09 JUN 2022	0730	-	N		WG	3	X									
35AWW18_060922	09 JUN 2022	0815	-	N		WG	3	X									
35AWW05_060922	09 JUN 2022	0900	-	N		WG	3	X									
35AWW05_060922_MS	09 JUN 2022	0900		MS		WG	3	X									
35AWW05_060922_MSD	09 JUN 2022	0900		SD		WG	3	X									
35AWW16_060922	09 JUN 2022	0945	-	N		WG	3	X									
35AWW16_060922_MS	09 JUN 2022	0945	-	MS		WG	3	X									
35AWW16_060922_MSD	09 JUN 2022	0945	-	SD		WG	3	X									
35AWW15_060922	09 JUN 2022	1030	-	N		WG	3	X									
HSMW06_060922	09 JUN 2022	1115	-	N		WG	4	X					X				
35AWW21_060922	09 JUN 2022	1200	-	N		WG	3	X									

Sample Analysis Requested (5) | Quality Assurance Samples (6)

HS22060604

Bhate Environmental Associates, Inc.
LHAAP-58

COMMENTS: STANDARD TAT

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	6/9/22	1400	1. Paul Kunz	6/10/22	9:10
2.			2.		
3.			3.		

92797
0 4c
1127, CPM, C

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: ____ Shipped No.:

____ Method of Shipment: ____

____ Fed Ex ____ Airbill Number:

____ Analytical Lab: ALS 10450 Stanciff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN Dane Wagasey Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

01154807

Bhate

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 58

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Sample Analysis Requested (5): Number of containers	VOC	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
TRIP BLANK	09 JUN 2022		-	TB		W	2	X				
			-									
			-									
			-									
			-									
			-									
			-									
			-									

HS22060604
Bhate Environmental Associates, Inc.
LHAAP-58

COMMENTS: ____

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	6/9/22	1400	1. [signature]	6/10/22	9:10
2.			2.		
3.			3.		

46747
0.9C/R3i LPLo S

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: ____ Shipped ____ No.:

Method of Shipment: ____

Fed Ex ____ Airbill Number: ____

Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

[redacted]

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 [illegible]

45797

CUSTODY SEAL
Date: 6/9/22 Time: 1400
Name: [illegible]
Company: [illegible]

Seal Broken By:
Date: 06/10/22

45797

45797

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 25MAY22
ACTWGT: 1.00 LB MAN
CAD: 0221247/CAFE3512
DIMS: 26x14x14 IN

TO SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP - 58 - BO 85517 - DW

RMA: [redacted]

FedEx Express

FRI - 10 JUN AA
PRIORITY OVERNIGHT

0221 5300 5231 9607

AB SGRA

77099
TX-US
IAH

4230674 09Jun2022 CGGA 560C2/7746/C0B8

July 05, 2022 Service Request No:R2205267

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

Laboratory Results for: LHAAP / Site 58

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory June 09, 2022
For your reference, these analyses have been assigned our service request number **R2205267.**

All testing was performed according to our laboratory's quality assurance program and met the requirements of the TNI standards except as noted in the case narrative report. Any testing not included in the lab's accreditation is identified on a Non-Certified Analytes report. All results are intended to be considered in their entirety. ALS Environmental is not responsible for use of less than the complete report. Results apply only to the individual samples submitted to the lab for analysis, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s), and represented by Laboratory Control Sample control limits. Any events, such as QC failures or Holding Time exceedances, which may add to the uncertainty are explained in the report narrative or are flagged with qualifiers. The flags are explained in the Report Qualifiers and Definitions page of this report.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Nicole Mansen
Project Manager

ADDRESS 1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
PHONE +1 585 288 5380 | FAX +1 585 288 8475
ALS Group USA, Corp.
dba ALS Environmental

Narrative Documents

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

1565 Jefferson Rd, Building 300, Rochester, NY 14623 | 585-288-5380 | www.alsglobal.com

Client: ALS Environmental - US
Project: LHAAP / Site 58
Sample Matrix: Water

Service Request: R2205267
Date Received: 06/09/2022

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

Six water samples were received for analysis at ALS Environmental on 06/09/2022. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Semivoa GC:

No significant anomalies were noted with this analysis.

Approved by _____ Date 07/05/2022

Sample Receipt Information

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client: ALS Environmental - US **Service Request:**R2205267
Project: LHAAP / Site 58/NW01312.0150

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
R2205267-001	35AWW19_060822	6/8/2022	0715
R2205267-002	35AWW23_060822	6/8/2022	0805
R2205267-003	35AWW06_060822	6/8/2022	0900
R2205267-004	LHSMW07_060822	6/8/2022	0950
R2205267-005	35AWW20_060822	6/8/2022	1045
R2205267-006	35AWW11_060822	6/8/2022	1140

bhate ENVIRONMENTAL CONSTRUCTION UNLIMITED

Page: of

Project/Phase No: NWO1312.0150

COC Number(1):

LIMS Number:

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 58

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	Volatile Fatty Acids										Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
							Sample Analysis Requested (5)											Quality Assurance Samples (6)			
35AWW19_060822	08 Jun 2022	0715	-	N	-	WG	1	X													
35AWW23_060822	08 Jun 2022	0805	-	N		WG	1	X													
35AWW06_060822	08 Jun 2022	0900	-	N		WG	1	X													
LHSMW07_060822	08 Jun 2022	0950		N		WG	1	X													
35AWW20_060822	08 Jun 2022	1045		N		WG	1	X													
35AWW11_060822	08 Jun 2022	1140	-	N		WG	1	X													
			-																		
			-																		
			-																		
			-																		
			-																		

COMMENTS: STANDARD TAT

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received By (Signed)	Date	Time
1. Scott Beesinger	6/8/22	1400	1.	6/9/22	09150
2.			2.		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: Shipped No.:

Method of Shipment:

Fed Ex Airbill Number:

Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: Dane Wiesesey Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment B

R2205267
ALS Environmental - US
LHAAP / Site 58
5

R2205267 5
ALS Environmental - US
LHAAP / Site 69

Cooler Receipt and Preservation

Project/Client Bhate Folder Number

Cooler received on 6/9/22 by: ME

COURIER: ALS UPS (FEDEX) VELOCITY CLIENT

1	Were Custody seals on outside of cooler?	(Y) N	5a	Perchlorate samples have required headspace?	Y N (NA)
2	Custody papers properly completed (ink, signed)?	(Y) N	5b	Did VOA vials, Alk,or Sulfide have sig* bubbles?	Y N (NA)
3	Did all bottles arrive in good condition (unbroken)?	(Y) N	6	Where did the bottles originate?	(ALS/ROC) CLIENT
4	Circle: (Wet Ice) Dry Ice Gel packs present?	(Y) N	7	Soil VOA received as: Bulk Encore 5035set	(NA)

8. Temperature Readings Date: 6/9/22 Time: 09:57 ID: IR#7 (IR#11) From: (Temp Blank) Sample Bottle

Observed Temp (°C)	2.7						
Within 0-6°C?	(Y) N	Y N	Y N	Y N	Y N	Y N	Y N
If <0°C, were samples frozen?	Y N	Y N	Y N	Y N	Y N	Y N	Y N

If out of Temperature, note packing/ice condition: _____ Ice melted Poorly Packed (described below) Same Day Rule

&Client Approval to Run Samples: _____ Standing Approval Client aware at drop-off Client notified by: _____

All samples held in storage location: R-002 by ME on 6/9/22 at 10:01

5035 samples placed in storage location: _____ by _____ on _____ at _____ within 48 hours of sampling? Y N

Cooler Breakdown/Preservation Check**: Date: 6/10/22 Time: 15:00 by: SES

9. Were all bottle labels complete (*i.e.* analysis, preservation, etc.)? (YES) NO
10. Did all bottle labels and tags agree with custody papers? (YES) NO
11. Were correct containers used for the tests indicated? (YES) NO
12. Were 5035 vials acceptable (no extra labels, not leaking)? YES NO (N/A)
13. Air Samples: Cassettes / Tubes Intact Y / N with MS Y / N Canisters Pressurized Tedlar® Bags Inflated (N/A)

pH	Lot of test paper	Reagent	Preserved? Yes	Preserved? No	Lot Received	Exp	Sample ID Adjusted	Vol. Added	Lot Added	Final pH
≥12		NaOH								
≤2		HNO_3								
≤2		H_2SO_4								
<4		$NaHSO_4$								
5-9		For 608pest			No=Notify for 3day					
Residual Chlorine (-)		For CN, Phenol, 625, 608pest, 522			If +, contact PM to add $Na_2S_2O_3$ (625, 608, CN), ascorbic (phenol).					
		$Na_2S_2O_3$								
		ZnAcetate	-	-			**VOAs and 1664 Not to be tested before analysis. Otherwise, all bottles of all samples with chemical preservatives are checked (not just representatives).			
		HCl	**	**						

Bottle lot numbers: 90121-06

Explain all Discrepancies/ Other Comments:

H_3PO_4 lot # 214482 Exp. 05/22

HPROD	BULK
HTR	FLDT
SUB	HGFB
ALS	LL3541

Labels secondary reviewed by: _____

PC Secondary Review: _____

*significant air bubbles: VOA > 5-6 mm : WC >1 in. diameter

ALS Group USA, Corp.
dba ALS Environmental

Internal Chain of Custody Report

Client: ALS Environmental - US **Service Request:** R2205267
Project: LHAAP / Site 58/NW01312.0150

Bottle ID	Methods	Date	Time	Sample Location / User	Disposed On
R2205267-001.01					
	Organic Acids				
		6/10/2022	1504	SMO / GESMERIAN	
		6/10/2022	1510	R-002 / GESMERIAN	
		6/21/2022	0814	In Lab / AFELSER	
		6/21/2022	0921	R-002 / AFELSER	
		6/29/2022	1350	In Lab / AFELSER	
		6/29/2022	1435	R-002 / AFELSER	
R2205267-002.01					
	Organic Acids				
		6/10/2022	1504	SMO / GESMERIAN	
		6/10/2022	1510	R-002 / GESMERIAN	
		6/21/2022	0814	In Lab / AFELSER	
		6/21/2022	0921	R-002 / AFELSER	
		6/29/2022	1350	In Lab / AFELSER	
		6/29/2022	1435	R-002 / AFELSER	
R2205267-003.01					
	Organic Acids				
		6/10/2022	1504	SMO / GESMERIAN	
		6/10/2022	1510	R-002 / GESMERIAN	
		6/21/2022	0814	In Lab / AFELSER	
		6/21/2022	0921	R-002 / AFELSER	
		6/29/2022	1350	In Lab / AFELSER	
		6/29/2022	1435	R-002 / AFELSER	
R2205267-004.01					
	Organic Acids				
		6/10/2022	1504	SMO / GESMERIAN	
		6/10/2022	1510	R-002 / GESMERIAN	
		6/21/2022	0814	In Lab / AFELSER	
		6/21/2022	0921	R-002 / AFELSER	
		6/29/2022	1350	In Lab / AFELSER	
		6/29/2022	1435	R-002 / AFELSER	
R2205267-005.01					
	Organic Acids				
		6/10/2022	1504	SMO / GESMERIAN	
		6/10/2022	1510	R-002 / GESMERIAN	
		6/21/2022	0814	In Lab / AFELSER	
		6/21/2022	0921	R-002 / AFELSER	
		6/29/2022	1350	In Lab / AFELSER	
		6/29/2022	1435	R-002 / AFELSER	
R2205267-006.01					

ALS Group USA, Corp.
dba ALS Environmental

Internal Chain of Custody Report

Client: ALS Environmental - US **Service Request:** R2205267
Project: LHAAP / Site 58/NW01312.0150

Bottle ID	Methods	Date	Time	Sample Location / User	Disposed On
	Organic Acids				
		6/10/2022	1504	SMO / GESMERIAN	
		6/10/2022	1510	R-002 / GESMERIAN	
		6/21/2022	0814	In Lab / AFELSER	
		6/21/2022	0921	R-002 / AFELSER	
		6/29/2022	1350	In Lab / AFELSER	
		6/29/2022	1435	R-002 / AFELSER	

Miscellaneous Forms

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

ALS Environmental

REPORT QUALIFIERS AND DEFINITIONS

U	Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
J	Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Arclors).
B	Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
E	Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
E	Organics- Concentration has exceeded the calibration range for that specific analysis.
D	Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
*	Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
H	Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
#	Spike was diluted out.
+	Correlation coefficient for MSA is <0.995.
N	Inorganics- Matrix spike recovery was outside laboratory limits.
N	Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
S	Concentration has been determined using Method of Standard Additions (MSA).
W	Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
P	Concentration >40% difference between the two GC columns.
C	Confirmed by GC/MS
Q	DoD reports: indicates a pesticide/Aroclor is not confirmed (≥100% Difference between two GC columns).
X	See Case Narrative for discussion.
MRL LOQ	Method Reporting Limit. Also known as: Limit of Quantitation (LOQ) The lowest concentration at which the method analyte may be reliably quantified under the method conditions.
MDL	Method Detection Limit. A statistical value derived from a study designed to provide the lowest concentration that will be detected 99% of the time. Values between the MDL and MRL are estimated (see J qualifier).
LOD	Limit of Detection. A value at or above the MDL which has been verified to be detectable.
ND	Non-Detect. Analyte was not detected at the concentration listed. Same as U qualifier.

Rochester Lab ID # for Accreditations[1]

NELAP State Accreditation #
Florida ID # E87674
New Hampshire ID # 2941
New York ID # 10145
Pennsylvania ID# 68-786
Virginia #460167

Non-NELAP State Accreditation #
Connecticut ID #PH0556
Delaware Approved
Maine ID #NY01587
North Carolina #36701
North Carolina #676
Rhode Island ID #LAO00333

PJLA Testing DoD ELAP
Accreditation #65817

[1] Analyses were performed according to the current DoD Quality Systems Manual, our laboratory's NELAP-approved quality assurance program and any applicable state or agency requirements. The test results meet requirements of the current requirements, where applicable, except as noted in the case narrative. This report may contain results which are not accredited. For a specific list of accredited analytes, contact the laboratory or go to https://www.alsglobal.com/locations/americas/north-america/usa/new-york/rochester-environmental

ALS Laboratory Group

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

ALS Group USA, Corp.
dba ALS Environmental

Client: ALS Environmental - US **Service Request:** R2205267
Project: LHAAP / Site 58/NW01312.0150

Non-Certified Analytes

Certifying Agency: New York Department of Health

Method	Matrix	Analyte
Organic Acids	Water	Acetic Acid
Organic Acids	Water	Butanoic Acid (Butyric Acid)
Organic Acids	Water	Lactic Acid
Organic Acids	Water	Propionic Acid
Organic Acids	Water	Pyruvic Acid

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client:	ALS Environmental - US	**Service Request:**	R2205267
Project:	LHAAP / Site 58/NW01312.0150		

Sample Name:	35AWW19_060822	**Date Collected:**	06/8/22
Lab Code:	R2205267-001	**Date Received:**	06/9/22
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		AFELSER

Sample Name:	35AWW23_060822	**Date Collected:**	06/8/22
Lab Code:	R2205267-002	**Date Received:**	06/9/22
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		AFELSER

Sample Name:	35AWW06_060822	**Date Collected:**	06/8/22
Lab Code:	R2205267-003	**Date Received:**	06/9/22
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		AFELSER

Sample Name:	LHSMW07_060822	**Date Collected:**	06/8/22
Lab Code:	R2205267-004	**Date Received:**	06/9/22
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		AFELSER

Sample Name:	35AWW20_060822	**Date Collected:**	06/8/22
Lab Code:	R2205267-005	**Date Received:**	06/9/22
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		AFELSER

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Analyst Summary report

Client:	ALS Environmental - US	**Service Request:**	R2205267
Project:	LHAAP / Site 58/NW01312.0150		

Sample Name:	35AWW11_060822	**Date Collected:**	06/8/22
Lab Code:	R2205267-006	**Date Received:**	06/9/22
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		AFELSER

INORGANIC PREPARATION METHODS

The preparation methods associated with this report are found in these tables unless discussed in the case narrative.

Water/Liquid Matrix

Analytical Method	Preparation Method
200.7	200.2
200.8	200.2
6010C	3005A/3010A
6020A	ILM05.3
9034 Sulfide Acid Soluble	9030B
SM 4500-CN-E Residual Cyanide	SM 4500-CN-G
SM 4500-CN-E WAD Cyanide	SM 4500-CN-I

Solid/Soil/Non-Aqueous Matrix

Analytical Method	Preparation Method
6010C	3050B
6020A	3050B
6010C TCLP (1311) extract	3005A/3010A
6010 SPLP (1312) extract	3005A/3010A
7199	3060A
300.0 Anions/ 350.1/ 353.2/ SM 2320B/ SM 5210B/ 9056A Anions	DI extraction
For analytical methods not listed, the preparation method is the same as the analytical method reference.	

Sample Results

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Semivolatile Organic Compounds by GC

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R2205267
Project:	LHAAP / Site 58/NW01312.0150	**Date Collected:**	06/08/22 07:15
Sample Matrix:	Water	**Date Received:**	06/09/22 09:50
Sample Name:	35AWW19_060822	**Units:**	mg/L
Lab Code:	R2205267-001	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.052	1	06/30/22 04:13	
Acetic Acid	ND U	4.0	2.0	0.56	1	06/30/22 04:13	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.77	1	06/30/22 04:13	
Lactic Acid	ND U	2.0	1.0	0.41	1	06/30/22 04:13	
Propionic Acid	ND U	4.0	1.5	1.1	1	06/30/22 04:13	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R2205267
Project:	LHAAP / Site 58/NW01312.0150	**Date Collected:**	06/08/22 08:05
Sample Matrix:	Water	**Date Received:**	06/09/22 09:50
Sample Name:	35AWW23_060822	**Units:**	mg/L
Lab Code:	R2205267-002	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.052	1	06/30/22 08:31	
Acetic Acid	**2.0 J**	4.0	2.0	0.56	1	06/30/22 08:31	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.77	1	06/30/22 08:31	
Lactic Acid	ND U	2.0	1.0	0.41	1	06/30/22 08:31	
Propionic Acid	ND U	4.0	1.5	1.1	1	06/30/22 08:31	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R2205267
Project:	LHAAP / Site 58/NW01312.0150	**Date Collected:**	06/08/22 09:00
Sample Matrix:	Water	**Date Received:**	06/09/22 09:50
Sample Name:	35AWW06_060822	**Units:**	mg/L
Lab Code:	R2205267-003	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.052	1	06/30/22 09:20	
Acetic Acid	ND U	4.0	2.0	0.56	1	06/30/22 09:20	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.77	1	06/30/22 09:20	
Lactic Acid	ND U	2.0	1.0	0.41	1	06/30/22 09:20	
Propionic Acid	ND U	4.0	1.5	1.1	1	06/30/22 09:20	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R2205267
Project:	LHAAP / Site 58/NW01312.0150	**Date Collected:**	06/08/22 09:50
Sample Matrix:	Water	**Date Received:**	06/09/22 09:50
Sample Name:	LHSMW07_060822	**Units:**	mg/L
Lab Code:	R2205267-004	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.052	1	06/30/22 10:07	
Acetic Acid	ND U	4.0	2.0	0.56	1	06/30/22 10:07	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.77	1	06/30/22 10:07	
Lactic Acid	ND U	2.0	1.0	0.41	1	06/30/22 10:07	
Propionic Acid	ND U	4.0	1.5	1.1	1	06/30/22 10:07	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R2205267
Project:	LHAAP / Site 58/NW01312.0150	**Date Collected:**	06/08/22 10:45
Sample Matrix:	Water	**Date Received:**	06/09/22 09:50
Sample Name:	35AWW20_060822	**Units:**	mg/L
Lab Code:	R2205267-005	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.052	1	06/30/22 11:42	
Acetic Acid	ND U	4.0	2.0	0.56	1	06/30/22 11:42	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.77	1	06/30/22 11:42	
Lactic Acid	ND U	2.0	1.0	0.41	1	06/30/22 11:42	
Propionic Acid	ND U	4.0	1.5	1.1	1	06/30/22 11:42	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R2205267
Project:	LHAAP / Site 58/NW01312.0150	**Date Collected:**	06/08/22 11:40
Sample Matrix:	Water	**Date Received:**	06/09/22 09:50
Sample Name:	35AWW11_060822	**Units:**	mg/L
Lab Code:	R2205267-006	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.052	1	06/30/22 12:29	
Acetic Acid	ND U	4.0	2.0	0.56	1	06/30/22 12:29	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.77	1	06/30/22 12:29	
Lactic Acid	ND U	2.0	1.0	0.41	1	06/30/22 12:29	
Propionic Acid	ND U	4.0	1.5	1.1	1	06/30/22 12:29	

QC Summary Forms

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QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	R2205267
Project:	LHAAP / Site 58/NW01312.0150	**Date Collected:**	06/08/22
Sample Matrix:	Water	**Date Received:**	06/09/22
		Date Analyzed:	06/30/22

Duplicate Matrix Spike Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name:	35AWW19_060822	**Units:**	mg/L
Lab Code:	R2205267-001	**Basis:**	NA
Analysis Method:	Organic Acids		

		Matrix Spike RQ2207558-05			Duplicate Matrix Spike RQ2207558-06					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Pyruvic Acid	ND U	20.5	20.0	103	21.4	20.0	107	73-122	4	30
Acetic Acid	ND U	19.8	20.0	99	20.6	20.0	103	80-130	4	30
Butanoic Acid (Butyric Acid)	ND U	22.4	20.0	112	23.9	20.0	120	86-128	7	30
Lactic Acid	ND U	19.6	20.0	98	20.4	20.0	102	81-114	4	30
Propionic Acid	ND U	22.7	20.0	114	22.4	20.0	112	63-153	2	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R2205267
Project:	LHAAP / Site 58/NW01312.0150	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	mg/L
Lab Code:	RQ2207558-02	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.052	1	06/30/22 01:50	
Acetic Acid	ND U	4.0	2.0	0.56	1	06/30/22 01:50	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.77	1	06/30/22 01:50	
Lactic Acid	ND U	2.0	1.0	0.41	1	06/30/22 01:50	
Propionic Acid	ND U	4.0	1.5	1.1	1	06/30/22 01:50	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NW01312.0150
Sample Matrix: Water

Service Request: R2205267
Date Analyzed: 06/30/22

Duplicate Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Units:mg/L
Basis:NA

		Lab Control Sample			Duplicate Lab Control Sample					
		RQ2207558-03			RQ2207558-04					
Analyte Name	**Analytical Method**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Pyruvic Acid	Organic Acids	20.5	20.0	102	20.6	20.0	103	73-122	<1	30
Acetic Acid	Organic Acids	20.3	20.0	102	20.4	20.0	102	80-130	<1	30
Butanoic Acid (Butyric Acid)	Organic Acids	22.3	20.0	111	22.5	20.0	113	86-128	1	30
Lactic Acid	Organic Acids	21.3	20.0	106	21.5	20.0	107	81-114	<1	30
Propionic Acid	Organic Acids	21.8	20.0	109	21.9	20.0	109	63-153	<1	30

QUALITY CONTROL SUMMARY REPORT
LHAAP-58 June 2022
Semi-Annual SAMPLING EVENT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

July 2022

Prepared For:

Longhorn Army Ammunition Plant
Karnack, Texas

Under Contract To:

U.S. Army Corps of Engineers
Tulsa District
Tulsa, Oklahoma

Contract Number: W9128F-13-D-0012
Task Order Number: W912BV17F0150

Prepared By:

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Tables

Table 1: Field Sample Identification and Laboratory Packages
Table 2: Qualified Analytical Data
Table 3: Completeness by Method

1 INTRODUCTION

Bhate reviewed 3 data packages from ALS Environmental, Houston, Texas with the analyses for volatile fatty acids subcontracted to ALS Rochester, NY., and the analyses of carbon dioxide to Pace Analytical Gulf Coast Baton Rouge, LA. The dechlorinating bacteria analysis was subcontracted to Microbial Insights in Knoxville, TN. Groundwater samples were collected June 6-9, 2022 from Site LHAAP-58 at the Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas. Data were reviewed for conformance to the requirements of the following guidance documents: *USEPA Contract Laboratory Program* [CLP] *National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA, November 2020), *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (USEPA, November 2020) and the *Final Basewide Uniform Federal Policy* [UFP] – *Quality Assurance Project Plan* [QAPP] *Longhorn Army Ammunition Plant* which is in Appendix C of the *Final Installation-Wide Work Plan for Longhorn Army Ammunition Plant Karnack, Texas* (Bhate, May 2018).

1.1 Intended Use of Data

The objective of sampling at LHAAP-58 in the second quarter of 2022 was to establish the semi-annual event.

Analyses performed include:

- RSK175 – Dissolved Gases
- E415.1– Total Organic Carbon
- SW8260C- Volatiles
- SW9056A – Anions
- HPLC-METACIDS – Volatile Fatty Acids (VFAs)
- CENSUS – Dechlorinating Bacteria (DHC/DHB)
- SW6020A - Arsenic

Table 1 lists the sample identification numbers (IDs) and their associated laboratory package.

Table 2 lists qualified results with the qualification flag and reason code.

The following narrative is a brief synopsis of data that required qualification due to quality control discrepancies.

1.2 Preservation and Holding Times

Sample identification data were evaluated for agreement with the chain-of-custody (COC). All samples were received in appropriate containers, within the proper temperature range, in good condition, and within the required hold time.

1.3 Calibrations

All analytes reported must be present in the initial and continuing calibration. The calibrations must meet the acceptance criteria specified in Worksheet 24 (Analytical Instrument Calibration) of the QAPP. All results reported must be within the calibration range. Samples were diluted, if necessary, to bring analyte responses within the calibration range

1.3.1 Continuing Calibration Verifications

The continuing calibration verification (CCV) must meet the following criteria otherwise the compound is qualified J or UJ: The CCV criteria are 20 percent difference (%D) for VOCs and 50% for closing CCVs. Metals and general chemistry - 10%D; VFAs, Dissolved Gases and TOC - 15%D.

The CCV recovery for all compounds was within control limits.

1.4 Blanks

If the analyte result for an associated sample was less than 5X (10X for common laboratory contaminants) the analyte concentration in the blank, that result was qualified “UB” and considered an artifact of blank contamination. Where the sample result for the affected analyte was non-detect or greater than 5X the amount in the blank, no qualifier was applied.

No compounds warranted blank qualification.

1.5 Surrogates

Surrogates were evaluated using limits defined by each method in the project-specific QAPP Worksheet 28.

No surrogates were reported outside control limits.

1.6 Laboratory Control Sample/Laboratory Control Sample Duplicate

Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) recoveries were evaluated using limits defined in the project-specific QAPP
Worksheet 15.

No LCS recoveries warranted qualification.

1.7 Matrix Spike/Matrix Spike Duplicate Sample

Matrix spike/matrix spike duplicate (MS/MSD) recoveries were evaluated using limits defined in Worksheet 15 of the project-specific QAPP. When sample results were greater than 4x the spike amount, control limits were not applicable and require no qualification. Furthermore, if a MS/MSD analyses was performed on a batched (unrelated) sample no qualification was made to the sample data.

No MS/MSD recoveries were outside control limits.

1.8 Internal Standards

If the %R for an internal standard in a sample is not within the limit, the associated sample is qualified for those analytes associated with the internal standard(s) outside of the limit.

Internal standards were within acceptance criteria for the associated compounds.

1.9 Field Precision

Precision is the measure of variability of individual sample measurements. Evaluation of field duplicates for precision was done using the relative percent difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. Field duplicate RPD limits were set at <30% for groundwater matrices.

No RPD exceedances were reported.

2.0 Lab Precision

The laboratory RPDs were within control limits.

2.1 DATA USABILITY SUMMARY

The data are usable for the intended purposes of the project (see Table 3). The data quality objectives have been met for the project.

Table 1: Field Sample Identification and Laboratory Packages

Client Sample ID	Lab Package/ID	E415.1	SW8260C	HPLC-METACIDS	SW9056A	RSK-175	CENSUS	Arsenic 6020A
03WW01_060622	HS22060438		X					X
35AWW01_060622	HS22060438		X					X
35AWW01_060622_a	HS22060438		X					X
35AWW05_060922	HS22060604		X					
35AWW06_060822	HS22060438/R2205267	X	X	X	X	X	X	
35AWW08_060622	HS22060438		X					X
35AWW09_060622	HS22060438		X					X
35AWW10_060622	HS22060438		X					
35AWW11_060822	HS22060453/R2205267	X	X	X	X	X	X	
35AWW12_060622	HS22060438		X					
35AWW12_060622_a	HS22060438		X					
35AWW13_060622	HS22060438		X					
35AWW14_060622	HS22060438		X					
35AWW15_060922	HS22060604		X					
35AWW16_060922	HS22060604		X					
35AWW17_060922	HS22060604		X					
35AWW18_060922	HS22060604		X					
35AWW19_060822	HS22060453/R2205267	X	X	X	X	X	X	
35AWW20_060822	HS22060453/R2205267	X	X	X	X	X	X	X
35AWW21_060922	HS22060604		X					
35AWW22_060622	HS22060438		X					
35AWW23_060822	HS22060453/R2205267	X	X	X	X	X	X	
35AWW24_060822	HS22060453		X					
35AWW24_060822_a	HS22060453		X					
LHSMW06_060922	HS22060604		X					X
LHSMW07_060822	HS22060453/R2205267	X	X	X	X	X	X	

Table 2: Qualified Analytical Data

Client Sample ID Laboratory	Laboratory Package	Analyte Name	Data Validation Qualifier	Reason for Qualification
No Qualified data				

Table 3: Completeness by Method

Method	No. of Rejected Results	% Completeness
E415.1	0	100
SW8260C	0	100
HPLC-METACIDS	0	100
SW9056A	0	100
RSK-175	0	100
CENSUS	0	100
SW6020A	0	100

E – U.S. Environmental Protection Agency method.
SW-846 - Test Methods for Evaluating Solid Waste, Physical/Chemical Methods
HPLC - High Performance Liquid Chromatography

APPENDIX G
MANN-KENDALL TREND TEST RESULTS

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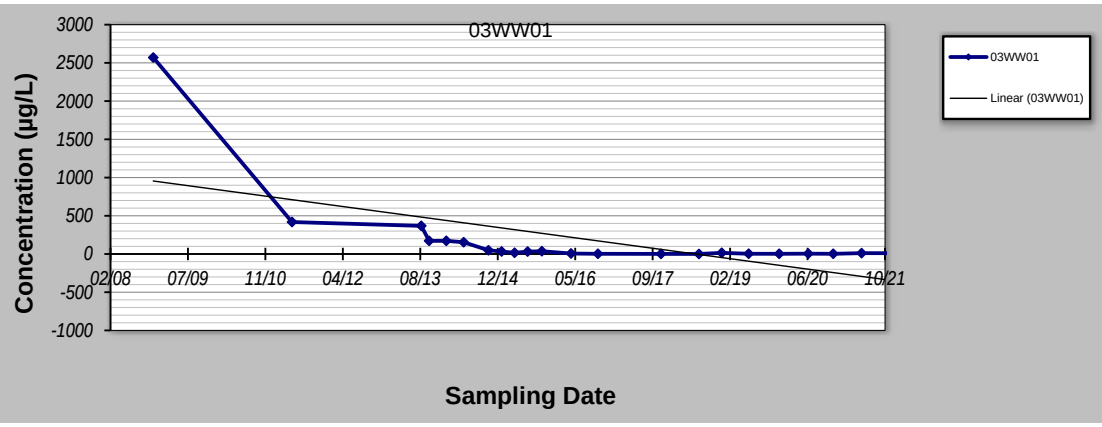
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 9/14/2022
Facility Name: LHAAP-58
Conducted By: Zachary Beck

Job ID: NWO1312.0150
Constituent: Tetrachloroethene
Concentration Units: µg/L

Sampling Point ID: 03WW01

Sampling Event	Sampling Date	TETRACHLOROETHENE CONCENTRATION (µg/L)
1	24-Nov-08	2570
2	9-May-11	418
3	20-Aug-13	368
4	10-Oct-13	172
5	29-Jan-14	172
6	21-May-14	154
7	28-Oct-14	48.6
8	21-Jan-15	32.8
9	15-Apr-15	15.9
10	8-Jul-15	31.4
11	8-Oct-15	36.4
12	13-Apr-16	6.49
13	4-Oct-16	*2.5*
14	15-Nov-17	*1.25*
15	18-Jul-18	*0.25*
16	12-Dec-18	15
17	4-Jun-19	3.2
18	18-Dec-19	*2.5*
19	23-Jun-20	4.5
20	1-Dec-20	*2.5*
21	2-Jun-21	11
22	6-Jun-22	9.9
23		
24		
25		
Coefficient of Variation:		2.94
Mann-Kendall Statistic (S):		-155
Confidence Factor:		>99.9%
Concentration Trend:		Decreasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.
4 *ND values are shown in red italics as 1/2 the limit of detection.*

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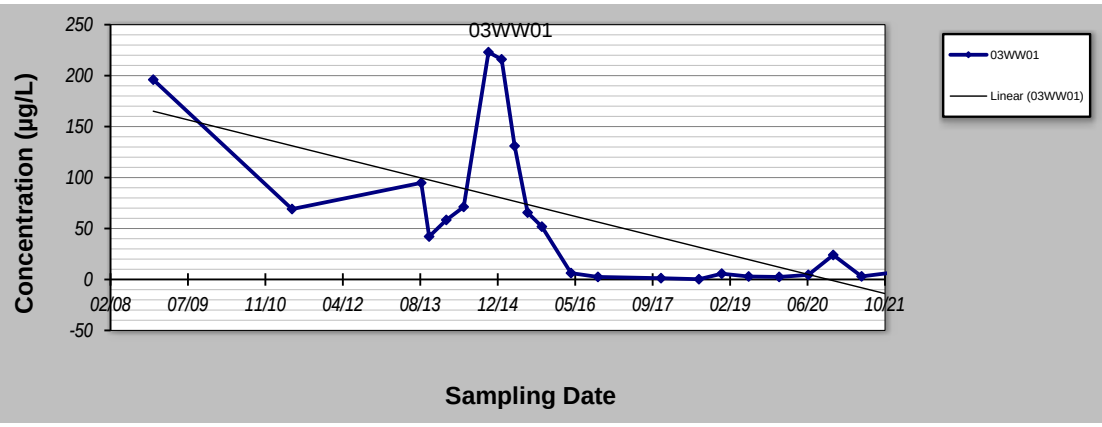
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **3-Aug-21**
Facility Name: **LHAAP-58**
Conducted By: **Zachary Beck**

Job ID: **NWO1312.0150**
Constituent: **Trichloroethene**
Concentration Units: **µg/L**

Sampling Point ID: **03WW01**

Sampling Event	Sampling Date	TRICHLOROETHENE CONCENTRATION (µg/L)
1	24-Nov-08	196
2	9-May-11	69.1
3	20-Aug-13	94.8
4	10-Oct-13	42.1
5	29-Jan-14	58.4
6	21-May-14	71.2
7	28-Oct-14	223
8	21-Jan-15	216
9	15-Apr-15	131
10	8-Jul-15	65.6
11	8-Oct-15	51.8
12	13-Apr-16	*6.25*
13	4-Oct-16	*2.5*
14	15-Nov-17	*1.25*
15	18-Jul-18	*0.25*
16	12-Dec-18	5.7
17	4-Jun-19	2.9
18	18-Dec-19	*2.5*
19	23-Jun-20	4.5
20	1-Dec-20	24
21	2-Jun-21	3
22	6-Jun-22	10
23		
24		
25		
Coefficient of Variation:		1.24
Mann-Kendall Statistic (S):		-110
Confidence Factor:		99.9%
Concentration Trend:		Decreasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.
4 *ND values are shown in red italics as 1/2 the limit of detection.*

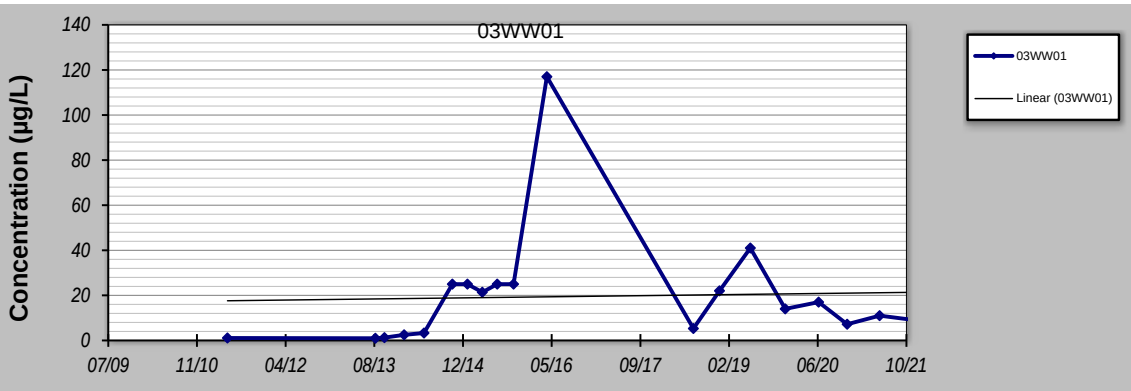
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GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	14-Sep-22	Job ID:	NWO1312.0150
Facility Name:	LHAAP-58	Constituent:	CIS-1,2-DICHLOROETHENE
Conducted By:	Zachary Beck	Concentration Units:	µg/L

Sampling Point ID: **03WW01**

Sampling Event	Sampling Date	CIS-1,2-DICHLOROETHENE CONCENTRATION (µg/L)
1	9-May-11	1.1
2	20-Aug-13	0.978
3	10-Oct-13	*1.25*
4	29-Jan-14	*2.5*
5	21-May-14	3.3
6	28-Oct-14	*25*
7	21-Jan-15	*25*
8	15-Apr-15	21.4
9	8-Jul-15	*25*
10	8-Oct-15	*25*
11	13-Apr-16	117
12	18-Jul-18	5.3
13	12-Dec-18	22
14	4-Jun-19	41
15	18-Dec-19	14
16	23-Jun-20	17
17	1-Dec-20	7.2
18	2-Jun-21	11
19	6-Jun-22	7.3
20		
Coefficient of Variation:		**1.33**
Mann-Kendall Statistic (S):		**41**
Confidence Factor:		**91.8%**
Concentration Trend:		Prob. Increasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.
4. *ND values are shown in red italics as 1/2 the limit of detection.*

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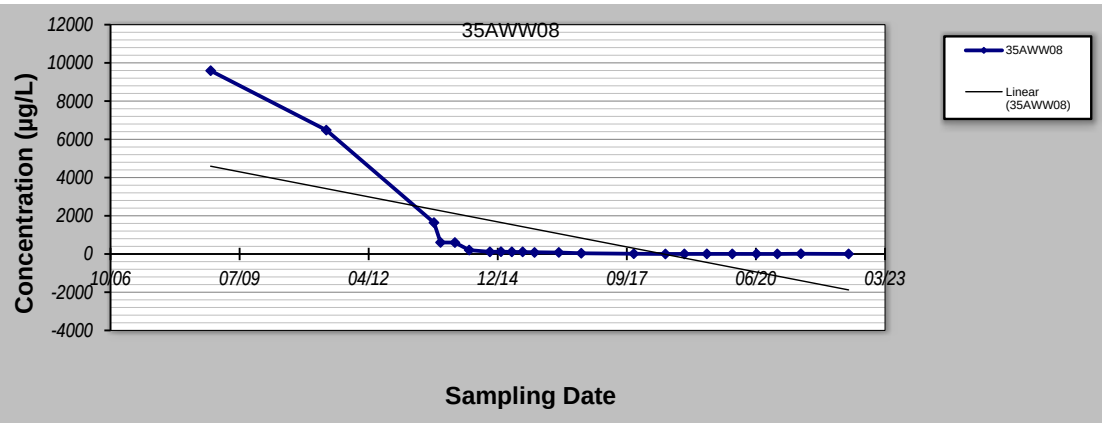
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **14-Sep-22**
Facility Name: **LHAAP-58**
Conducted By: **Zachary Beck**

Job ID: **NWO1312.0150**
Constituent: **Tetrachloroethene**
Concentration Units: **µg/L**

Sampling Point ID: **35AWW08**

Sampling Event	Sampling Date	TETRACHLOROETHENE CONCENTRATION (µg/L)
1	24-Nov-08	9590
2	9-May-11	6480
3	20-Aug-13	1640
4	10-Oct-13	603
5	29-Jan-14	599
6	20-May-14	204
7	27-Oct-14	112
8	21-Jan-15	119
9	15-Apr-15	110
10	8-Jul-15	110
11	8-Oct-15	79
12	13-Apr-16	80.1
13	4-Oct-16	36.9
14	15-Nov-17	12
15	18-Jul-18	*1.25*
16	12-Dec-18	*2.5*
17	4-Jun-19	4.8
18	18-Dec-19	*2.5*
19	23-Jun-20	6.7
20	1-Dec-20	*2.5*
21	2-Jun-21	*12.5*
22	6-Jun-22	*2.5*
23		
24		
25		
Coefficient of Variation:		**2.65**
Mann-Kendall Statistic (S):		**-186**
Confidence Factor:		**>99.9%**
Concentration Trend:		Decreasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.
4 *ND values are shown in red italics as 1/2 the limit of detection.*

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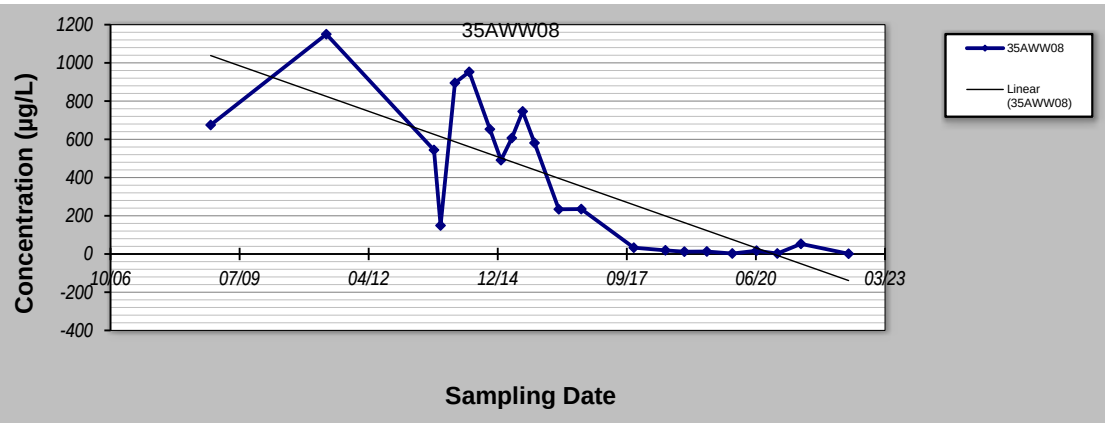
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **14-Sep-22**
Facility Name: **LHAAP-58**
Conducted By: **Elizabeth Rhine**

Job ID: **NWO1312.0150**
Constituent: **Trichloroethene**
Concentration Units: **µg/L**

Sampling Point ID: **35AWW08**

Sampling Event	Sampling Date	TRICHLOROETHENE CONCENTRATION (µg/L)
1	24-Nov-08	675
2	9-May-11	1150
3	20-Aug-13	544
4	10-Oct-13	149
5	29-Jan-14	895
6	20-May-14	953
7	27-Oct-14	653
8	21-Jan-15	491
9	15-Apr-15	607
10	8-Jul-15	746
11	8-Oct-15	581
12	13-Apr-16	234
13	4-Oct-16	235
14	15-Nov-17	33
15	18-Jul-18	19
16	12-Dec-18	12
17	4-Jun-19	13
18	18-Dec-19	*2.5*
19	23-Jun-20	17
20	1-Dec-20	*2.5*
21	2-Jun-21	53
22	6-Jun-22	*1.25*
23		
24		
25		
Coefficient of Variation:		**1.01**
Mann-Kendall Statistic (S):		**-156**
Confidence Factor:		**>99.9%**
Concentration Trend:		Decreasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.
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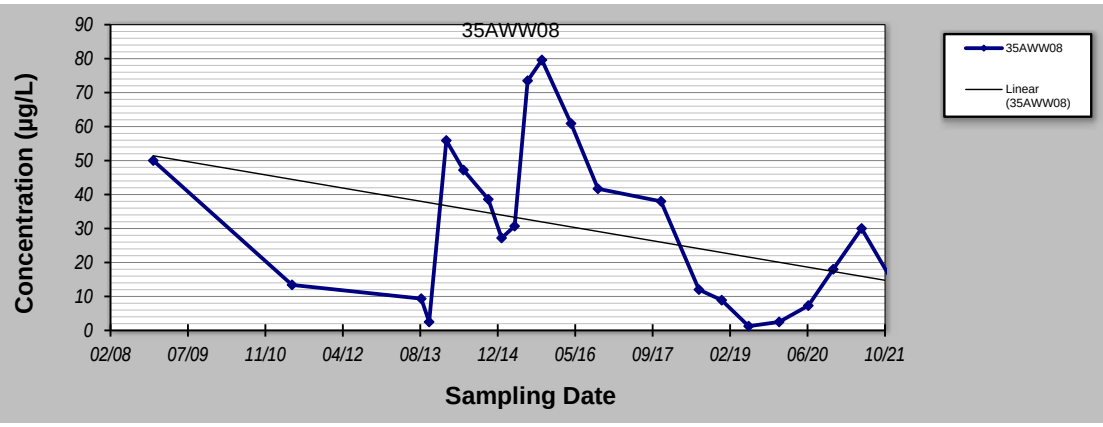
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **3-Aug-21**
Facility Name: **LHAAP-58**
Conducted By: **Zachary Beck**

Job ID: **NWO1312.0150**
Constituent: **CIS-1,2-DICHLOROETHENE**
Concentration Units: **µg/L**

Sampling Point ID: **35AWW08**

Sampling Event	Sampling Date	CIS-1,2-DICHLOROETHENE CONCENTRATION (µg/L)
1	24-Nov-08	*50*
2	9-May-11	13.4
3	20-Aug-13	9.35
4	10-Oct-13	*2.5*
5	29-Jan-14	55.9
6	20-May-14	47.2
7	27-Oct-14	38.6
8	21-Jan-15	27.2
9	15-Apr-15	30.7
10	8-Jul-15	73.5
11	8-Oct-15	79.6
12	13-Apr-16	60.9
13	4-Oct-16	41.7
14	15-Nov-17	38
15	18-Jul-18	12
16	12-Dec-18	8.9
17	4-Jun-19	*1.25*
18	18-Dec-19	*2.5*
19	23-Jun-20	7.3
20	1-Dec-20	18
21	2-Jun-21	30
22	6-Jun-22	*1.25*
23		
24		
25		
Coefficient of Variation:		**0.82**
Mann-Kendall Statistic (S):		**-67**
Confidence Factor:		**96.9%**
Concentration Trend:		Decreasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.
4 *ND values are shown in red italics as 1/2 the limit of detection.*

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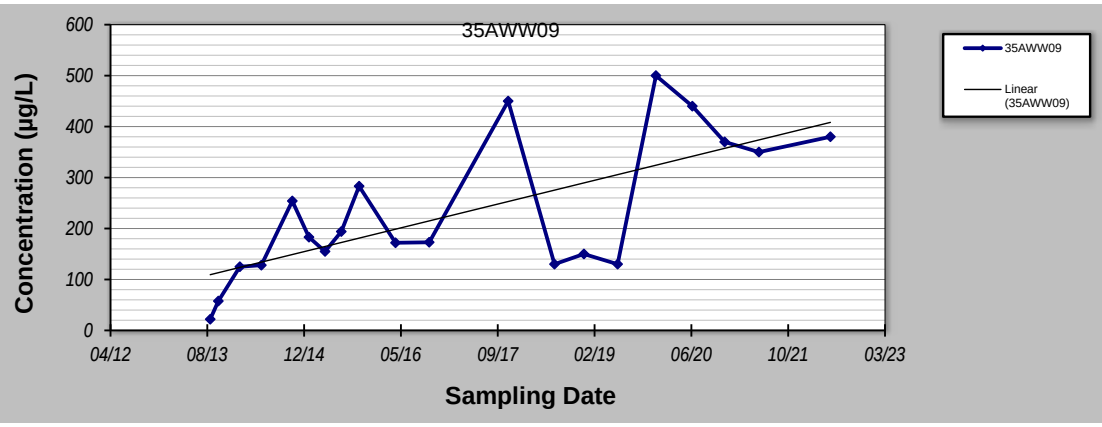
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 3-Aug-21
Facility Name: LHAAP-58
Conducted By: Zachary Beck

Job ID: NWO1312.0150
Constituent: Tetrachloroethene
Concentration Units: µg/L

Sampling Point ID: 35AWW09

Sampling Event	Sampling Date	TETRACHLOROETHENE CONCENTRATION (µg/L)
1	29-Aug-13	21.9
2	10-Oct-13	57.6
3	29-Jan-14	125
4	20-May-14	128
5	27-Oct-14	254
6	21-Jan-15	183
7	14-Apr-15	155
8	7-Jul-15	194
9	7-Oct-15	283
10	12-Apr-16	172
11	3-Oct-16	173
12	15-Nov-17	450
13	12-Jul-18	130
14	11-Dec-18	150
15	3-Jun-19	130
16	18-Dec-19	500
17	23-Jun-20	440
18	7-Dec-20	370
19	2-Jun-21	350
20	6-Jun-22	380
21		
22		
23		
24		
25		
Coefficient of Variation:		0.59
Mann-Kendall Statistic (S):		91
Confidence Factor:		99.9%
Concentration Trend:		Increasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.
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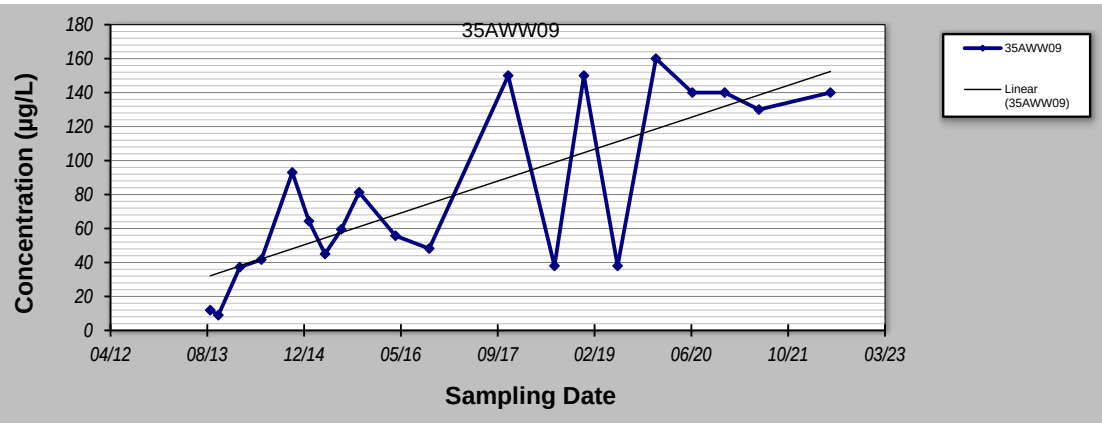
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **3-Aug-21**
Facility Name: **LHAAP-58**
Conducted By: **Zachary Beck**

Job ID: **NWO1312.0150**
Constituent: **Trichloroethene**
Concentration Units: **µg/L**

Sampling Point ID: **35AWW09**

Sampling Event	Sampling Date	TRICHLOROETHENE CONCENTRATION (µg/L)
1	29-Aug-13	11.9
2	10-Oct-13	8.97
3	29-Jan-14	37.3
4	20-May-14	41.7
5	27-Oct-14	93
6	21-Jan-15	64.3
7	14-Apr-15	45
8	7-Jul-15	59.5
9	7-Oct-15	81.3
10	12-Apr-16	55.7
11	3-Oct-16	48.2
12	15-Nov-17	150
13	12-Jul-18	38
14	11-Dec-18	150
15	3-Jun-19	38
16	18-Dec-19	160
17	23-Jun-20	140
18	7-Dec-20	140
19	2-Jun-21	130
20	6-Jun-22	140
21		
22		
23		
24		
25		
Coefficient of Variation:		0.63
Mann-Kendall Statistic (S):		87
Confidence Factor:		99.8%
Concentration Trend:		Increasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.
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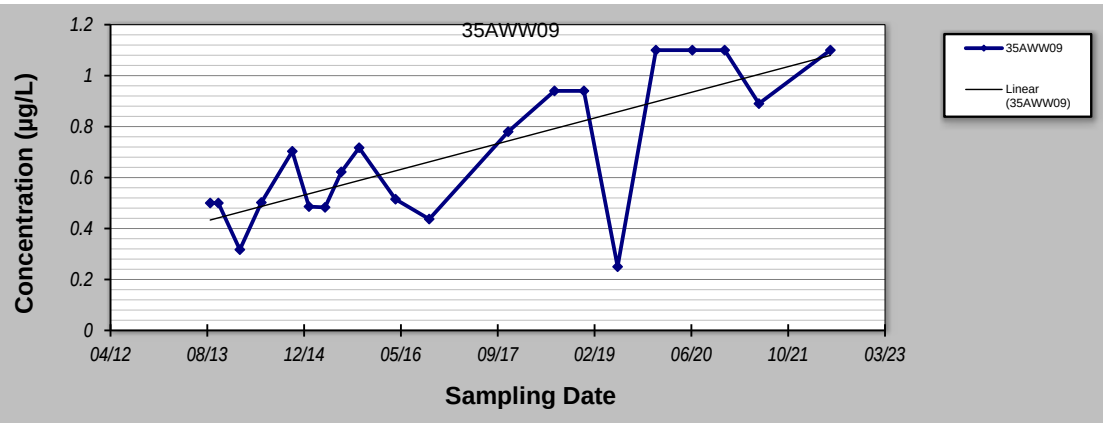
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **3-Aug-21**
Facility Name: **LHAAP-58**
Conducted By: **Zachary Beck**

Job ID: **NWO1312.0150**
Constituent: **cis-1,2-Dichloroethene**
Concentration Units: **µg/L**

Sampling Point ID: **35AWW09**

Sampling Event	Sampling Date	CIS-1,2-DICHLOROETHENE CONCENTRATION (µg/L)
1	29-Aug-13	*0.5*
2	10-Oct-13	*0.5*
3	29-Jan-14	0.317
4	20-May-14	0.502
5	27-Oct-14	0.703
6	21-Jan-15	0.486
7	14-Apr-15	0.483
8	7-Jul-15	0.622
9	7-Oct-15	0.717
10	12-Apr-16	0.515
11	3-Oct-16	0.437
12	15-Nov-17	0.78
13	12-Jul-18	0.94
14	11-Dec-18	0.94
15	3-Jun-19	*0.25*
16	18-Dec-19	1.1
17	23-Jun-20	1.1
18	7-Dec-20	1.1
19	2-Jun-21	0.89
20	6-Jun-22	1.1
21		
22		
23		
24		
25		
Coefficient of Variation:		**0.40**
Mann-Kendall Statistic (S):		**96**
Confidence Factor:		**99.9%**
Concentration Trend:		Increasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.
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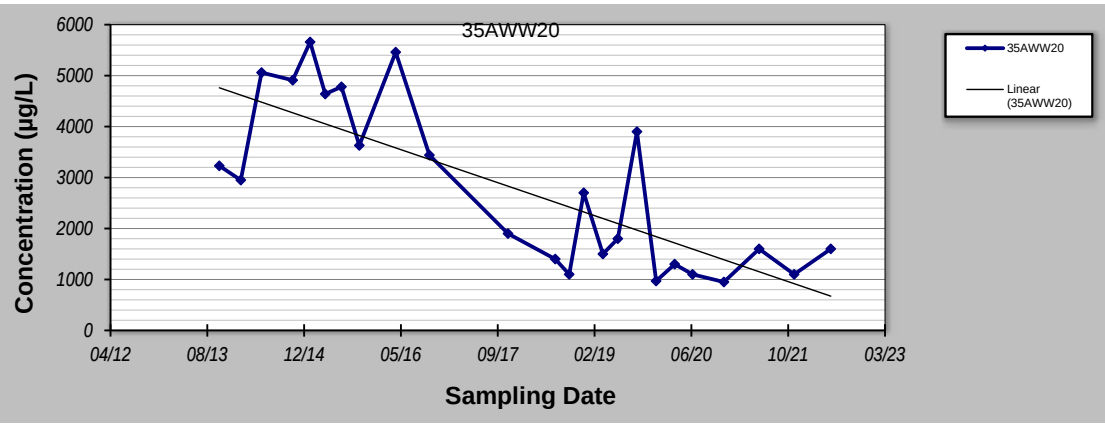
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 3-Aug-21
Facility Name: LHAAP-58
Conducted By: Zachary Beck

Job ID: NWO1312.0150
Constituent: 1,1-Dichloroethene
Concentration Units: µg/L

Sampling Point ID: 35AWW20

Sampling Event	Sampling Date	1,1-DICHLOROETHENE CONCENTRATION (µg/L)
1	15-Oct-13	3230
2	3-Feb-14	2950
3	21-May-14	5060
4	29-Oct-14	4910
5	27-Jan-15	5660
6	15-Apr-15	4640
7	8-Jul-15	4780
8	8-Oct-15	3630
9	13-Apr-16	5460
10	4-Oct-16	3440
11	14-Nov-17	1900
12	16-Jul-18	1400
13	26-Sep-18	1100
14	10-Dec-18	2700
15	19-Mar-19	1500
16	4-Jun-19	1800
17	11-Sep-19	3900
18	19-Dec-19	970
19	24-Mar-20	1300
20	24-Jun-20	1100
21	3-Dec-20	950
22	3-Jun-21	1600
23	1-Dec-21	1100
24	8-Jun-22	1600
25		
Coefficient of Variation:		0.58
Mann-Kendall Statistic (S):		-148
Confidence Factor:		>99.9%
Concentration Trend:		Decreasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.
4. *ND values are shown in red italics as 1/2 the limit of detection.*

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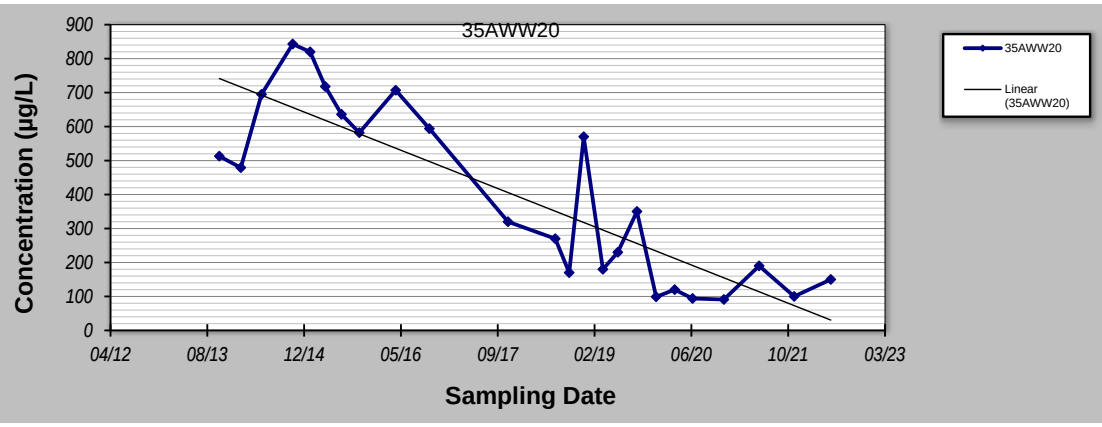
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **3-Aug-21**
Facility Name: **LHAAP-58**
Conducted By: **Zachary Beck**

Job ID: **NWO1312.0150**
Constituent: **Trichloroethene**
Concentration Units: **µg/L**

Sampling Point ID: **35AWW20**

Sampling Event	Sampling Date	TRICHLOROETHENE CONCENTRATION (µg/L)
1	15-Oct-13	513
2	3-Feb-14	479
3	21-May-14	695
4	29-Oct-14	843
5	27-Jan-15	820
6	15-Apr-15	718
7	8-Jul-15	636
8	8-Oct-15	582
9	13-Apr-16	707
10	4-Oct-16	594
11	14-Nov-17	320
12	16-Jul-18	270
13	26-Sep-18	170
14	10-Dec-18	570
15	19-Mar-19	180
16	4-Jun-19	230
17	11-Sep-19	350
18	19-Dec-19	99
19	24-Mar-20	120
20	24-Jun-20	94
21	3-Dec-20	91
22	3-Jun-21	190
23	1-Dec-21	100
24	8-Jun-22	150
25		
Coefficient of Variation:		0.65
Mann-Kendall Statistic (S):		-174
Confidence Factor:		>99.9%
Concentration Trend:		Decreasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.
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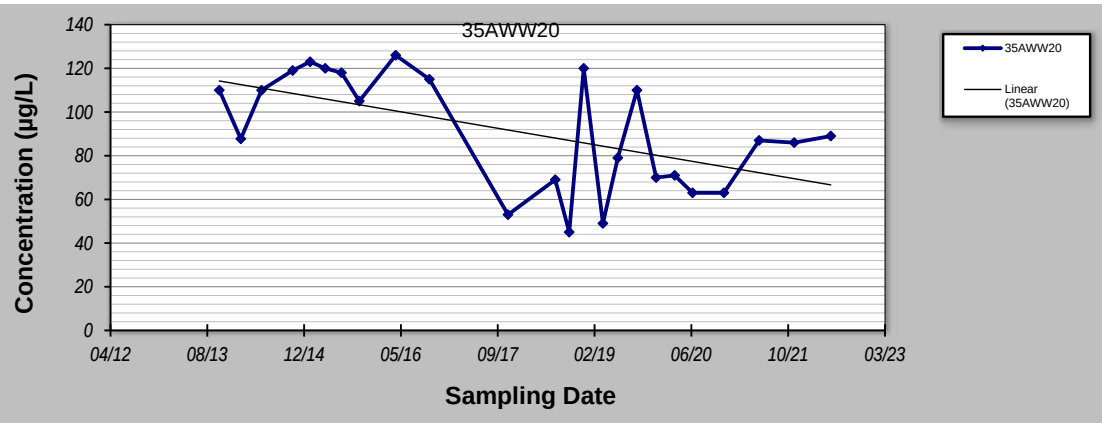
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 3-Aug-21
Facility Name: LHAAP-58
Conducted By: Zachary Beck

Job ID: NWO1312.0150
Constituent: cis-1,2-Dichloroethene
Concentration Units: µg/L

Sampling Point ID: 35AWW20

Sampling Event	Sampling Date	CIS-1,2-DICHLOROETHENE CONCENTRATION (µg/L)
1	15-Oct-13	110
2	3-Feb-14	87.7
3	21-May-14	110
4	29-Oct-14	119
5	27-Jan-15	123
6	15-Apr-15	120
7	8-Jul-15	118
8	8-Oct-15	105
9	13-Apr-16	126
10	4-Oct-16	115
11	14-Nov-17	53
12	16-Jul-18	69
13	26-Sep-18	45
14	10-Dec-18	120
15	19-Mar-19	49
16	4-Jun-19	79
17	11-Sep-19	110
18	19-Dec-19	70
19	24-Mar-20	71
20	24-Jun-20	63
21	3-Dec-20	63
22	3-Jun-21	87
23	1-Dec-21	86
24	8-Jun-22	89
25		
Coefficient of Variation:		0.29
Mann-Kendall Statistic (S):		-79
Confidence Factor:		97.4%
Concentration Trend:		Decreasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.
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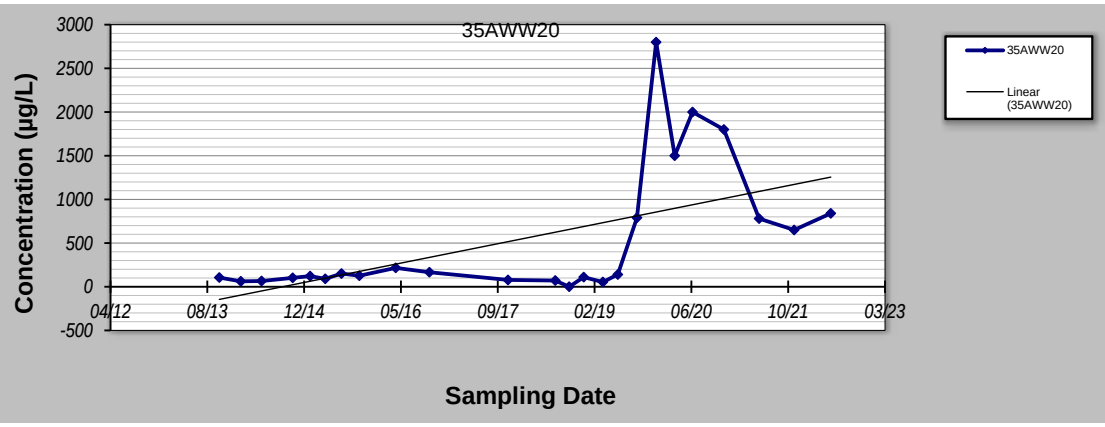
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 3-Aug-21
Facility Name: LHAAP-58
Conducted By: Zachary Beck

Job ID: NWO1312.0150
Constituent: Vinyl Chloride
Concentration Units: µg/L

Sampling Point ID: 35AWW20

Sampling Event	Sampling Date	VINYL CHLORIDE CONCENTRATION (µg/L)
1	15-Oct-13	105
2	3-Feb-14	62.4
3	21-May-14	65.7
4	29-Oct-14	102
5	27-Jan-15	122
6	15-Apr-15	90.6
7	8-Jul-15	151
8	8-Oct-15	126
9	13-Apr-16	216
10	4-Oct-16	166
11	14-Nov-17	78
12	16-Jul-18	71
13	26-Sep-18	*0.25*
14	10-Dec-18	110
15	19-Mar-19	54
16	4-Jun-19	140
17	11-Sep-19	790
18	19-Dec-19	2800
19	24-Mar-20	1500
20	24-Jun-20	2000
21	3-Dec-20	1800
22	3-Jun-21	780
23	1-Dec-21	650
24	8-Jun-22	840
25		
Coefficient of Variation:		1.41
Mann-Kendall Statistic (S):		122
Confidence Factor:		99.9%
Concentration Trend:		Increasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.
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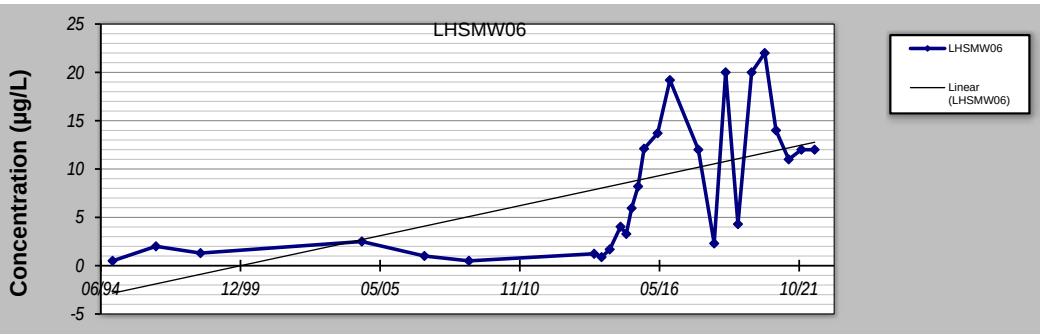
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 3-Aug-21
Facility Name: LHAAP-58
Conducted By: Zachary Beck

Job ID: NWO1312.0150
Constituent: 1,1-Dichloroethene
Concentration Units: µg/L

Sampling Point ID: LHSMW06

Sampling Event	Sampling Date	1,1-DICHLOROETHENE CONCENTRATION (µg/L)
1	1-Dec-94	*0.5*
2	13-Aug-96	2
3	13-May-98	1.3
4	8-Sep-04	*2.5*
5	21-Feb-07	*1*
6	19-Nov-08	*0.5*
7	17-Oct-13	1.23
8	31-Jan-14	0.884
9	28-May-14	1.68
10	30-Oct-14	4.03
11	21-Jan-15	3.28
12	7-Apr-15	5.95
13	9-Jul-15	8.2
14	2-Oct-15	12.1
15	13-Apr-16	13.7
16	6-Oct-16	19.2
17	17-Nov-17	12
18	2-Jul-18	2.3
19	13-Dec-18	20
20	7-Jun-19	4.3
21	20-Dec-19	20
22	25-Jun-20	22
23	3-Dec-20	14
24	3-Jun-21	11
25	2-Dec-21	12
26	9-Jun-22	12
27		
28		
29		
30		
Coefficient of Variation:		0.89
Mann-Kendall Statistic (S):		192
Confidence Factor:		>99.9%
Concentration Trend:		Increasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
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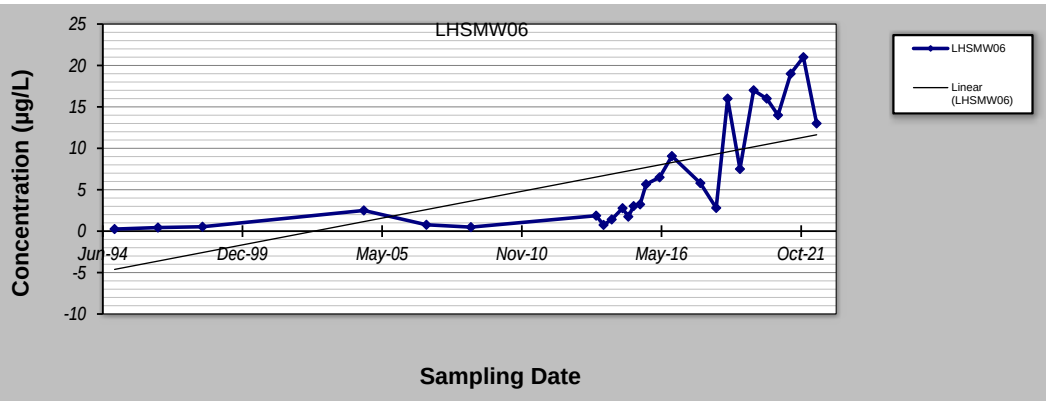
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 3-Aug-21
Facility Name: LHAAP-58
Conducted By: Zachary Beck

Job ID: NWO1312.0150
Constituent: Trichloroethene
Concentration Units: µg/L

Sampling Point ID: LHSMW06

Sampling Event	Sampling Date	TRICHLOROETHENE CONCENTRATION (µg/L)
1	1-Dec-94	*0.25*
2	13-Aug-96	0.43
3	13-May-98	0.53
4	8-Sep-04	*2.5*
5	21-Feb-07	0.77
6	19-Nov-08	0.486
7	17-Oct-13	1.87
8	31-Jan-14	0.751
9	28-May-14	1.41
10	30-Oct-14	2.77
11	21-Jan-15	1.75
12	7-Apr-15	3.02
13	9-Jul-15	3.23
14	2-Oct-15	5.66
15	13-Apr-16	6.5
16	6-Oct-16	9.06
17	17-Nov-17	5.8
18	2-Jul-18	2.8
19	13-Dec-18	16
20	7-Jun-19	7.5
21	20-Dec-19	17
22	25-Jun-20	16
23	3-Dec-20	14
24	3-Jun-21	19
25	2-Dec-21	21
26	9-Jun-22	13
27		
28		
29		
30		
Coefficient of Variation:		1.00
Mann-Kendall Statistic (S):		258
Confidence Factor:		>99.9%
Concentration Trend:		Increasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.
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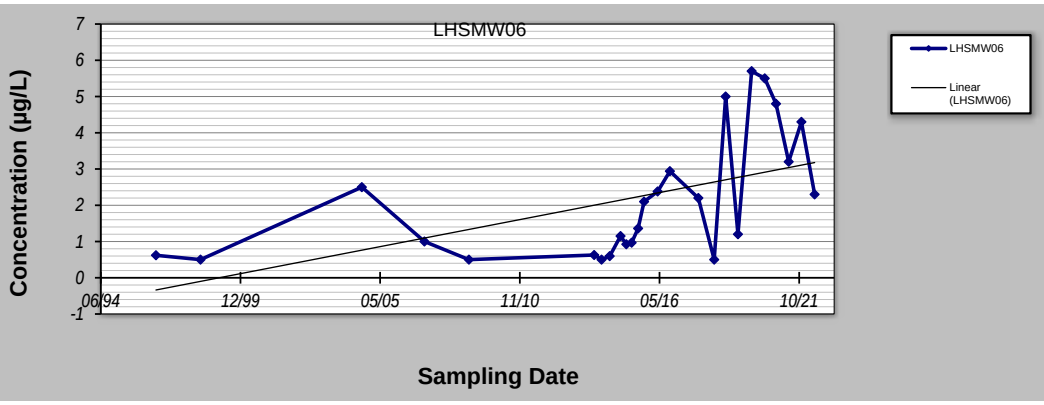
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 3-Aug-21
Facility Name: LHAAP-58
Conducted By: Zachary Beck

Job ID: NWO1312.0150
Constituent: Vinyl Chloride
Concentration Units: µg/L

Sampling Point ID: LHSMW06

Sampling Event	Sampling Date	VINYL CHLORIDE CONCENTRATION (µg/L)
1	13-Aug-96	0.62
2	13-May-98	*0.5*
3	8-Sep-04	*2.5*
4	21-Feb-07	*1*
5	19-Nov-08	*0.5*
6	17-Oct-13	0.627
7	31-Jan-14	0.5
8	28-May-14	0.597
9	30-Oct-14	1.15
10	21-Jan-15	0.924
11	7-Apr-15	0.967
12	9-Jul-15	1.36
13	2-Oct-15	2.1
14	13-Apr-16	2.38
15	6-Oct-16	2.94
16	17-Nov-17	2.2
17	2-Jul-18	*0.5*
18	13-Dec-18	5
19	7-Jun-19	1.2
20	20-Dec-19	5.7
21	25-Jun-20	5.5
22	3-Dec-20	4.8
23	3-Jun-21	3.2
24	2-Dec-21	4.3
25	9-Jun-22	2.3
26		
27		
28		
29		
30		
Coefficient of Variation:		0.80
Mann-Kendall Statistic (S):		156
Confidence Factor:		>99.9%
Concentration Trend:		Increasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.
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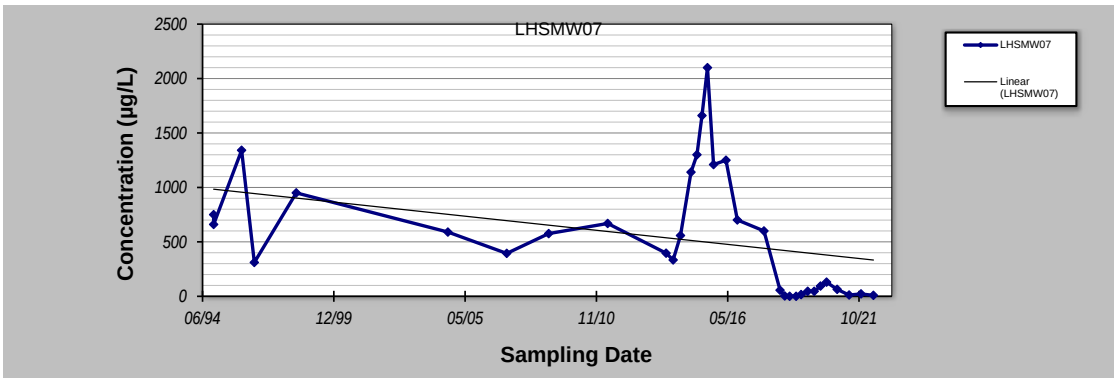
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GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **3-Aug-21**
Facility Name: **LHAAP-58**
Conducted By: **Zachary Beck**
Job ID: **NWO1312.0150**
Constituent: **1,1-Dichloroethene**
Concentration Units: **µg/L**

Sampling Point ID: **LHSMW07**

Sampling Event	Sampling Date	1,1-DICHLOROETHENE CONCENTRATION (µg/L)
1	1-Dec-94	750
2	1-Dec-94	660
3	31-Jan-96	1341
4	12-Aug-96	311
5	13-May-98	950
6	8-Sep-04	590
7	21-Feb-07	394
8	21-Nov-08	576
9	9-May-11	669
10	15-Oct-13	396
11	30-Jan-14	334
12	22-May-14	558
13	29-Oct-14	1140
14	28-Jan-15	1300
15	15-Apr-15	1660
16	7-Jul-15	2100
17	8-Oct-15	1210
18	14-Apr-16	1250
19	4-Oct-16	701
20	14-Nov-17	600
21	17-Jul-18	56
22	26-Sep-18	3.1
23	10-Dec-18	*0.25*
24	19-Mar-19	*0.25*
25	3-Jun-19	16
26	11-Sep-19	46
27	19-Dec-19	46
28	24-Mar-20	94
29	24-Jun-20	130
30	3-Dec-20	64
31	3-Jun-21	12
32	1-Dec-21	22
33	8-Jun-22	8.8
34		
35		
Coefficient of Variation:		**1.02**
Mann-Kendall Statistic (S):		**-210**
Confidence Factor:		**100.0%**
Concentration Trend:		Decreasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.
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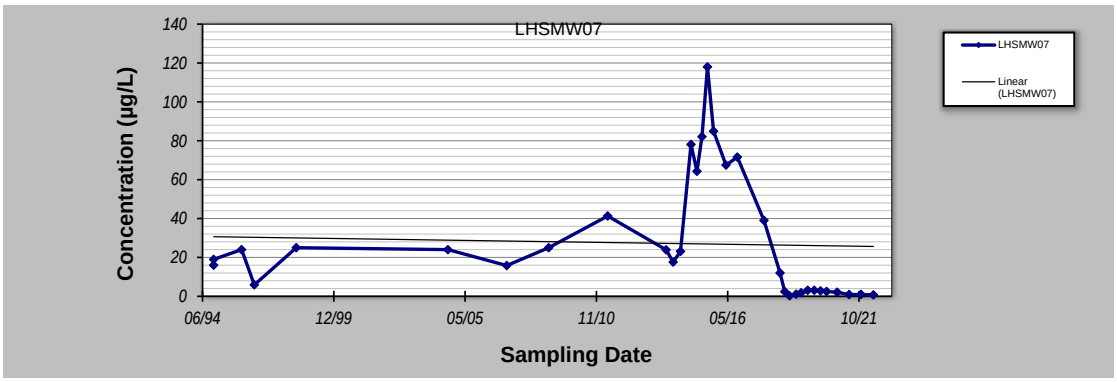
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **3-Aug-21**
Facility Name: **LHAAP-58**
Conducted By: **Zachary Beck**

Job ID: **NWO1312.0150**
Constituent: **Trichloroethene**
Concentration Units: **µg/L**

Sampling Point ID: **LHSMW07**

Sampling Event	Sampling Date	TRICHLOROETHENE CONCENTRATION (µg/L)
1	1-Dec-94	16
2	1-Dec-94	19
3	31-Jan-96	24
4	12-Aug-96	5.9
5	13-May-98	25
6	8-Sep-04	24
7	21-Feb-07	15.8
8	21-Nov-08	25
9	9-May-11	41.3
10	15-Oct-13	23.9
11	30-Jan-14	17.6
12	22-May-14	23.1
13	29-Oct-14	78.1
14	28-Jan-15	64.3
15	15-Apr-15	82.1
16	7-Jul-15	118
17	8-Oct-15	84.9
18	14-Apr-16	67.5
19	4-Oct-16	71.6
20	14-Nov-17	39
21	17-Jul-18	12
22	26-Sep-18	2.4
23	10-Dec-18	*0.25*
24	19-Mar-19	1.1
25	3-Jun-19	1.8
26	11-Sep-19	3.1
27	19-Dec-19	3.1
28	24-Mar-20	2.8
29	24-Jun-20	2.5
30	3-Dec-20	2.1
31	3-Jun-21	0.91
32	1-Dec-21	0.97
33	8-Jun-22	0.71
34		
35		
Coefficient of Variation:		**1.15**
Mann-Kendall Statistic (S):		**-185**
Confidence Factor:		**99.8%**
Concentration Trend:		Decreasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.
4 *ND values are shown in red italics as 1/2 the limit of detection.*

DISCLAIMER: The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of the information contained herein, and no such party shall be liable for any direct, indirect, consequential, incidental or other damages resulting from the use of this product or the information contained herein. Information in this publication is subject to change without notice. GSI Environmental Inc., disclaims any responsibility or obligation to update the information contained herein.

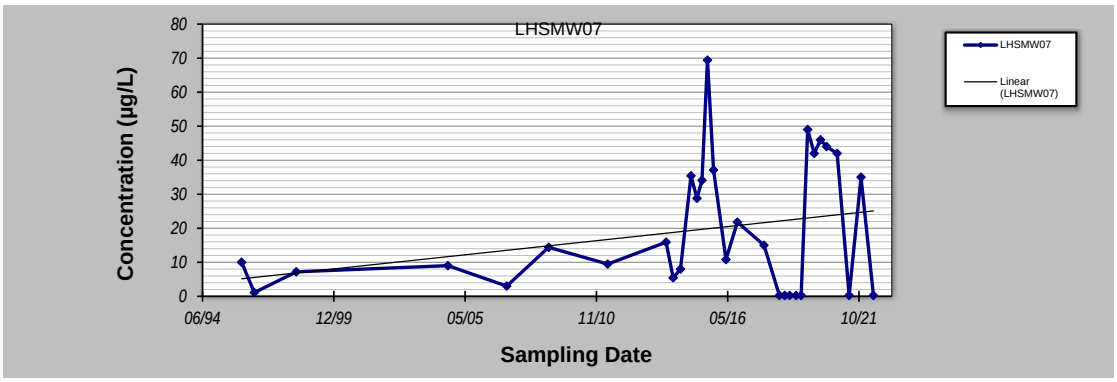
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **3-Aug-21**
Facility Name: **LHAAP-58**
Conducted By: **Zachary Beck**

Job ID: **NWO1312.0150**
Constituent: **Vinyl Chloride**
Concentration Units: **µg/L**

Sampling Point ID: **LHSMW07**

Sampling Event	Sampling Date	VINYL CHLORIDE CONCENTRATION (µg/L)
1	31-Jan-96	10
2	12-Aug-96	1.1
3	13-May-98	7.2
4	8-Sep-04	9
5	21-Feb-07	3
6	21-Nov-08	14.4
7	9-May-11	9.47
8	15-Oct-13	15.9
9	30-Jan-14	5.43
10	22-May-14	7.98
11	29-Oct-14	35.4
12	28-Jan-15	28.8
13	15-Apr-15	34.1
14	7-Jul-15	69.4
15	8-Oct-15	37.1
16	14-Apr-16	10.8
17	4-Oct-16	21.8
18	14-Nov-17	15
19	7-Jul-18	*0.25*
20	26-Sep-18	*0.25*
21	10-Dec-18	*0.25*
22	19-Mar-19	*0.25*
23	3-Jun-19	*0.25*
24	11-Sep-19	49
25	19-Dec-19	42
26	24-Mar-20	46
27	24-Jun-20	44
28	3-Dec-20	42
29	3-Jun-21	*0.25*
30	1-Dec-21	35
31	8-Jun-22	*0.25*
32		
33		
34		
35		
Coefficient of Variation:		**0.99**
Mann-Kendall Statistic (S):		**47**
Confidence Factor:		**78.1%**
Concentration Trend:		No Trend



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.
4 *ND values are shown in red italics as 1/2 the limit of detection.*

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DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
US ARMY ENVIRONMENTAL COMMAND
2455 REYNOLDS ROAD
JOINT BASE SAN ANTONIO FORT SAM HOUSTON, TX 78234-7588

March 17, 2023

SUBJECT: Draft Final Second Annual Remedial Action Operation Report, LHAAP-16 Landfill, Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas, March 2023

Mr. Brian Follin
U.S. Environmental Protection Agency
1201 Elm Street, Suite 500
Dallas, TX 75270-2002

Dear Mr. Follin,

An electronic copy of the subject document has been added to the project portal's "Documents" folder at the following address for your review: (https://docs.cbifederalservices.com/sites/501032/regulators/Shared%20Documents/Forms/AllItems.aspx). An electronic copy of this letter and download instructions for the electronic file have been sent via email. The document includes revisions based upon the Environmental Protection Agency's (EPA) comments on the draft version received on November 28, 2022, and the Texas Commission on Environmental Quality's (TCEQ) comments received on Nov. 10, 2022. Tables of responses to the EPA and TCEQ comments on the draft version are included with this draft final document. In accordance with the Federal Facility Agreement, this draft final will be considered final after 30 days without further comment.

The document was prepared by the Bhate Environmental Associates, Inc., (Bhate) team, on behalf of the Army as part of Bhate's performance-based remediation contract for the facility. Please include Kim Nemmers, Bhate's Project Manager, on any communications related to the project.

The point of contact for this action is the undersigned. I may be contacted at (726) 999-0505, or by email at lena.j.sierocinski.civ@army.mil.

Sincerely,

Lena Sierocinski

Lena Sierocinski
LHAAP Environmental Support Manager
U.S. Army Environmental Command

cc:
A. Palmie, TCEQ, Austin, TX
E. Duerkop, USFWS, Caddo Lake NWR, TX (1 hard copy and 1 CD)
C. Montoya USACE, Tulsa District, OK
A. Williams, USACE, Tulsa District, OK
M. Bowlby, USAEC, San Antonio, TX
K. Nemmers, Bhate, Lakewood, CO
P. Srivastav, APTIM, Houston, TX

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US ARMY INSTALLATION MANAGEMENT COMMAND
US ARMY ENVIRONMENTAL COMMAND
2455 REYNOLDS ROAD
JOINT BASE SAN ANTONIO FORT SAM HOUSTON, TX 78234-7588

March 17, 2023

SUBJECT: Draft Final Second Annual Remedial Action Operation Report, LHAAP-16 Landfill, Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas, March 2023

Ms. April Palmie
Texas Commission on Environmental Quality
Superfund Section, MC-136
12100 Park 35 Circle, Bldg D
Austin, TX 78753

Dear Ms. Palmie,

An electronic copy of the subject document has been added to the project portal's "Documents" folder at the following address for your review: (https://docs.cbifederalservices.com/sites/501032/regulators/Shared%20Documents/Forms/AllItems.aspx). An electronic copy of this letter and download instructions for the electronic file have been sent via email. The document includes revisions based upon the Environmental Protection Agency's (EPA) comments on the draft version received on November 28, 2022, and the Texas Commission on Environmental Quality's (TCEQ) comments received on Nov. 10, 2022. Tables of responses to the EPA and TCEQ comments on the draft version are included with this draft final document. In accordance with the Federal Facility Agreement, this draft final will be considered final after 30 days without further comment.

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The point of contact for this action is the undersigned. I may be contacted at (726) 999-0505, or by email at lena.j.sierocinski.civ@army.mil.

Sincerely,

Lena Sierocinski

Lena Sierocinski
LHAAP Environmental Support Manager
U.S. Army Environmental Command

cc:
B. Follin, USEPA Region 6, Dallas, TX
E. Duerkop, USFWS, Caddo Lake NWR, TX (1 hard copy and 1 CD)
C. Montoya USACE, Tulsa District, OK
A. Williams, USACE, Tulsa District, OK
M. Bowlby, USAEC, San Antonio, TX
K. Nemmers, Bhate, Lakewood, CO
P. Srivastav, APTIM, Houston, TX

Response to Comments on
Draft Second Annual Remedial Action Operation Report, LHAAP-16

Document Date: October 28, 2022
Comment Date: November 28, 2022

Reviewers: Brian Follin - USEPA
Respondent: Lena Sierocinski - Army

1. Respondent Concurs (C), Does Not Concur (D), Takes Exception (E), or Delete (X)
2. Commenter Agrees (A) with response, or Does Not Agree (D) with response

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
1	Section 1.3 Conceptual Site Model, page 1-5, 2nd complete paragraph	It would be helpful to move the 3rd to last sentence in paragraph beginning with "**Figure 1-4** and **Figure 1-5** show the extent of the TCE …" to earlier in the paragraph (new 3rd sentence) so that the reader knows where to find this information before it is discussed/cited.	C	Text will be revised as suggested.	
2	Section 1.3 Conceptual Site Model, page 1-5, 2nd complete paragraph	The 4th sentence in the paragraph indicates TCE was as much as 21,000 micrograms per liter (µg/L) in October 2018 at well 16WW35; however, fig. 1-5 shows 13,000 µg/L. Need to verify which number is correct. If both values are correct, it is unclear why lower value was plotted instead of the higher value. It seems more appropriate to plot the highest values from the pre-remedy sampling results on figs. 1-4 and 1-5.	C	There were two rounds of pre-remedy sampling conducted (October 2018 and September 2019) due to the prolonged power outage that caused shut down of the groundwater extraction system prior to the initiation of the remedy. The text correctly describes the maximum concentration detected during the pre-remedy sampling (which included both sampling events), while the values plotted on Figures 1-4 and 1-5 represent the concentrations at each location closest in time to the initiation of the remedy (not all locations were resampled in 2019), used to depict the baseline plume. The following sentence will be added following the sentence calling out Figures 1-4 and 1-5 to explain the use of the 2018 and 2019 data: "The concentrations and plume contours shown on **Figure 1-4** and **Figure 1-5** are based on the 2019 data, except in cases where the well was not	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
				sampled in 2019, in which case the 2018 data was used." The following text will be added to the end of the sentence in question: "…and 13,000 µg/L in September 2019" No changes will be made to the figures.	
3	Section 1.3 Conceptual Site Model, page 1-5, 2nd complete paragraph, 2nd to last and last sentence	It is unclear what is meant by "… and the lack of a saturated zone correlating to the shallow zone in wells 16WW57 and 16WW58 during their installation" in the 2nd to last sentence and "did not include a saturated zone at depths that would correlate to the shallow zone on the west side of the Harrison Bayou" in the last sentence. Please provide additional explanation.	C	The text at the end of the 2nd to last sentence of the paragraph will be deleted. Further, the last sentence of the paragraph will be deleted and replaced with the following sentence: "During drilling of 16WW57 and 16WW58 to the east of Harrison Bayou, coarse grained strata were encountered at shallow depths, but there was no indication of saturated conditions at depths that would be consistent with the shallow groundwater zone found to the west of the Bayou."	
4	Section 1.3 Conceptual Site Model, page 1-5, last sentence on page	It would be helpful to show these three surface-water sampling locations on fig. 1-3 and cite the fig. in the sentence.	C	Figure 1-3 will be revised to include the surface water locations and a reference to the figure will be added to the text where the locations are discussed.	
5	Fig. 1-3 and other figs. throughout report	Terminology discrepancy: "Bayou Biobarrier" is used throughout the text, but fig. 1-3 and other figs. throughout the report use "Biobarrier Bayou."	C	Figures 1-3, 1-4, 1-5, 2-1, 2-2, 2-3, 2-4, 2-5, 2-30, 2-31, 3-1, and 3-2 will be revised to change "Biobarrier Bayou" to "Bayou Biobarrier".	
6	Section 2.2.1 Groundwater Elevations and Flow Direction	Biobarriers are missing on figs. 2-6 to 2-9 It would be helpful to show them on these figs. so reader can examine them in relation to groundwater elevation contours.	E	The biobarriers and shallow mid-plume treatment areas are present only in the shallow groundwater zone and Figures 2-6 through 2-9 depict the intermediate zone groundwater elevation contours. The following sentence will be added as the 2nd sentence in the last paragraph of Section 2.2.1: " Note that the biobarriers and the shallow mid-plume treatment areas were confined to the shallow groundwater zone; therefore, their	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
				locations are not shown on the intermediate groundwater zone maps".	
7	Section 2.2.2 Groundwater Analytical Results, Landfill Biobarrier #1, 1st paragraph, page 2-5	It would be helpful to move the last sentence in paragraph citing figs. 2-11 and 2-12 to earlier in the paragraph (new 3rd sentence) so that the reader knows where to find this information before it is discussed/cited in this paragraph.	C	The text will be revised as suggested.	
8	Fig. 2-13	The "J" qualifier is not defined in the explanation/footnotes.	C	The J value will be defined as "Concentration shown is estimated" as a qualifier in Note 2.	
9	Section 2.2.2 Groundwater Analytical Results, Landfill Biobarrier #2, 2nd paragraph, page 2-6	It would be helpful to move the last sentence in paragraph citing figs. 2-14 and 2-15 to earlier in the paragraph so that the reader knows where to find this information before it is discussed/cited in this paragraph.	C	The referenced sentence has been moved up to the 4th sentence in the paragraph.	
10	Section 2.2.2 Groundwater Analytical Results, Mid-Plume Area in the Shallow Groundwater Zone, 2nd paragraph, page 2-9	It would be helpful to move the last sentence in paragraph citing figs. 2-24 and 2-26 to earlier in the paragraph so that the reader knows where to find this information before it is discussed/cited in this paragraph. Note: this type of comment will not be made anymore. Should always introduce this type of sentence earlier in paragraph so reader doesn't struggle trying to find the location of the information as they read through a given paragraph/report section for the 1st time.	C	Text throughout Section 2.2.2 will be revised to bring the reference to the trend charts for each area earlier in the paragraph.	
11	Section 2.2.2 Groundwater Analytical Results, Mid-Plume Area in the Shallow Groundwater Zone, 2nd paragraph, 4th sentence, page 2-9	Sentence indicates TCE concentrations at monitoring well 16WW30 fluctuated during year between 11 and 31 µg/L. Fig. 2-23 shows TCE concentrations ranged from 11 to 32 µg/L during year 2 RAO, with a 1st quarter concentration of 11 µg/L and 4th quarter concentration of 32 µg/L. If intent is to indicate the difference in concentrations between the 1st and 4th quarter sampling events in year 2, this sentence and equivalent "fluctuating concentration" sentences in the report should	C	The sentence will be revied to read: "TCE concentrations at monitoring well 16WW30, located downgradient and outside of the treatment area, fluctuated during Year 2 RA-O between 11 µg/L (April 2021) and 32 µg/L (October 2021) with TCE detected below the MCL in Year 1 Quarter 4 and at 31 µg/L in Year 2 Quarter 4 (January 2022);…"	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
		simply state what the concentrations were in the 1st and 4th quarters, so it is clear that this sentence and equivalent sentences in report are not referring to the minimum and maximum concentrations during year 2, but simply comparing 1st and 4th quarter values.			
12	Section 2.2.2 Groundwater Analytical Results, Mid-Plume Area in the Intermediate Groundwater Zone, 1st paragraph, last sentence, page 2-10.	The 260 µg/L concentration was measured in October 2019, not October 2018 as stated.	C	The concentration referenced was from a sample collected on September 19, 2019. Sentence will be revised to correct the date of the 260 µg/L concentration from October 2018 to September 2019.	
13	2.3 Surface Water Sampling section, 2nd paragraph, 2nd sentence, page 2-12.	Need to indicate turbidity also was measured.	C	Turbidity will be added to the list of field parameters that were measured.	
14	2.3 Surface Water Sampling section, 2nd paragraph, last sentence, page 2-12.	Last sentence incorrectly indicates thallium was not detected at any of the surface water sampling sites. Per table 2-12, thallium was detected at site SW01 during the year 2 1st quarter (4/19/21) sampling event at a very low estimated ("J") concentration of 0.00117 J µg/L. Table 2-12 also indicates thallium also was detected during year 1 sampling at the site at similar low (estimated, or "J"-qualified) concentrations on 10/26/20 and 4/19/21.	C	Sentence will be revised to state: "Thallium was detected in the sample from 16SW01, collected during the April 2021 sampling event, at a concentration of 0.00117 mg/L and was not detected in the remaining samples."	
15	3.1 Change in COC concentration section, 1st paragraph, 1st sentence, page 3-1.	Believe authors mistakenly used "a**b**sorption" at end of 1st sentence instead of "a**d**sorption."	C	The text will be revised to read "sorption" to be consistent with usage elsewhere in the document.	
16	3.1.1.1 Landfill Biobarrier #1 section, Within	This sentence and subsequent sentences throughout the report use the term "ethene" for this compound/gas, but all the tables in the	C	Text will be revised to include a callout of ethylene in parentheses at first use as suggested.	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
	Treatment Area subsection, 1st paragraph, 2nd to last sentence, page 3-2.	report use the term "ethylene." Consequently, consider adding a parenthetical after "ethene" one time at this report location to equate the synonymous terms for readers unfamiliar with the differing terminology for the same gas (i.e., "Ethane and ethene (ethylene) are the two end products…"). Alternatively, change all occurrences of "ethylene" in the tables to "ethene."			
17	Page 11 of table 2-3.	One of two columns for the results of well 16WW42 sampling on 3/10/20 should be identified as the replicate sample (FD) because both are currently identified as environmental samples (REG).	C	The second column is the field duplicate sample and the REG will be revised to FD.	
18	3.1.1.1 Landfill Biobarrier #1 section, Outside Treatment Area subsection, 3rd paragraph, 1st sentence, page 3-2.	Sentence indicates TCE in well 16WW42 "showed a reduction in TCE concentration to below the MCL in March 2020," but table 2-3 indicates no samples were collected/analyzed in March 2020 (identified with "NA" for "not analyzed" in table).	C	The volatile and perchlorate data for the March 10, 2020 sample from 16WW42 were inadvertently omitted from Table 2-3. The table will be updated to include the volatiles and perchlorate results for the REG and FD samples from March 10, 2020.	
19	3.1.1.1 Landfill Biobarrier #1 section, Outside Treatment Area subsection, 3rd paragraph, 2nd sentence, page 3-2.	Sentence indicates TCE concentrations in well 16WW42 were below the detection limit in the 1st two quarters of Year 2, RA-O, but table 2-3 indicates TCE was detected at 0.97 J µg/L in 4/21 (1st quarter, year 2) and at 1.1 µg/L in 7/21 (2nd quarter, year 2). Believe the intent of sentence was to indicate TCE concentrations were below the MCL during the 1st two quarters of year 2 sampling?	C	The sentence (in renumbered Section 3.1.1) will be revised to state that the referenced concentrations were below the MCL.	
20	3.1.1.2 Landfill Biobarrier #2 section, Within Treatment Area subsection, 2nd paragraph, last sentence, page 3-4.	Sentence indicates perchlorate was not detected in well 16IW03 during Years 1 and 2 of the RA-O, but table 2-3 indicates perchlorate was detected at 1.85 µg/L in 7/20 (year 1, 2nd quarter), 0.0876 J µg/L in 10/20 (year 1, 3rd quarter), and 0.754 J µg/L in 4/21 (year 2, 1st quarter).	C	The sentence (in renumbered Section 3.1.2) will be revised to indicate that perchlorate has not been detected above the PCL in years 1 or 2.	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
21	3.1.1.2 Landfill Biobarrier #2 section, Outside Treatment Area subsection, 1st paragraph, last sentence, page 3-4.	Sentence begins with "At both wells, elevated levels have been observed…", but it does not indicate which compounds are being referred to in this part of the sentence. Revise sentence to clarify.	C	The sentence (in renumbered Section 3.1.2) will be revised to remove the introductory statement in question. The sentence now reads as follows: "TCE was detected in wells 16PM03 and 16PM02 at 6,800 and 31,000 µg/L, respectively, in January 2022."	
22	3.1.1.2 Landfill Biobarrier #2 section, Outside Treatment Area subsection, 2nd paragraph, 1st sentence, page 3-4.	Sentence indicates perchlorate was not detected in well 16PM06, but table 2-4 indicates perchlorate was detected at a low estimated concentration of 0.0474 J µg/L in 7/21 (year 2, 2nd quarter).	C	The sentence (in renumbered Section 3.1.2) will be revised to clarify that perchlorate "has not been detected above the PCL".	
23	3.1.1.2 Landfill Biobarrier #2 section, Outside Treatment Area subsection, 2nd paragraph, 3rd sentence, page 3-4.	Sentence indicates the degradation products DCE and VC were decreasing over the same period — should also note here that cis-1,2-DCE was decreasing as well.	C	The sentence (in renumbered Section 3.1.2) will be revised to refer to cis-1,2-DCE instead of DCE.	
24	3.1.1.2 Landfill Biobarrier #2 section, Outside Treatment Area subsection, 2nd paragraph, last sentence, page 3-4.	Sentence indicates "localized groundwater flow conditions may be influencing COC concentrations" but an explanation as to how/why groundwater flow is "influencing" the concentrations is not provided. Also note that "affecting" would probably be a preferable word selection than "influencing."	C/E	The sentence (in renumbered Section 3.1.2) will be revised to state: "The trend graph on Figure 2-14 for 16PM06 suggests that groundwater elevation fluctuations may be influencing COC concentrations." Regarding the 2nd part of the comment, we believe that "influencing" is a better word choice than "affecting" because it allows for the possibility that the impact of the fluctuations may be indirect in nature rather than directly causative.	
25	3.1.1.2 Landfill Biobarrier #2 section, Outside Treatment Area subsection, 3rd	Unclear what is meant by "The concentrations of the daughter products VC and ethene were also observed…". Perhaps the authors meant to indicate "The daughter products VC and ethene also were detected…"? Revise sentence for clarity.	C	Sentence (in renumbered Section 3.1.2) will be revised to read: "TCE daughter products VC and ethene were also detected, and their concentration trends were	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
	paragraph, 3rd sentence, page 3-5.			similar to the TCE and cis-1,2-DCE concentration trends (**Table 2-4**)."	
26	3.1.1.2 Landfill Biobarrier #2 section, Summary subsection, 1st sentence, page 3-5.	The comma between "cis" and "1,2-DCE" in "cis**,**1,2-DCE" should be a hyphen to match usage elsewhere in report (i.e., should be "cis**-**1,2-DCE").	C	Text (in renumbered Section 3.1.2) will be revised as suggested.	
27	3.1.1.3 Landfill Biobarrier #3 section, Outside Treatment Area subsection, 1st paragraph, 3rd sentence, page 3-6.	Need to indicate the sentence is describing results for 16RW07 — one way to do this is to add "at 16RW07" between "were detected" and "above their respective MCL;".	C	The sentence (in renumbered Section 3.1.3) will be revised to read: "During the Year 1 RA-O, TCE, 1,1-DCE, cis-1,2-DCE, and VC were detected above their respective MCLs at 16RW07; however…"	
28	3.1.1.3 Landfill Biobarrier #3 section, Outside Treatment Area subsection, 1st paragraph, 3rd sentence, page 3-6.	Sentence indicates 1, 1-TCA was detected in RW07, but table 2-5 indicates the compound was not detected in either year 1 or year 2 monitoring.	C	The 1,1-TCA should have been 1,1-DCE. See the response to Comment #27 above for the revised text.	
29	3.1.1.3 Landfill Biobarrier #3 section, Outside Treatment Area subsection, 1st paragraph, 4th sentence, page 3-6.	Sentence indicates "elevated concentrations…will continue to migrate into the biobarrier…". Suggest rephrasing sentence because "concentrations" cannot "migrate"; however, groundwater with "elevated concentrations" of one or more constituents can flow/migrate. In addition, the sentence should identify the constituents being referred to (in this case, presumably groundwater with elevated concentrations of TCE and VC above MCLs").	C	The sentence (in renumbered Section 3.1.3) will be revised to read: "The groundwater containing elevated TCE and VC concentrations upgradient will continue to migrate into the biobarrier as designed and the compounds are expected to be completely reduced as indicated by the decreases observed at 16IW10."	
30	3.1.1.3 Landfill Biobarrier #3 section, Outside Treatment Area subsection, 3rd	Sentence indicates ethene was detected during each year 2 sampling event, including January 2022. However, methane also was detected in all four year 2 sampling events, and eth**a**ne also was detected in the year 2 4th quarter sampling event.	C	Noted. The discussion in this section is primarily regarding the COCs and primary degradation products. While ethane is a minor product from the degradation chain, ethene is typically considered the harmless endpoint in discussions of TCE degradation. The presence of methane is	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
	paragraph, 3rd sentence, page 3-6.			discussed as part of the 2nd line of evidence in Section 3.2.	
31	3.1.1.4 Bayou Biobarrier section, Within Treatment Area subsection, 1st paragraph, 1st sentence, page 3-7.	At the beginning of sentence, the word "well" should be pluralized to "wells" (i.e., "Two wells are located…").	C	Text (in renumbered Section 3.1.4) will be revised as suggested.	
32	3.1.1.4 Bayou Biobarrier section, Within Treatment Area subsection, 1st paragraph, 4th sentence, page 3-7.	Sentence beginning with "Ethene was detected…". Sentence indicates, ethene was detected at 16IW20, at concentrations ranging between 11.1 J µg/L (01/22) to 20.2 J µg/L (4/21) [beginning and end of year 2 monitoring], but sentence is constructed in a manner that seems to indicate the writer intended to refer to the highest and lowest concentrations for the year 2 monitoring. If range was intended, the sentence should be modified accordingly to reflect the values in table 2-6, which indicate concentrations ranged from a low of 6.77 J µg/L (10/21) to a high of 20.2 J µg/L (4/21) in year 2.	C	Text will be revised to read: "Ethene was detected at 16IW20 during the Year 2 RA-O at estimated concentrations between 6.77 J µg/L and 20.2 J µg/L,…"	
33	3.1.1.4 Bayou Biobarrier section, Outside Treatment Area subsection, 1st paragraph, 2nd sentence, page 3-7.	Sentence beginning with "during the year 2…". Would be helpful to indicate this sentence is referring to wells in the shallow zone. It also would be helpful to add the word "zone" between "intermediate" and "groundwater well" in previous sentence ("[intermediate zone groundwater well"]).	C	The referenced text (in renumbered Section 3.1.4) will be revised to read: "… and two upgradient wells (16WW22 and 16WW41 [intermediate zone well]) are sampled. During the Year 2 RA-O, upgradient shallow zone TCE concentrations ranged from…"	
34	3.1.1.4 Bayou Biobarrier section, Outside Treatment Area subsection, 1st paragraph, 3rd sentence, page 3-7.	Sentence beginning with "At intermediate zone…". A "J" is missing after the estimated value of 14.3.	C	Text (in renumbered Section 3.1.4) will be revised to include the J qualifier.	
35	3.1.1.4 Bayou Biobarrier section, Outside Treatment Area subsection,	Sentence beginning with "However, after October 2021…". Sentence indicates concentrations in well 16WW40 declined after October 2021, but examination of table 2-6	C	Text (in renumbered Section 3.1.4) will be revised to read:	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
	2nd paragraph, 2nd to last sentence, page 3-8, 2nd to last sentence in paragraph	indicates concentrations peaked in 7/21, so "October" should be replaced with "July" (i.e., "However, after July 2021, TCE…").		"However, after July 2021, TCE levels began to decrease and, by January 2022, TCE was detected at 540 µg/L, as shown on Figure 2-22; below the baseline level of 740 µg/L observed in September 2019, as shown on Figure 1-4 and Table 2-6."	
36	3.1.1.4 Bayou Biobarrier section, Outside Treatment Area subsection, 2nd paragraph, 2nd to last sentence, page 3-8, 2nd to last sentence in paragraph	Sentence beginning with "However, after October 2021…". Sentence references 660 TCE concentration in October 2018 and cites fig. 2-22. Fig. 2-22 does not show information from 2018, so citation should be for table 2-6 **and** fig. 2-22 or only table 2-6.	C	Text (in renumbered Section 3.1.4) will be revised to place the reference to Figure 2-22 after the statement about the January 2022 concentration and prior to the mention of the 2019 baseline. Reference to Figure 1-4 and Table 2-6 referenced for the 2019 baseline concentrations. See the response to Comment #35 above for the revised text.	
37	3.1.1.4 Bayou Biobarrier section, Outside Treatment Area subsection, 2nd paragraph, page 3-8.	This paragraph discusses exceedances of the MCLs for 16 WW40, but does not mention exceedances of the 1, 2-dichloroethane MCL in all four year 2 sampling events, and exceedances of the cis-1, 2 dichloroethane MCL in the first three year 2 sampling events.	C/E	Note that the comment incorrectly reverses 1,2-DCA and cis-1,2-DCE in describing when the MCL was exceeded. The MCL exceedances for 1,2-DCA are already discussed in the last sentence of the paragraph. The following sentence will be added as the second to last sentence (in renumbered Section 3.1.4) to discuss the cis-1,2-DCE MCL exceedances: "The cis-1,2-DCE concentrations exceeded the MCL in all four Year 2 RA-O sampling events, with the concentration declining from 210 µg/L in April 2021 to 120 µg/L in January 2022 (Table 2-6)."	
38	3.1.1.4 Bayou Biobarrier section, Summary subsection, 2nd to last sentence, page 3-9.	Sentence that begins with "As mentioned...". The words "indicate groundwater" should be inserted between "Bayou Biobarrier" and "is flowing" because the sentence currently indicates that a groundwater gradient is flowing, rather than groundwater. Thus, this part of the sentence should be "…the groundwater gradient near the southern end of the Bayou Biobarrier indicates groundwater is flowing to the east-southeast…". Also would be more appropriate to replace "groundwater gradient" with	C	Text (in renumbered Section 3.1.4) will be revised to add "indicates that groundwater" where suggested and to revise "groundwater gradient" to "groundwater hydraulic gradient".	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
		"hydraulic gradient," "groundwater hydraulic gradient," or "horizontal hydraulic gradient."			
39	3.1.1.5 Mid-Plume Area (Shallow) section, 2nd sentence, page 3-9.	The word trend" should be pluralized in the 2nd sentence (i.e., "Contaminant trend**s** for monitoring wells…").	C	Text (in renumbered Section 3.1.5) will be revised as suggested.	
40	3.1.1.5 Mid-Plume Area (Shallow) section, Outside Treatment Area subsection, 1st paragraph, 1st sentence, page 3-10.	The phrase "concentrations were observed" is somewhat nonsensical. Thus, suggest replacing "concentrations were observed" with "were detected" (i.e., "At downgradient well 16WW30, TCE and cis-1,2-DCE were detected; however,..") Or, alternatively, "TCE and cis-1,2-DCE were detected at downgradient well 16WW30; however,...".	C	The text (in renumbered Section 3.1.5) will be modified as suggested by the reviewer. Text will be revised to read: "TCE and cis-1,2-DCE concentrations were detected at downgradient well 16WW30; however, …"	
41	3.1.1.5 Mid-Plume Area (Shallow) section, Outside Treatment Area subsection, 2nd paragraph, 2nd to last sentence, page 3-10.	Sentence indicates "VC and eth**a**ne were also observed at their highest levels in October 2021…". However, table 2-7 and the next sentence indicate "ethane" should be "ethene" in this sentence.	C	Text (in renumbered Section 3.1.5) will be revised from "ethane" to "ethene".	
42	3.1.1.6 Mid-Plume Area (Intermediate) section, introductory (1st) paragraph, 2nd sentence, page 3-11.	The 2nd sentence refers to fig. 2-28 as a contaminant trend plot for well 16EW08, but figure is a contaminant trend plot for well 16WW51.	C	The text (in renumbered Section 3.1.6) will be revised to correctly refer to 16WW51 instead of 16EW08. The reference to Figure 2-28 will be removed in the last sentence of the last paragraph of the "Within Treatment Area" text. The figures #s for the 16WW49 and 16WW51 trend plots (Figures 2-28 and 2-29) will be reversed to reflect the fact that 16WW49 is discussed first in the text.	
43	3.1.1.6 Mid-Plume Area section (Intermediate), Within Treatment Area subsection, 1st paragraph, 5th	A "J" qualifier is missing after "26.1" (i.e., should be "… at elevated levels of 34.2 *µg/L* and 26.1 *J* µg/L in January 2022..."). Note that "µg/L" has to be added after 34.2 because it is not a "J-qualified" value like the 26.1 value.	C	Text (in renumbered Section 3.1.6) will be revised to add the J qualifier and "µg/L" as suggested, and to add ", respectively" following the 2nd concentration.	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
	sentence, page 3-11.				
44	3.1.1.6 Mid-Plume Area (Intermediate) section, Within Treatment Area subsection, 2nd paragraph, 1st sentence, page 3-11.	First sentence is awkwardly constructed. Perhaps replace with something such as the following: "TCE was detected only once at well 16EW06 during year 2, at a concentration of 3,000 µg/L in October 2021."	C	Text (in renumbered Section 3.1.6) will be revised to read: "TCE was detected at well 16EW06 only once during the Year 2 RA-O, at a concentration of 3,000 µg/L in October 2021."	
45	3.1.1.6 Mid-Plume Area section, Within Treatment Area subsection, 2nd paragraph, 1st complete sentence at top of page 3-12.	The sentence refers to fig. 2-28 as a contaminant trend plot for well 16EW08, but figure is a contaminant trend plot for well 16WW51.	C	See the response to comment #42. The sentence will be deleted.	
46	3.1.1.6 Mid-Plume Area section, Outside Treatment Area subsection, 1st paragraph, last sentence, page 3-12.	The word "in" is extraneous between "below the MCL" and "during the first year of RA-O."	C	Text (in renumbered Section 3.1.6) will be revised to remove "in" as suggested.	
47	3.1.2 Mann-Kendall Analysis section, 1st paragraph, page 3-13, and Appendix E.	Comments about approach to trend analysis using the Mann-Kendall test. The Mann-Kendall test can be used to determine trends for datasets with censored data values, but its use is recommended only for censored water-quality datasets with one censoring level and minimal censoring (less than about 10% of data values in a given data set) (Helsel, 2012; Helsel and others, 2020). Thus, use/substitution of one-half the reporting level (or any value below the reporting level) for a censored data value generally is recommended only if all the censored values in a given data set to be evaluated were censored to the same reporting	C/E	We concur that statistical trend analyses are inappropriate for use on data sets featuring high percentages of nondetects (NDs) since the actual concentrations (if any) of the nondetect compounds are unknown and the trend results have no meaning. There are many trend evaluations that were shown on the Appendix E forms that are not relevant due to the concentrations of the contaminant being below the MCL/PCL throughout the Year 2 RA-O. These made up the bulk of the evaluations that included multiple consecutive NDs and many of the instances of varying reporting limits for NDs.	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
		level by the analyzing laboratory (Helsel, 2012; Helsel and others, 2020). Many of the data sets in this report analyzed for trends using the Mann-Kendall test are multiply censored, and thus, contain more than one censoring level (laboratory reporting level). Substitution of one-half the reporting limit or any other value less than the reporting limit for censored data values is not recommended for multiply censored data sets— for example, see Helsel (2012) for numerous examples of why this is considered a poor approach to analyzing multiply censored data sets. Helsel (2012) presents more appropriate and defensible statistical methods/approaches to evaluating trends for multiply censored data sets, and he explains why substitution is a poor and misleading approach that can lead to incorrect conclusions. These "survival analysis/score test" statistical methods can now be easily applied to multiply censored data sets using the NADA and NADA2 packages in R, so there is no need to use the less than optimal "substitution" methods. References: Helsel, D.R., 2012, Statistics for censored environmental data using Minitab and R: New York, John Wiley & Sons, 344 p.; Helsel, D.R., Hirsch, R.M., Ryberg, K.R., Archfield, S.A., and Gilroy, E.J., 2020, Statistical methods in water resources: U.S. Geological Survey Techniques and Methods, book 4, chapter A3, 458 p. [Also available at https://doi.org/10.3133/tm4a3.].		The trend evaluations of those contaminants will be removed from Appendix E to address this issue. In addition, the Year 3 (June-July 2022) data will be removed from the 19 wells' data sets in which they were incorrectly included, and the Mann-Kendall (MK) tests will be re-run for those data sets. Regarding the overall intent of the comment, the Army believes that the comment overstates the impact of instances of NDs in the LHAAP-16 groundwater data sets. Some of the concerns will be allayed when the unnecessary evaluations are removed as mentioned above. The comment cites only Helsel-authored documents, to the exclusion of actual regulatory guidance, and it overstates the perceived negative impact of substitution when handling NDs. Multiple credible and well cited sources recommend the use of the MK test for trend analysis in data sets such as LHAAP-16's and support the use of ½ reporting limit (½ detection limit [DL]) for ND results when the ND percentage is not high and the NDs' reporting limits are less than the detected concentrations. The nonparametric MK test determines the signs (concentration increases or decreases) between all possible pairs of data points; then sums the signs; and determines the test statistic (S) by subtracting the number of negative differences from the number of positive differences. When a data set is left-censored, the absolute values of the concentration pairs are less important than the signs (up or down) between them. When the test is performed on data sets with low percentages of NDs, and especially when the reporting limits of ND results are below those of the detected concentrations, then the impact of NDs on the overall trend test conclusion is decreased.	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
				There are approaches, such as the ones cited in the comment, that may be designed to reduce uncertainties surrounding the presence of NDs, but they cannot eliminate them. In practical usage, the presence of ND results, estimated (J-qualified) results, acceptable analytical error (that can be in the range of +/- 20 to 25 percent), low sample sizes, and lack of representativeness of sampling all combine to yield an irreducible uncertainty that cannot be eliminated by any statistical method at any investigation site. This applies to all statistical procedures, including the methods/ approaches referred to in the comment, and the industry-standard, U.S. Environmental Protection Agency (USEPA) recommended MK test. The Army notes that the USEPA specifically directs statistical practitioners to "Assign a value of DL/2 to all non-detects" in its MK test instructions (USEPA 2006). As noted in ITRC, 2021, "Hewett and Ganser (2007) indicated that substitution methods are expedient and reasonably accurate, especially when dealing with datasets with small proportions of nondetects…Some investigators (Hornung and Reed 1990; She 1997; Antweiler and Taylor 2008) report the performance of ½ DL as being reasonable." ITRC (2013) recommends "general strategies for handling nondetects" to include "…a rank-based, nonparametric test, such as the Mann-Kendall test." USEPA (2009) indicates that ND substitution is acceptable when a data set contains 10 to 15 percent ND. Per the ProUCL Version 5.2 Technical Guide (USEPA 2022), "For data sets consisting of NDs with varying DLs, one can replace all NDs with half of the lowest DL (DL/2) or by replacing all NDs by a single value lower than the lowest DL. When multiple DLs are present in a data set, the use of substitution methods should be avoided."	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
				Of the LHAAP-16 data sets appropriate for trend analysis, most (82) contain no NDs, one ND (17), or two NDs (3). In most cases where there are multiple NDs, the reporting limits are identical, which minimizes the effects of censored values. Also in most cases, the NDs' substitution values (½ DL) are less than the detected concentrations. Among the LHAAP-16 data sets characterized by more than one ND and different reporting limits for their ND, only four warrant trend analysis because of recent MCL exceedances (i.e., at least one detection above the MCL since July 2021) and sufficient detection frequency (less than 50 percent ND). For three of these four data sets (1,1-DCE at well 16WW55; vinyl chloride at 16IW20 and 16WW55), the NDs' reporting limits are below the detected concentrations. This means that when the ND is compared to one of the detections to determine the sign, the sign will reliably be negative (and vice versa). In other words, incorrect comparisons are not being made between the paired data points, and the test result is not biased, nor is it a "poor approach." When the data sets with no recent MCL exceedances during the Year 2 monitoring period (e.g., 1,1-dichloroethene [DCE] at well 16WW40; 1,2-dichloroethane [DCA] at 16IW20; trichloroethene [TCE] at 16IW09) and those with 50% or more NDs (e.g., vinyl chloride [VC] at 16WW22; 1,2-DCA at 16WW35) are excluded, only a small subset of the remaining data sets contain NDs, and they have the following ND percentages: 16EW02: 1,2-DCA and VC = 9% each 16WW40: VC = 10% 16EW03: VC = 11%	

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				16WW48: VC and perchlorate = 10% each 16IW10: TCE = 13% 16WW13: VC = 10% 16WW16: 1,1-DCE and 1,2-DCA = 10% each 16WW35: Perchlorate = 10% 16WW36: 1,2-DCA = 20% 16WW37: VC = 22% 16WW40: 1,1-DCE and VC = 10% each 16WW41: 1,1-DCE and perchlorate = 10% each 16WW48: VC and perchlorate = 10% each 16WW55: 1,1-DCE, 1,2-DCA, and VC = 30%, 10%, and 20%, respectively. Most of the above-listed ND percentages are low and lie within or below the 10 - 15-percent range mentioned in USEPA (2009). Also of note is that most of these data sets contain only one ND, with a reporting limit that is lower than the detected concentrations. The presence of these low-frequency, low-value NDs does not adversely affect trend test results. Vinyl chloride at 16IW20 was ND in the first three samples (March 2020, July 2020, and October 2020), with identical reporting limits (0.50 microgram per liter [µg/L]). Multiple consecutive (three or more) NDs are problematic for the trend test, and thus the first two NDs will be excluded from the MK analysis (the revised test indicates no trend, which is corroborated by visual inspection of the post-2020 concentration data). Similarly, perchlorate at 16WW37 was ND in the first three samples (October 2018, March 2020, and July 2020), and thus the first two ND will be excluded (the revised test still indicates an increasing trend,	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
				which is corroborated by visual inspection of the concentration data). It is important to note that in addition to the quantitative statistical test, the data are visualized on concentration vs. time graphs. This allows the test results to be placed in the proper context of the actual concentration data. At this point in the sampling program, sufficient data are being evaluated and visualized so that there is little likelihood of overlooking an overall change in concentration over time. With the exceptions noted above (which will be addressed as noted in this response), the LHAAP-16 MK tests were performed in accordance with USEPA (2009) guidance. For the reasons described above, redoing the trend analyses per the comment would not confer an advantage because it would not provide more meaningful results. <u>References Cited in the Response:</u> Antweiler, R. C. and H. E. Taylor, 2008, "Evaluation of Statistical Treatments of Left-Censored Environmental Data using Coincident Uncensored Data Sets: I. Summary Statistics," Environmental Science & Technology, Vol. 42, No. 10, pp. 3732-3738. Hewett, P. and G. H. Ganser, 2007, "A comparison of several methods for analyzing censored data," The Annals of Occupational Hygiene, Vol. 51, No. 7, pp. 611-632. Hornung, R. W. and L. D. Reed, 1990, "Estimation of Average Concentration in the Presence of Nondetectable Values," Applied Occupational and Environmental Hygiene, Vol. 5, No. 1, pp. 46-51. Interstate Technology & Regulatory Council (ITRC), 2021, Soil Background and Risk Assessment, prepared by the Interstate Technology	

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				& Regulatory Council's Soil Background and Risk Team, December. Interstate Technology & Regulatory Council (ITRC), 2013, Groundwater Statistics and Monitoring Compliance: Statistical Tools for the Project Life Cycle, GSMC-1, prepared by the Interstate Technology & Regulatory Council's Groundwater Statistics and Monitoring Compliance Team, December. She, N., 1997, "Analyzing Censored Water Quality Data Using a Non-Parametric Approach," Journal of the American Water Resources Association, Vol. 33, No. 3, pp. 615-624. U.S. Environmental Protection Agency (USEPA), 2022, ProUCL Version 5.2.0 Technical Guide, Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations, Office of Research and Development, June. U.S. Environmental Protection Agency (USEPA), 2009, Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities: Unified Guidance, EPA/530/R-09/007, Office of Resource Conservation and Recovery Program Implementation and Information Division, March. U.S. Environmental Protection Agency (USEPA), 2006, Data Quality Assessment: Statistical Methods for Practitioners, EPA QA/G-9S, EPA/240/B-06/003, Office of Environmental Information, February.	
48	3.1.2.1 Mann-Kendall Analysis section	Throughout section, the word "statistically" is used to denote statistically significant trends. It would be more appropriate to use "significantly."	C	The text (in renumbered Section 3.1.7) will be revised as suggested.	
49	3.1.2.1 Mann-Kendall Analysis section, 1st	The 4th sentence of the paragraph cites table 3-1 as a summary of Mann-Kendall results, but	C	Text (in renumbered Section 3.1.7) will be revised as suggested.	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
	paragraph, page 3-13.	perhaps table 3-2 was what was intended to cite because it summarizes the trends?			
50	3.1.2.1 Mann-Kendall Analysis section, Landfill Biobarrier #1 subsection, 3rd to last sentence in paragraph, page 3-13.	There is an extra dash between "cis-1,2" and "DCE."	C	Text (in renumbered Section 3.1.7.1) will be revised as suggested.	
51	3.1.2.4 Mann-Kendall Analysis section, Bayou Biobarrier Subsection, 1st paragraph, page 3-14.	The 2nd sentence as constructed is a little bit misleading because two of the compounds (1,2-DCA and cis-1,2-DCE) were only detected above the MCL at well 16IW20 in year 1.	C	Text (in renumbered Section 3.1.7.4) will be revised to read: "At 16IW20 within the treatment zone, TCE, cis-1,2-DCE, 1,2-DCA, and VC were above their respective MCLs during Year 1, while TCE and VC were above their respective MCLs during the Year 2 RA-O."	
52	3.1.2.5 Mann-Kendall Analysis section, Mid-Plume Area, Shallow Zone subsection, 1st paragraph, page 3-14.	The 2nd sentence as constructed is a little bit misleading because perchlorate was only detected above the MCL at well 16EW02 in year 1 (3/20).	C	Text (in renumbered Section 3.1.7.5) will be revised to read: "At 16EW02, TCE, cis-1,2-DCE, VC, 1,2 DCA, and 1,1-DCE were above their respective MCLs during the Years 1 and 2 RA-O. Perchlorate was above the PCL during one sampling event (March 2020) in Year 1."	
53	3.1.2.5 Mann-Kendall Analysis section, Mid-Plume Area, Shallow Zone subsection, 2nd paragraph, page 3-15.	The 1st sentence needs revised because 1,2-DCA and 1,1-DCE were not detected above their respective MCLs at well 16EW03 in either year.	C	The first sentence (in renumbered Section 3.1.7.5) will be revised to read: "At 16EW03, TCE, cis-1,2-DCE, and VC were above their MCLs during the Year 1 and Year 2 RA-O sampling events." The last two sentences of the paragraph will be deleted.	
54	3.1.2.6 Mann-Kendall Analysis section, Mid-Plume Area, Intermediate	The word "at" before "TCE" should be changed to the word "for."	C	Text (in renumbered Section 3.1.7.6) will be revised as suggested.	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
	subsection, 1st paragraph, 2nd to last sentence, page 3-15.				
55	3.1.2.6 Mann-Kendall Analysis section, Mid-Plume Area, Intermediate subsection, 1st paragraph, last sentence, page 3-15.	Sentence needs revised to make "decreasing trends" singular and add "or no trend" after "indicates that decreasing trends" because cis-1, 2-DCE concentrations are significantly decreasing and TCE concentrations have no trend at well 16WW49, and both compounds are significantly increasing at well 16WW51 (per table 3-2).	C	Text (in renumbered Section 3.1.7.6) will be revised to read: "The Mann-Kendall analysis for this area indicates that a decreasing trend or no trend has been observed in the northern downgradient area at 16WW49, and increasing trends are occurring in the southern downgradient area at 16WW51."	
56	3.1.3 Predictive Modeling section, 1st paragraph, 3rd sentence, page 3-15.	Believe it would be better to replace "may be skewed" with "may be affected" because use of "skewed" in statistics generally is used to describe the distributional characteristics of a given data set.	C	The word "skewed" will be replaced with "influenced" (in renumbered Section 3.1.8)	
57	Figs. 3-1 and 3-2.	Should add well numbers and enlarge the text on figs. (e.g., biobarrier identifiers).	C	The figures will be revised as suggested.	
58	3.1.4 Plume Stability section, 1st paragraph, page 3-16.	In the 1st paragraph, it would be helpful to indicate that, in addition to figs. 3-1 and 3-2, table 3-1 provides much of the supporting information discussed throughout this report section.	C	The following sentence (in renumbered Section 3.1.9) will be added as the second sentence in the paragraph to refer readers to Table 3-1: "Table 3-1 provides a concise summary of the historical concentrations of TCE and perchlorate."	
59	3.1.4 Plume Stability section, figs. 3-1 and 3-2.	The discussion throughout the section would be greatly helped by having the well numbers added to the 3 subparts (different timeframes) of each figure. Without these well numbers, the reader has to consult earlier figs. in relation to these figs. in order to easily follow the discussion.	C	The figures will be revised as suggested.	
60	3.1.4 Plume Stability section.	Reference is made to plume "intensity" in this report section, but use of the term in this context is never defined/explained to the reader.	C	The following text will be added as a new second paragraph in renumbered Section 3.1.9: "For the purposes of this discussion, the term plume "intensity" is used as a general term in the absence of plume mass calculations to describe	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
				relationship of the peak concentrations detected within the plume to the concentrations near the plume boundary and the percentage of the area within the plume where highly elevated concentrations are present. An "intense" plume will have very high peak concentrations and high concentrations distributed throughout the plume area, including near the boundary, while lower intensity would refer to a more diffuse plume with only a few high concentrations, and mostly lower concentrations through the rest of the plume."	
61	3.1.4 Plume Stability section, Shallow Zone Stability Evaluation subsection, last paragraph, 2nd to last sentence, page 3-17.	Per page 2 of Table 3-1, "January 2021" should be "February 2021" (i.e., "…between February 2021 and January 2022.") for the well 16EW04 TCE concentration comparison for these 2 months/years.	C	Text (in renumbered Section 3.1.9) will be revised as suggested.	
62	3.1.4 Plume Stability section, Intermediate Zone Stability Evaluation subsection, last paragraph, 1st complete sentence on top of page (begins with "Therefore,"), page 3-18.	Fig. 3-4 citation in sentence should be fig. 3-2 (i.e., "…plume map comparison on **Figure 3-2**…").	C	Citation in text (in renumbered Section 3.1.9) will be revised to Figure 3-2.	
63	3.2.1 Landfill Biobarrier #1 section, Oxidation-Reduction Potential subsection, 3rd	Unclear what is meant by "The ORP is *not expected to be influenced in wells outside of the treatment area*." Additional explanation is warranted.	C	The referenced sentence will be deleted.	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
	sentence, page 3-20.				
64	3.2.1 Landfill Biobarrier #1 section, Nitrate subsection, last sentence, page 3-20.	Sentence refers to nitrate concentrations continuing to be below 1.0 µg/L, but no reference to the specific wells this is applicable to are identified.	C	The wells sampled for MNA parameters in each area are listed at the beginning of each subsection in Section 3.2. The sentence referenced will be revised to read: "The nitrate concentrations in the three wells sampled for MNA parameters continue to be below 1.0 mg/L during the second year RA-O sampling, which is indicative of denitrification and that nitrate will not inhibit anaerobic degradation of site COCs."	
65	3.2.2 Landfill Biobarrier #2 section, Total Organic Carbon subsection, 1st complete sentence on the top of page 3-21.	The comma between "Well" and "16WW26" at the beginning of the sentence is unneeded.	C	The comma referenced in the comment will be deleted as suggested.	
66	3.2.2 Landfill Biobarrier #2 section, Total Organic Carbon subsection, last sentence, page 3-21.	Would be preferable to use "TOC" instead of "carbon" because it was the constituent that was measured in water samples.	C	Text will be revised as suggested.	
67	3.2.2 Landfill Biobarrier #2 section, pH subsection, 3rd to last sentence, page 3-21.	Should add "in January 2022" after "7.01 standard units" (i.e., "… the pH was measured at 7.01 standard units in January 2022.").	C	Text will be revised as requested.	
68	3.2.2 Landfill Biobarrier #2 section, Oxygen-	ORP levels are measured, not "detected" as indicated in this sentence. Need to revise usage here and elsewhere in report, if used.	C	Text will be revised as suggested.	

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	Reduction Potential subsection, 2nd to last sentence, page 3-22.				
69	3.2.2 Landfill Biobarrier #2 section, Geochemical Indicator and MNA Parameter Summary subsection, 1st complete sentence on top of page 3-24.	Part of the sentence indicates "…upgradient elevated concentrations are migrating into the biobarrier…". Upgradient elevated concentrations cannot migrate into the biobarrier, but upgradient groundwater with high concentrations can. Consequently, suggest revising this part of the sentence to "…suggest that upgradient groundwater with elevated concentrations is migrating into the biobarrier…") or something similar. This comment is applicable to other parts of the report where similar wording is used.	C	The sentence referred to in the comment will be revised to read: "The fluctuating concentrations of TCE and cis-1,2-DCE at 16IW03 suggest that the upgradient groundwater containing elevated COC concentrations is migrating ..."	
70	3.2.3 Landfill Biobarrier #3 section, Dissolved Oxygen subsection, 2nd sentence, page 3-24.	Unclear if intent of sentence was to compare concentrations between the 1st and last quarters of the year 2 RA-O sampling or provide a range of the minimum and maximum values measured during that timeframe. If intent was to indicate the range, the sentence as currently constructed is incorrect because the highest DO measurement was 0.87 mg/L on 7/22/21. Regardless, it would be helpful to revise the sentence for clarity. Additionally, the word "an***a***erobic" at the end of the sentence is misspelled.	C	Text has been revised to read: "At 16IW10, located in the treatment area, the DO fluctuated between 0.03 and 0.87, with an average of 0.43 mV during the Year 2 RA-O, suggesting that the treatment area is anaerobic."	
71	3.2.3 Landfill Biobarrier #3 section, Nitrate subsection, last sentence, page 3-25.	Sentence does not indicate which compounds are specifically being referred to in relation to the "anaerobic degradation." Thus, something needs added after "inhibit the anaerobic degradation" at end of sentence.	C	The sentence construction in each of the nitrate discussions in section 3.2 will be revised to "…nitrate will not inhibit anaerobic degradation of site COCs."	
72	3.2.3 Landfill Biobarrier #3 section, Alkalinity subsection, 2nd	Per table 2-5, alkalinity was measured in well 16IW10 at a value of 1,130 mg/L in January 2022, not 1,300 mg/L as indicated in this sentence.	C	Text will be revised to "1,130 mg/L".	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
	sentence, page 3-25.				
73	3.2.5 Mid-Plume Area, Shallow Zone section, Methane subsection, 1st sentence, page 3-29.	The 1st sentence as currently constructed is incorrect because methane was detected once during year 2 monitoring in well 16EW03 at a concentration below 500 mg/L (164 J mg/L on 10/20/21 per page 3 of table 2-7).	C	Text will be revised to read: "At 16EW03, located in the treatment area, methane was detected above 500 mg/L during the Year 2 Quarters 1, 2, and 4 RA-O sampling events with a concentration of 574 mg/L in Quarter 4 (January 2022)."	
74	3.2.6 Mid-Plume Area, Intermediate Zone section, Methane subsection, 2nd sentence, page 3-32.	Per page 1 of table 2-8, the 6,400 µg/L methane value for well 16EW05 should be 6,440 µg/L (sample from 1/27/22).	C	Text will be revised to "6,440 µg/L"	
75	3.3.1 Landfill Biobarrier #1, 1st sentence, page 3-32.	DHC was measured at a concentration less than 2.9 cells/mL in the LB #1 area, so sentence is incorrect as currently constructed if intent was to show the highest and lowest values (of course, it would be correct if intent was to convey the lowest to highest detected/measured values—if so, sentence should be revised). Per table 2-3, a value of < 0.5 cells/mL was measured in well 16WW25 in the 1st quarter of year 2 monitoring (sample from 4/20/21).	C	The referenced sentence will be revised to add "Detected" to the front of the sentence prior to "DHC".	
76	3.3.5 Mid-Plume Area, Shallow Zone, 2nd sentence, page 3-33.	Per table 2-7, DHC was measured at a value of 192 cells/mL in April 2021 in the shallow zone of the mid-plume area, so sentence is incorrect as currently constructed if intent was to compare values for the 2 dates in the sentence. The 25.8 value is for the last quarter of year one monitoring (1/21/21).	C	Text will be revised to read: "At this well, the population increased from 25.8 cells/mL in January 2021 (Year 1 Quarter 4) to 563 cells/mL in January 2022 (Year 2 Quarter 4), suggesting that microbial populations are increasing (Table 2 7)."	
77	3.3.5 Mid-Plume Area, Shallow Zone, 3rd sentence, page 3-33.	Should add "in January 2021" after "in the treatment area at monitoring well 16EW02".	C	Text will be revised as suggested.	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
78	3.3.6 Mid-Plume Area, Intermediate Zone, 3rd sentence, page 3-34.	A table 2-8 callout is missing at the end of the 1st sentence (i.e., end of sentence should be "…ranging from 19.9 to 43.8 cells/mL (**Table 2-8**)".).	C	Text will be revised as suggested.	
79	3.4 Screening for MNA Value Evaluation, 1st paragraph, 3rd sentence, page 3-34.	The word "to" is missing between "according" and "the USEPA criteria."	C	Text will be revised as suggested.	
80	3.4 Screening for MNA Value Evaluation, 2nd paragraph, 2nd sentence, page 3-34.	Would be helpful to indicate which of the 2 wells cited had the stable trend and which well had no trend for perchlorate.	C	Text will be revised to read: "Well 16WW16 showed no trend for perchlorate, and well 16WW48 showed a stable trend for perchlorate ."	

Response to Comments on
Draft Second Annual Remedial Action Operation Report, LHAAP-16

Document Date: October 28, 2022
Comment Date: November 10, 2022

Reviewers: April Palmie - TCEQ
Respondent: Lena Sierocinski - Army

1. Respondent Concurs (C), Does Not Concur (D), Takes Exception (E), or Delete (X)
2. Commenter Agrees (A) with response, or Does Not Agree (D) with response

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
1	2.1.2/ 2-1 & 2-2	End of 1st and beginning of 2nd paragraphs – Correct inconsistency related to redevelopment. 1st paragraph says "did not result in a significant change to the measured total depth" and 2nd says "redevelopment of wells changed the total depth".	C	The final sentence in the first paragraph will be revised to read: "The redevelopment of these wells increased the measured total depth of the redeveloped wells slightly but did not reduce the siltation to below 10% of the screened interval."	
2	Figure 2-27	Add a note for 16EW05-07 similar to "analytical detection limits are much higher than the MCL of 5 µg/L due to dilution of the samples caused by the presence of residual EVO in those wells"	C	A note "3" will be added to the headers for the data tables for 16EW05, 16EW06, and 16EW07 and the note will be defined in the figure legend as follows: "Analytical detection limits for samples from 16EW05, 16EW06, and 16EW07 were significantly higher than the MCLs due to the dilution of the samples that was necessary because of the presence of residual EVO in the wells."	
3	Metals 2.2.4 and Table 2-11	The narrative indicates metal sampling was already conducted (after the time period covered by this report) and references Table 2-11. Add clarification to narrative that the well locations, not the results, are included in the table and results will be in Year 3 report. Last sentence says "will" be analyzed, revise to "were".	C	The text in Section 2.2.4 will be revised to read: "This sampling was conducted in conjunction with Year 3 Semiannual Event #1 in June/July 2022 at the locations shown in Table 2-11 and the results will be reported in the Third Annual RA-O Report. In accordance with Section 4.8 of the RAWP (Bhate 2018a), samples from the full list of monitoring wells from Table 1-2 of the RAWP were analyzed for thallium, and samples from	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
		Table 2-11 Revise title says “Proposed” but narrative indicates sampling was already conducted. Also remove row “Most Recent Results”. Note “b”, I think you should add “Historically” at the beginning.		selected wells were analyzed for arsenic, chromium, manganese, and/or nickel based on the previous results. “ Table 2-11 title will be revised by deleting “Proposed” and contents will be revised as suggested.	

Draft Final
Second Annual Remedial Action Operation Report, LHAAP-16 Landfill
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Acronyms and Abbreviations

µg/L	micrograms per liter
1,1,2-TCA	1,1,2-trichloroethane
1,1-DCE	1,1-dichloroethene
1,2-DCA	1,2-dichloroethane
ABC+™	microscale ZVI and ABC™
ABC™	carbon source
AECOM	AECOM Technical Services, Inc.
APTIM	Aptim Federal Services, LLC
Bhate	Bhate Environmental Associates, Inc.
cells/mL	cells per milliliter
cis-1,2-DCE	cis-1,2-dichloroethene
cm/sec	centimeters per second
COCs	contaminants of concern
CVOCs	chlorinated volatile organic compounds
DHC	Dehalococcoides ethenogenes
DO	dissolved oxygen
EDS-ER™	Electron Donor Solution Extended Release
EPA	see USEPA
EVO	emulsified vegetable oil
IRA	interim remedial action
ISB	in-situ bioremediation
J	estimated value
Jacobs	Jacobs Engineering Group, Inc.
LHAAP	Longhorn Army Ammunition Plant
LUC	land use control
MC	methylene chloride
MCL	maximum contaminant level
mg/L	milligram(s) per liter
MNA	monitored natural attenuation
mV	millivolt(s)
No.	number
OHM	OHM Remediation Services Corp.
ORP	oxidation-reduction potential
PCL	protective concentration level
RACR	Remedial Action Completion Report

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Acronyms and Abbreviations (continued)

RA-O	remedial action operation
RAWP	Remedial Action Work Plan
RD	Remedial Design
ROD	Record of Decision
SDC-9™	APTIM's dechlorinating microbial consortium
TCE	trichloroethene
TCEQ	Texas Commission on Environmental Quality
TOC	total organic carbon
U	Not detected. The analyte was analyzed for, but not detected above the associated reporting limit.
U.S.	United States
U.S. Army	U.S. Department of the Army
USEPA	U.S. Environmental Protection Agency
VC	vinyl chloride
VOC	volatile organic compound
ZVI	zero valent iron

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1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Tulsa District, contracted Bhate Environmental Associates, Inc. (Bhate) under the Omaha Multiple Environmental Government Acquisition National Small Business Multiple Award Task Order Contract, Environmental Remediation Services with Military Munitions Response Program, Task Order No. W9128BV17F0150, to conduct environmental restoration at the former Longhorn Army Ammunition Plant (LHAAP). The Bhate Team consists of Bhate as the prime contractor and Aptim Federal Services, LLC (APTIM) as a subcontractor responsible for remedial activities at several sites, including LHAAP-16. LHAAP is an active, government-owned, formerly contractor operated and maintained Department of Defense facility located in east Texas (**Figure 1-1**).

LHAAP is located in east-central Texas, in the northeastern corner of Harrison County between State Highway 43 in Karnack, Texas, and the western shore of Caddo Lake (**Figure 1-1** and **Figure 1-2**). The nearest cities are Marshall, Texas, approximately 14 miles to the southwest, and Shreveport, Louisiana, approximately 40 miles to the east. Caddo Lake is a large freshwater lake that bounds the former LHAAP installation to the northeast.

LHAAP-16 is a capped landfill covering approximately 17.8 acres in the south-central portion of LHAAP (**Figure 1-2**). Harrison Bayou is located along the eastern edge of the LHAAP-16 and flows into Caddo Lake, northeast of the former LHAAP. The landfill covered approximately 13 acres prior to the cap construction. It was established in the 1940s for the disposal of solid and industrial wastes and was used until the 1980s, when disposal activities were terminated.

The contaminated media at LHAAP-16 include buried source material (landfill waste under the cap) and the shallow and intermediate groundwater beneath and downgradient of the landfill. The U.S. Department of the Army (U.S. Army) and the U.S. Environmental Protection Agency (USEPA) signed an Interim Record of Decision (ROD) (U.S. Army 1995), and the Texas Water Commission (now the Texas Commission on Environmental Quality [TCEQ]) concurred in 1995 approving an interim remedial action (IRA) for LHAAP-16 to mitigate potential risks posed by buried source material at the site. The IRA included the construction of a landfill cap, which is considered a component of the final remedy for the site. Construction of the multilayer cap was completed in 1998. The groundwater extraction system was voluntarily installed by the U.S. Army in 1996 and 1997 as a treatability study to prevent the groundwater plume from migrating to Harrison Bayou (OHM Remediation Services Corp. [OHM] 1998).

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The Final ROD for LHAAP-16 (including the impacted groundwater) was issued in September 2016 and describes the final selected remedy for the site (U.S. Army 2016). The groundwater contaminants of concern (COCs) identified in the Final ROD include chlorinated volatile organic compounds (CVOCs) (trichloroethene [TCE], cis-1,2-dichloroethene [cis-1,2-DCE], 1,1-dichloroethene [1,1-DCE], 1,2-dichloroethane [1,2-DCA], vinyl chloride [VC], 1,1,2-trichloroethane [1,1,2-TCA], and methylene chloride [MC]), perchlorate, and metals (arsenic, chromium, manganese, nickel, and thallium) in the shallow and/or intermediate groundwater. The Final Remedial Design (RD) was submitted in January 2017, and the Remedial Action Work Plan (RAWP) describing the in-situ bioremediation (ISB) activities was submitted in June 2018 (Bhate 2018a). The injection activities for the ISB remedy took place between September 24 and December 21, 2019, as reported in the Final Remedial Action Completion Report (RACR) in April 2021 (Bhate 2021).

The Remedial Action Operation (RA-O) Report represents the second year of RA-O implementation and summarizes the results of the site inspections and quarterly sampling activities. The second year RA-O quarterly sampling events were conducted in April 2021, July 2021, October 2021, and January 2022.

1.1 Remedial Action Objectives

The remedial action objectives for LHAAP-16, consistent with the reasonably anticipated future use as a national wildlife refuge, are:

- Protection of human health and the environment by preventing exposure to landfill contents.
- Protection of human health and the environment by reducing leaching and migration of landfill hazardous substances into the groundwater.
- Protection of human health by preventing human exposure to the contaminated groundwater.
- Protection of human health and the environment by preventing COCs and COC daughter products from migrating into Harrison Bayou at levels that cause surface water in Harrison Bayou to exceed surface water criteria.
- Return of groundwater to its potential beneficial use as drinking water, wherever practicable.

1.2 Performance Objectives

The remedy selected for groundwater at LHAAP-16 in the Final ROD (U.S. Army 2016) includes the following components:

- Maintenance of the existing landfill cap to preserve its integrity and minimize or prevent infiltration through the landfill.
- Land use controls (LUCs) to maintain the integrity of any current or future remedial or monitoring systems and preventing the use of groundwater contaminated above cleanup levels as a potable water source.
- ISB to reduce contaminant mass in the most contaminated portion of the shallow and intermediate groundwater zones and to reduce the COC concentrations reaching the biobarriers in the future.
- Installation of four biobarriers to reduce the shallow groundwater concentrations to levels that will not cause the surface water to exceed surface water standards, control potential migration of contaminants from the landfill, and reduce groundwater contaminant mass.
- Monitored natural attenuation (MNA) to return groundwater to its beneficial use, wherever practicable. Data from eight quarterly sampling events will be combined with historic data to evaluate the effectiveness of various natural physical, chemical, and biological processes in reducing contaminant concentrations.
- Groundwater and surface water monitoring to evaluate the effectiveness of the cap, confirm the decrease in COC concentrations within the groundwater plume, and protect surface water in Harrison Bayou from the seepage of contaminated groundwater in accordance with the monitoring program established in the RD (AECOM Technical Services, Inc. [AECOM] 2017).
- Long-term operation of the remedy, including maintenance of the landfill cap, maintenance of LUCs, groundwater and surface water monitoring, and reinjection of the vegetable oil in the biobarriers, as needed, to provide continued treatment effectiveness.

The performance monitoring program and LUC inspection program is provided in the RAWP (Bhate 2018a). The performance objectives for the operation of the remedy selected in the ROD are as follows:

- LUC performance objectives to be achieved via annual inspections and maintenance include:
  - Prohibit access to the contaminated groundwater except for environmental monitoring and testing only.
  - Preserve the integrity of the landfill cap and restrict intrusive activities (e.g., digging) that would degrade or alter the cap.

  - Restrict land use to nonresidential.
  - Maintain the integrity of any current or future remedial or monitoring systems.
  - Prevent the use of groundwater contaminated above cleanup levels as a potable water source.
- ISB treatment areas, biobarriers, and MNA remedy performance objectives are:
  - Achieve and maintain plume stability as measured by concentrations decreasing in the majority of performance wells relative to the baseline and/or historical concentrations.
  - Achieve and maintain geochemical conditions conducive to natural attenuation of COCs in the shallow and intermediate groundwater zones based on evaluation of biodegradation screening scores using USEPA guidance.
  - Demonstrate MNA processes are occurring using attenuation rate calculations, increases in COC daughter product concentrations, and microbial culture counts.

The performance objective evaluations for the biobarriers and ISB treatment areas will determine when follow-up injections are necessary in the ISB treatment areas based on the criteria presented in Section 4.7.4 of the RAWP (Bhate 2018a).

The performance of the MNA remedy in the shallow and intermediate groundwater zones outside the active treatment areas will be evaluated after two years of quarterly monitoring. Per the ROD, if MNA is found to be ineffective, a contingency remedy of bio-amendment injections outside the active treatment areas will be implemented following documentation in an Explanation of Significant Differences.

This report summarizes the LUC compliance inspection; monitoring well inspection, maintenance, and repair; results of groundwater and surface water sampling; and an evaluation of the current state of the remedy.

1.3 Conceptual Site Model

The contaminated media at LHAAP-16 includes buried source material (landfill waste under the cap) and the shallow and intermediate groundwater beneath and downgradient of the landfill. The IRA implemented in 1996 through 1998, included placement of a multilayer cap at LHAAP-16 mitigating potential risks posed by buried landfill waste. The cap prevents rainfall from infiltrating and leaching contaminants from principal threat wastes within the landfill. However, groundwater in contact with the buried waste material still provides a mechanism for transportation of COCs away from the landfill (Jacobs Engineering Group,

Inc. 2000). A groundwater extraction system was installed as a treatability study to prevent the groundwater plume from migrating to Harrison Bayou (OHM 1998).

The groundwater COCs for LHAAP-16 identified in the Final ROD (U.S. Army 2016) include CVOCs (TCE, cis-1,2-DCE, 1,1-DCE, 1,2-DCA, VC, 1,1,2-TCA, and MC), perchlorate, and metals (arsenic, chromium, manganese, nickel, and thallium) in the shallow and/or intermediate groundwater. Five metals (arsenic, chromium, manganese, nickel, and thallium) had sporadic elevated detections in 2009 and were retained as COCs in shallow and/or intermediate groundwater in the Final ROD. The detected metals do not appear to be associated with widespread releases of contamination from the landfill and are presumed to be naturally occurring; however, the concentrations in groundwater may be influenced by changes in the geochemical conditions related to the remediation of the contaminant plumes and they will continue to be evaluated as part of the RA-O.

The pre-remedy sampling conducted in October 2018 and September 2019 showed volatile organic compound (VOC) contamination (over 10,000 micrograms per liter [µg/L] of TCE) in the shallow zone at monitoring wells 16WW16, 16WW36, and 16EW02. Monitoring well and surface water sampling locations are shown on **Figure 1-3**. **Figure 1-4** and **Figure 1-5** show the extent of the TCE and perchlorate plumes in shallow and intermediate groundwater, respectively, based on the pre-remedy sampling conducted in 2018 and 2019. The concentrations and plume contours shown on **Figure 1-4** and **Figure 1-5** are based on the 2019 data, except in cases where the well was not sampled in 2019, in which case the 2018 data was used. The wells with the highest perchlorate concentrations in the shallow zone were 16WW16 and 16WW55, with detections of over 400 µg/L. The highest concentration of VOCs in the intermediate zone was detected at 16WW35, which contained 21,000 µg/L of TCE in October 2018 and 13,000 µg/L in September 2019. TCE was also detected above the maximum contaminant level (MCL) located on the east side of Harrison Bayou at 16WW57 and 16WW58 in September 2019 at 24 µg/L and 4,300 µg/L, respectively. Perchlorate was detected above the protective concentration level (PCL) at four intermediate wells, with the highest concentration of perchlorate detected at well 16WW35, which contained a concentration of over 400 µg/L. One well, 16WW21, in the upper deep groundwater zone, was sampled in October 2018 and did not contain COCs above detection limits. The shallow groundwater plume extent is shown as undefined on the figures at the boundary with Harrison Bayou based on uncertainty regarding the interaction between Harrison Bayou and the shallow groundwater zone. During drilling of 16WW57 and 16WW58 to the east of Harrison Bayou, coarse grained strata were encountered at shallow depths, but there was no indication of saturated conditions at depths that would be consistent with the shallow groundwater zone found to the west of the Bayou.

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Surface water samples collected in October 2018 from three locations, 16SW01, 16SW02, and 16SW03, shown on **Figure 1-3**, did not contain VOCs or perchlorate above the detection limits.

Based on the current and historical groundwater elevation data, flow direction is to the east/southeast toward Harrison Bayou in the shallow and intermediate zones. The mean hydraulic conductivity values vary from 1.5×10^{-3} centimeters per second (cm/sec) in the shallow zone to 4.2×10^{-4} cm/sec in the deep zone. The groundwater velocity is estimated to vary from 0.31 feet/year in the deep zone to 37 feet/year in the shallow and intermediate zones (Geosyntec 2009).

Overall, Year 1 and Year 2 RA-O results indicate that perchlorate and TCE concentrations show a reduction in concentrations post ISB injections; however, concentrations remain above the cleanup levels. Majority of the wells located in the treatment area show reduction in COC concentrations and favorable geochemical conditions. Upgradient and downgradient of the biobarriers, conditions were marginally conducive and showed limited biodegradation.

The perchlorate and TCE plume concentrations have generally decreased in concentration between the Year 1 and Year 2 RA-O in the areas where the highest concentrations existed prior to the ISB treatment, although a few locations saw increases in COC concentrations over time. The highest perchlorate and TCE concentrations in Year 2 RA-O were observed in the vicinity of Landfill Biobarrier #2. In Year 2 Quarter 4, the highest TCE concentration was detected at monitoring well 16PM02 at 31,000 µg/L and the highest perchlorate concentration was detected at 16WW16 at 561 µg/L. Overall, the shape of the groundwater plumes mimics the pattern of groundwater flow to the east and southeast.

1.4 In-Situ Bioremediation Activities

ISB was conducted at LHAAP-16 to remediate groundwater impacted with VOCs and perchlorate from September through December 2019. As planned in the RD (AECOM 2017) and RAWP (Bhate 2018a), the following six ISB systems were implemented (**Figure 1-3**):

- Landfill Biobarrier #1 in the shallow groundwater zone southwest of the Mid-Plume Area and adjacent to the landfill.
- Landfill Biobarrier #2 in the shallow groundwater zone west of the Mid-Plume Area and adjacent to the landfill at the location of the past Semi-Passive Biobarrier Demonstration.
- Landfill Biobarrier #3 in the shallow groundwater zone west of the Mid-Plume Area and adjacent to the landfill and immediately north of Landfill Biobarrier #2.

- A “Bayou Biobarrier” in the shallow groundwater zone northeast of the Mid-Plume Area near Harrison Bayou.
- A biogrid in the shallow groundwater zone in the Mid-Plume Area.
- A biobarrier in the intermediate groundwater zone in the Mid-Plume Area.

The primary injection components were the carbon source and APTIM’s dechlorinating microbial consortium (SDC-9™). The same carbon source (an emulsified vegetable oil [EVO] product known as Electron Donor Solution Extended Release [EDS-ER™] from Tersus Environmental, LLC) was used for the injection mixtures at all ISB areas except for the Bayou Biobarrier. EDS-ER™ was supplied as a water mixable oil that contains no water; therefore, it was mixed with water in the field to generate the applicable volumes for each barrier in accordance with the RAWP (Bhate 2018a). At the Bayou Biobarrier, an amendment mixture referred to as ABC+™ (composed of microscale zero valent iron [ZVI] and a carbon source [ABC™]) was used instead of EDS-ER™. ZVI was added to the injectate solution at the Bayou Biobarrier to supplement the other amendments and accelerate degradation of the site COCs. The volume of amendment mixtures injected at each area and the targeted injection intervals are provided in the RACR (Bhate 2021). The EDS-ER™ product used contains EVO, which should not require replenishment for three to five years (AECOM 2017). The long-lived C14 to C18 fatty acids contained in the ABC+™ used in the Bayou Biobarrier are expected to last at least two years.

Pre-remedy (baseline) sampling was conducted in October 2018 and September 2019 in the shallow and intermediate zone in accordance with the RAWP, which included both the shallow and intermediate zones and is summarized in the Final RACR (Bhate 2021). The pre-remedy sampling began in October 2018 before all wells were installed. The remaining well installations were delayed by heavy rainfall and saturated ground conditions that persisted through the spring of 2019. The final wells were installed in August 2019. Overlapping with this time period, the groundwater extraction system was inoperable from December 26, 2018, to September 3, 2019, due to damage to the main LHAAP electrical transformer. After groundwater extraction resumed on September 4, 2019, the extraction system was operated for approximately two weeks prior to sampling to allow aquifer hydraulic conditions to stabilize. To address the possibility that the October 2018 results might not be representative of conditions at the start of ISB due to the extraction system outage, the September 2019 pre-remedy sampling network consisted of a representative subset of the sampling network from the RAWP (Bhate 2018a), with concurrence from TCEQ and USEPA (TCEQ 2019, USEPA 2019). While fluctuations in concentration were observed in some wells between the October 2018 and September 2019 events, the groundwater flow directions and extent of contamination were comparable between the two

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events. The September 2019 sampling results are the most representative of the conditions present immediately prior to the ISB implementation.

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2.0 SITE ACTIVITIES AT LHAAP-16

This section describes the results of the second annual RA-O activities from February 2021 to January 2022, including the annual LUC compliance inspection, quarterly groundwater monitoring, and monitoring system inspections performed at LHAAP-16.

2.1 Annual LUC Compliance Inspection

2.1.1 LUC Inspection

The annual LUC compliance inspection was performed on October 25, 2021. The objectives of the LUCs at LHAAP-16 are to prevent human exposure to groundwater contamination presenting an unacceptable risk to human health and ensure that there is no withdrawal or use of groundwater beneath the site for anything other than environmental monitoring and testing, as well as requiring the integrity of any current or future remedial monitoring systems to be maintained. The LUCs also prohibit intrusive activities within the landfill boundary for as long as the landfill waste remains or until levels of COCs in soil and groundwater allow for unlimited use and unrestricted exposure.

The Annual LUC Compliance Certification Documentation Form for the second year RA-O monitoring period is included in **Appendix A**. No noncompliance issues or concerns were noted during the annual inspection.

2.1.2 Groundwater Monitoring Network Inspections and Maintenance

No damage to bollards, well pads, or protective casings was observed during the 2021/2022 well inspections, and minimal encroachment of weeds or brush on the well pads was observed. Area mowing and clearing around the wells is conducted on an as-needed basis, but typically is done before sampling events. Mowing at LHAAP-16 was conducted on July 7, 2021, and October 12, 2021, during the second year of RA-O. Well inspection forms for each of the sampling events are included in **Appendix B**. **Appendix B** includes a photo log and well inspection forms which document the condition of the wells during the inspection. Twelve wells required maintenance to address issues identified in the *Final First Annual RA-O Report* (Bhate 2022a). Monitoring wells 16IW03, 16IW04, 16PM02, 16PM03, 16PM06, 16PM09, 16PM14, 16WW30, 16WW31, 16WW32, 16WW35, and 16WW36 were repainted between October 13 and October 16, 2021. Additionally, as shown in **Table 2-1**, monitoring wells 16EW08, 16WW13, and 16WW37, which were silted more than 10 percent during the Year 1 RA-O, were redeveloped in October 2021 in accordance with the recommendation from the *Final First Annual RA-O Report* (Bhate 2022a). The well redevelopment logs for these wells are included in **Appendix B**. The redevelopment of these

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wells increased the measured total depth of the redeveloped wells slightly but did not reduce the siltation to below 10% of the screened interval.

The well siltation measurements from the Year 2 RA-O are included in **Table 2-1**. Wells 16EW08, 16WW13, 16WW37, 16WW40, and 16WW42 showed screen siltation of 10.2 to 22.8 percent during the Year 2 Quarter 4 RA-O sampling event. As mentioned previously, monitoring wells 16EW08, 16WW13, and 16WW37 were silted during the first year RA-O and redeveloped in October 2021. The redevelopment of wells changed the total depth; however, the wells continue to exceed 10 percent siltation. It is possible that the total well depths may have been recorded erroneously during installation and therefore show up as silted even though they have been redeveloped, or calcification or other mineralization of silt in the well may have created a hard bottom that is resistant to redevelopment. Monitoring wells 16WW40 and 16WW42 also showed siltation in excess of 10 percent throughout the Year 2 RA-O Monitoring, except for the Year 2 Quarter 2 (July 2021) sampling event at 16WW42. The current siltation level does not appear to be affecting the groundwater elevation measurements or the ability to collect representative samples from the wells that were redeveloped in October 2021. Wells 16WW40 and 16WW42 were redeveloped during the June 2022 Year 3 semiannual sampling event.

Wells 16EW05, 16EW06, and 16EW07 were treated with Scrud Remover™, as discussed in the *Final First Annual RA-O Report* (Bhate 2022a), to try to break down the oil residue and associated biosludge that had accumulated in the wells following their use as injection locations. The Part A Scrud Remover™ (45 gallons per well) was added to the wells from September 14 to September 16, 2021. Following the addition of Part A, the wells were allowed to rest for ~10 hours before flushing with the prepared Part B solution began. The wells were taking both products very slowly and recovery of the wells after being filled to the top was very slow (less than 5 feet per day in the case of 16EW05). The Part B flush water was added over the next several months at volumes the wells would accept. It was originally planned to flush each well with ~180 gallons of Part B solution. However, 16EW05 reached a point after approximately 120 gallons of Part B was added that it was recovering at less than 5 feet per week and additional flushing was discontinued. While the solid scrud that had blocked 16EW05 from being gauged or sampled was no longer present, significant viscosity remained from the residual material in the well. Wells 16EW06 and 16EW07 were able to accept the full 180 gallons of Part B solution, and the level of residual scrud in both wells reduced significantly, as evidenced by reduced viscosity of the well contents. While the levels of biosludge and oil residue were reduced by the treatments, the groundwater elevations in all three wells remain anomalously high and the level of oil residue is still interfering with the ability of the laboratory to run groundwater samples from the wells without high dilutions or using methods that are approved for solid samples instead

of liquids. Therefore, it is recommended that efforts to sample 16EW05, 16EW06, and 16EW07 be discontinued and these wells will be replaced in the monitoring network by well 16IW26 and a new well to be installed in the intermediate zone between 16EW06 and 16EW07.

2.2 Groundwater Monitoring

The second annual reporting period includes the period from February 2021 through January 2022 and encompasses the second year of post-injection quarterly monitoring. Quarterly groundwater sampling events were conducted in April 2021, July 2021, October 2021, and January 2022. The RA-O groundwater monitoring network approved in the Draft Final RAWP (Bhate 2018a) includes 61 wells for groundwater sampling and gauging and three locations for surface water sampling. The analytes for each well are summarized in **Table 2-2**. The RA-O monitoring well locations are depicted on **Figure 2-1**.

Before collecting groundwater samples, the wells were gauged using a water level probe and both the depth to water and total depth of the well were recorded to the nearest 0.01 foot from the top of casing. Depth-to-water measurements were used to calculate the groundwater elevations presented in **Table 2-1**. Water samples were collected using low-flow sampling methods, as described in the groundwater sampling procedures discussed in the *Final Installation-Wide Work Plan* (Bhate 2018b) to minimize turbidity in the groundwater samples. After water quality parameters stabilized and were within acceptable ranges per the Installation-Wide Work Plan, samples were collected at the same low flow rate.

Groundwater sample collection logs are presented in **Appendix C**. Chain-of-custody forms, laboratory reports, and data validation reports are presented in **Appendix D**.

2.2.1 Groundwater Elevations and Flow Direction

During the second year RA-O quarterly sampling events, groundwater elevations measured in individual wells varied by anywhere from 0.1 to 9.3 feet throughout the year, with the largest differential occurring at 16EW07. The highest groundwater elevations generally occurred during the April 2021 or July 2021 events, and the lowest elevations occurred during the October 2021 and January 2022 events. Groundwater elevations are included in **Table 2-1**. The following wells were not used in the development of potentiometric contours for the reasons provided in each bullet:

- Monitoring wells 16IW03 and 16IW04 do not have survey data available and were not included in the development of potentiometric contours.
- Monitoring wells 16EW05, 16EW06, 16EW07, and 16EW08 were not included in the development of potentiometric contours on the Year 2 Quarter 1 and Year 2

Quarter 2 map for the intermediate groundwater zone due to anomalous water level readings compared to the surrounding monitoring wells. The intermediate zone extraction wells 16EW05, 16EW06, 16EW07, and 16EW08 were used for injections as part of the ISB remedy. These wells were noted during sampling to have varying levels of residue from the injections that appears to have affected the well screens and the groundwater elevation measurements to varying degrees.

- Extraction wells 16EW05, 16EW06, and 16EW07 were not included in the development of potentiometric contours on the Year 2 Quarter 3 and Year 2 Quarter 4 map for the intermediate groundwater zone due to anomalous water readings. After redevelopment of extraction well 16EW08 in October 2021, the water level measurements at 16EW08 appeared to be consistent with the surrounding wells and were included in the development of potentiometric maps in Year 2 Quarter 3 and Year 2 Quarter 4.

The groundwater flow gradient for Quarter 1 in the shallow groundwater zone was interpreted to be generally to east and southeast, with localized north and northeastward gradients present near Landfill Biobarrier #1 and in the Mid-Plume Area, respectively (**Figure 2-2**). The groundwater flow gradient in the shallow groundwater zone was interpreted to range from eastward to southward based on the potentiometric maps for Quarters 2, 3, and 4 (**Figures 2-3** through **2-5**). The slight change in groundwater flow direction from Quarter 1 to Quarters 2 through 4 may be attributed to seasonal fluctuations; however, the general groundwater flow direction throughout the site remains towards Harrison Bayou, with the southward and southeastward areas of flow typically mimicking the significant topographic variations in those areas.

The groundwater flow gradient in the intermediate groundwater zone was interpreted to be generally to the east in Quarter 1 (**Figure 2-6**), east-southeast in Quarter 2 (**Figure 2-7**), and southeast in Quarters 3 and 4 (**Figure 2-8** and **Figure 2-9**). Note that the biobarriers and the shallow mid-plume treatment areas were confined to the shallow groundwater zone; therefore, their locations are not shown on the intermediate groundwater zone maps. To describe the location of wells adjacent to the various treatment areas in subsequent sections of this report, it is assumed that the groundwater flow across the site is generally from the west to the east towards Harrison Bayou, though the local flow in the vicinity of the barrier may vary from quarter to quarter. Based on that assumption, the wells to the west of the treatment areas are considered upgradient and wells to the east of the treatment areas are considered downgradient, unless specifically described otherwise.

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2.2.2 Groundwater Analytical Results

Quarterly groundwater samples were collected from 61 monitoring wells and analyzed for perchlorate (EPA Method 6850) and VOCs (EPA Method 8260C). Samples from 25 monitoring wells were also analyzed for selected geochemical parameters as shown in **Table 2-2**. ISB was conducted at LHAAP-16 in six treatment areas (**Figure 1-3**) to remediate groundwater impacted with VOCs and perchlorate:

1. Landfill Biobarrier #1
2. Landfill Biobarrier #2
3. Landfill Biobarrier #3
4. Bayou Biobarrier
5. Mid-Plume Area in shallow groundwater zone
6. Mid-Plume Area in intermediate groundwater zone

The locations of the ISB treatment areas are shown on **Figure 2-1**. The analytical results are discussed for each treatment area in this section. Some of the wells sampled during the RA-O event lie outside of the above six treatment areas and are discussed separately under the "Outside the Treatment Areas" subsection. At several of the wells, matrix interference issues or significantly elevated concentrations caused elevated detection limits for the VOCs. Where elevated detection limits exceed the COCs, they are highlighted in **Tables 2-3** through **2-10**.

Landfill Biobarrier #1

Groundwater samples were collected at seven shallow zone monitoring wells for evaluation of the ISB injection area and two intermediate zone monitoring wells for evaluation of MNA in the intermediate zone, as shown in **Table 2-2**. The analytical results for Landfill Biobarrier #1 are summarized in **Table 2-3** and on **Figure 2-10**. Contamination trend plots for 16WW26 and 16WW42 are included on **Figures 2-11** and **2-12**, respectively. Perchlorate concentrations were below the PCL at upgradient wells, downgradient wells, and the well within the biobarrier during all four quarterly sampling events in the Year 2 RA-O event. Four of the seven shallow zone wells contained TCE above the MCL in Year 2 Quarter 4. The performance well within Landfill Biobarrier #1, 16IW09, contained TCE at a concentration below the MCL in Quarters 1 through 4 of the Year 2 RA-O monitoring. As discussed in **Section 2.2.1**, the overall flow across the site is from west to east towards Harrison Bayou, which is slightly different from the local flow in the vicinity of Landfill Biobarrier #1; considering the overall flow, the wells located west of the barrier are considered upgradient and wells located to the east of the barrier are considered

downgradient. Upgradient well 16RW01 and downgradient well 16RW04 showed TCE concentrations above the MCL during all four quarters of the Year 2 RA-O sampling event; TCE was detected at 1,200 µg/L and 970 µg/L, respectively, in Year 2 Quarter 4 (January 2022). Upgradient well 16RW02 and downgradient well 16RW05 did not show any perchlorate or VOC concentrations above the MCLs/PCLs. Downgradient well 16WW26 showed fluctuating TCE concentrations with a declining trend; TCE decreased from 1,000 µg/L in Year 1 Quarter 4 (January 2021) to 130 µg/L in Year 2 Quarter 1 (April 2021) and further decreased to 26 µg/L in Year 2 Quarter 2 (July 2021), then increased to 440 µg/L in Year 2 Quarter 4 (January 2022). Downgradient well 16WW42 showed TCE concentrations below the MCL in Year 2 Quarters 1 and 2, with TCE increasing above the MCL in Year 2 Quarters 3 and 4 to 180 µg/L and 190 µg/L, respectively. Cis-1,2-DCE at 16WW42 also increased above the MCL in Year 2 Quarters 3 and 4.

The intermediate zone monitoring well, 16WW13, located southeast of the barrier, showed increasing TCE concentrations in Year 2 RA-O. TCE was detected at 2,300 µg/L in Year 2 Quarter 4 (January 2022) compared to 22 µg/L in Year 2 Quarter 1 (April 2021). Perchlorate and VOC concentrations were below the MCLs/PCLs at downgradient intermediate well 16WW25.

Landfill Biobarrier #2

Groundwater samples were collected at seven shallow zone monitoring wells for evaluation of the ISB injection area, as shown in **Table 2-2**. Groundwater samples were also collected at one shallow zone well and one intermediate zone monitoring well for evaluation of MNA in the vicinity. The analytical results for Landfill Biobarrier #2 are summarized in **Table 2-4** and on **Figure 2-13**. Perchlorate was detected above the PCL at two out of three upgradient wells (16PM03 and 16WW16) at 278 µg/L and 561 µg/L, respectively, in Year 2 Quarter 4 (January 2022). Perchlorate was detected below the PCL at performance monitoring well 16IW03, within the biobarrier. Perchlorate was detected below the PCL at four out of five downgradient wells for all four quarters. Perchlorate was detected above the PCL at 16WW35 in the intermediate zone 75 feet east of the biobarrier during all four quarters.

Performance monitoring well 16IW03 showed a slight increase in TCE concentration, from 8,900 µg/L in Year 2 Quarter 1 (April 2021) to 9,000 µg/L in Year 2 Quarter 3 (October 2021) which then reduced to 5,600 µg/L in Year 2 Quarter 4 (January 2022). The concentration of cis-1,2-DCE increased from 11,000 µg/L in Year 2 Quarter 1 (April 2021) to 15,000 in Year 2 Quarter 4 (January 2022), indicating that biodegradation is likely occurring. TCE concentrations continue to remain well above the MCL at upgradient wells 16PM02, 16PM03, and 16WW16 and downgradient wells 16PM06, 16PM14, 16PM09, and 16WW36. Contaminant trend charts for downgradient wells 16PM06 and 16WW36 are

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included on **Figures 2-14** and **2-15**, respectively. TCE was detected at 29,000 µg/L at upgradient monitoring well 16WW16 in Year 2 Quarter 4 (January 2022). The low TCE concentration (5,700 µg/L) at 16WW16 in Year 1 Quarter 4 (January 2021) seems like an anomaly since TCE concentrations in Year 2 increased back to levels consistent with historic concentrations. The 31,000 µg/L TCE concentration detected in upgradient well 16PM02 in Year 2 Quarter 4 is above the concentrations detected in Year 2 Quarters 1, 2, and 3, but is consistent with historical concentrations prior to Year 2. In the downgradient wells, 16PM06 consistently showed the highest TCE concentrations during Year 2 and in Year 2 Quarter 4 (January 2022) TCE was detected at 28,000 µg/L. TCE, cis-1,2-DCE, VC, 1,1-DCE, and 1,2-DCA concentrations remain above the MCLs in upgradient and downgradient wells. The presence of VC and cis-1,2-DCE in the vicinity of Landfill Biobarrier #2 is an indication that reductive dechlorination is occurring.

Well 16WW35, located to the east of the biobarrier in the intermediate zone, showed a slight increase in TCE concentrations from 9,300 µg/L in Year 2 Quarter 1 to 11,000 µg/L in Year 2 Quarter 4, but that concentration still represents an overall decline in TCE concentration compared to the baseline concentration of 21,000 µg/L from October 2018.

Landfill Biobarrier #3

Groundwater samples were collected from five shallow zone monitoring locations for evaluation of the ISB injection area and two shallow zone locations for evaluation of MNA in the vicinity, as shown in **Table 2-2**. The analytical results for Landfill Biobarrier #3 are summarized in **Table 2-5** and on **Figure 2-16**. Contaminant trend charts for wells 16IW10 and 16RW10 are included on **Figures 2-17** and **2-18**.

Perchlorate was not detected above the PCL upgradient of the biobarrier. Perchlorate was detected above the PCL downgradient of the biobarrier at two wells 16RW10 and 16WW55. In Year 2, the perchlorate concentration at 16RW10 decreased from 36.5 µg/L in April 2021 to below the 17 µg/L PCL in January 2022 (4.1 µg/L). Perchlorate continued to remain above the PCL at 16WW55 in Year 2 Quarter 4 (January 2022) at a concentration of 297 µg/L, which is above the concentration of 259 µg/L detected in Year 1 Quarter 4, but below the September 2019 Baseline concentration of 480 µg/L.

The TCE concentration at performance well 16IW10 showed a decline in concentrations from 200 µg/L in Year 1 Quarter 1 (March 2020) to below the MCL in Year 2 Quarter 3, and the concentration remained below the MCL in Year 2 Quarter 4 (0.91 J µg/L). Upgradient of the biobarrier, in Year 2 Quarter 4, TCE concentrations were above the MCL at three of the upgradient wells (16RW06, 16RW07, and 16WW14) with the highest concentrations at 16RW07 at 540 µg/L.

Downgradient of the biobarrier, TCE at 16WW55 decreased from 5,900 µg/L in October 2018 (pre-remedy sampling event) to 2,900 µg/L in Year1 Quarter 4 (January 2021), and further decreased to 2,500 µg/L in Year 2 Quarter 4. At downgradient well 16RW09, TCE increased from 810 µg/L in Year 2 Quarter 1 to 1,400 µg/L in Year 2 Quarter 2 and then decreased to 730 µg/L in Year 2 Quarter 4.

Bayou Biobarrier

Groundwater samples were collected from six shallow zone monitoring wells for evaluation of the ISB injection area, as shown in **Table 2-2**. One shallow zone well, one intermediate zone monitoring well, and one upper deep zone well were sampled to evaluate MNA in the area of the Bayou Biobarrier. The analytical results are summarized in **Table 2-6** and on **Figure 2-19**. Contaminant trend charts for wells 16IW20, 16RW11, and 16WW40 are included on **Figures 2-20** through **2-22**.

During the Year 2 Quarter 4 sampling, perchlorate was detected above the PCL at one shallow well located south of the southern arm and cross-gradient of the Bayou Biobarrier (16WW12) at a concentration of 30.5 µg/L. Perchlorate was detected above the PCL in the one intermediate zone well west of the Bayou Biobarrier (16WW41). During the Year 2 RA-O, perchlorate concentrations at 16WW41 fluctuated within a range of 59.1 µg/L to 212 µg/L, with perchlorate detected below the PCL in Year1 Quarter 4 and at 59.1 µg/L in Year 2 Quarter 4.

Within the biobarrier, the TCE concentration at shallow zone performance monitoring well 16IW20 decreased from 850 µg/L in Year 1 Quarter 1 to 5.7 µg/L in Year 2 Quarter 1, decreased to below the MCL in Year 2 Quarter 3 (October 2021), and remained below the MCL in Year 2 Quarter 4 (January 2022). TCE concentrations at 16RW11 continued to remain below the MCL in Year 2. Monitoring well 16WW39, located southwest of the Bayou Biobarrier in the shallow zone, showed a reduction in TCE concentration from 3,900 µg/L in October 2018 to 300 µg/L in February 2021, with a further reduction to 120 µg/L in January 2022. TCE concentrations at upgradient well 16WW12 fluctuated between 1,100 µg/L and 2,100 µg/L during the Year 2 RA-O, with a concentration of 1,100 µg/L in Year 2 Quarter 4 (January 2022). The downgradient well 16WW40 showed a post-injection increase in TCE concentrations compared to the pre-remedy sampling event in October 2018. TCE increased from 660 µg/L in October 2018 to 1,700 µg/L by Year 1 Quarter 2 and then decreased to 540 µg/L in Year 2 Quarter 4 (January 2022). Monitoring well 16WW56, located northeast of the Bayou Biobarrier, showed an increase in TCE concentration from 27 µg/L in September 2019 to 520 µg/L in March 2020 (Year 1 Quarter 1), followed by a decline to 7 µg/L by Year 2 Quarter 4 (January 2022).

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The intermediate zone well located west of the Bayou Biobarrier (16WW41) has shown an overall reduction in TCE concentrations from October 2018 to Year 2 Quarter 4 (January 2022) through natural attenuation processes; however, the Year 2 Quarter 4 concentrations remained above the MCL at 3,800 µg/L. Monitoring well 16WW21, located west of the Bayou Biobarrier in the upper deep zone, did not contain detectable COC concentrations during any of the four quarters of the Year 2 RA-O.

Mid-Plume Area in the Shallow Groundwater Zone

Groundwater samples were collected from six shallow zone monitoring locations, as shown in **Table 2-2**. The analytical results for the Mid-Plume Area in the shallow groundwater zone are summarized in **Table 2-7** and on **Figure 2-23**. The contaminant trend graphs for wells 16EW02, 16WW30, and 16WW48 are included on **Figures 2-24** through **2-26**.

Perchlorate was detected above the PCL in two of the wells in the shallow zone (16EW01 and 16WW48). Perchlorate in 16EW01 decreased from 180 µg/L in Year 1 Quarter 4 to 61 µg/L in Year 2 Quarter 4, but both results were above the other quarterly concentrations detected in Years 1 and 2, suggesting seasonal fluctuation. The perchlorate concentrations at 16WW48 decreased from 122 µg/L in Year 1 Quarter 4 to below the PCL for the first time in Year 2 Quarter 4 (January 2022).

All six shallow zone monitoring wells (16EW01, 16EW02, 16EW03, 16EW04, 16WW30, and 16WW48) showed TCE concentrations above the MCL in Year 2 Quarter 4 (January 2022). The highest TCE concentration was detected at upgradient monitoring well 16EW02 at 19,000 µg/L in Year 2 Quarter 4 (January 2022); TCE concentrations at 16EW02 showed an overall decline from 38,000 µg/L in January 2021 to 19,000 µg/L in January 2022. cis-1,2-DCE showed increasing concentrations compared to pre-remedy sampling results, indicating that reductive dechlorination is occurring. Monitoring well 16EW01, located at the northern upgradient edge of the treatment area, showed a decline in TCE concentration from 3,700 µg/L in Year 1 Quarter 1 (March 2020) to 1,800 µg/L in January 2022 (Year 2 Quarter 4). TCE concentrations at monitoring well 16WW30, located downgradient and outside of the treatment area, fluctuated during Year 2 RA-O between 11 µg/L (April 2021) and 32 µg/L (October 2021) with TCE detected below the MCL in Year 1 Quarter 4 and at 31 µg/L in Year 2 Quarter 4 (January 2022); however, all values at 16WW30 are well below the September 2019 Baseline concentration of 360 µg/L. Well 16WW48, located downgradient and outside of the treatment area, showed increasing concentrations of COCs; TCE increased from 8,800 µg/L during the pre-remedy sampling event in October 2018 to 14,000 µg/L in Year 1 Quarter 3 (October 2020) and remained relatively stable through Year 2, with concentrations ranging between 13,000 µg/L and 15,000 µg/L, with the Year 2 Quarter 4 (January 2022) concentration at 13,000 µg/L. The cis-1,2-DCE concentrations

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increased at a higher rate than TCE concentrations, indicating reductive dechlorination was occurring concurrent with TCE desorption.

Mid-Plume Area in the Intermediate Groundwater Zone

Groundwater samples were collected from seven intermediate zone monitoring locations, as shown in **Table 2-2**. The analytical results for the Mid-Plume Area in the intermediate groundwater zone are summarized in **Table 2-8** and on **Figure 2-27**. Due to matrix interference resulting from the presence of residual injection products, detection limits were elevated at 16EW05, 16EW06 and 16EW07. Monitoring well 16EW08, which was also used as an injection location, has not retained significant residual from the injections and difficulties achieving detection limits below the MCL/PCL have not been encountered. See **Section 2.2.3** for recommendations to address the issues with these wells. The contaminant trend graphs for wells 16WW51 and 16WW49 are included on **Figures 2-28** and **2-29**, respectively.

Perchlorate concentrations remained below the PCL at all monitoring wells in the Mid-Plume intermediate zone during the Year 2 RA-O.

Trend identification for TCE in wells 16EW05, 16EW06, and 16EW07 is problematic because the analytical detection limits are much higher than the MCL of 5 µg/L due to dilution of the samples caused by the presence of residual EVO in those wells. Monitoring well 16EW08 showed a decline in TCE concentrations from 52 J µg/L in Year 1 Quarter 1 (March 2022) to below the MCL at 3.4 µg/L in Year 2 Quarter 4 (January 2022). TCE and other COCs at monitoring well 16WW29 remained below the MCLs from the pre-remedy sampling event throughout Year 1 and Year 2 RA-O. Monitoring well 16WW49 showed a decline in TCE concentration from 260 µg/L in September 2019 to below the MCL at 2.5 µg/L in January 2021; however, TCE increased to above the MCL in Year 2 Quarter 1 (April 2021) and remained above the MCL in Year 2 Quarter 4 (January 2022) at 46 µg/L.

Monitoring well 16WW51, located downgradient of the mid-plume treatment area, showed a decline in TCE concentration from 1,000 µg/L in Year 1 Quarter 4 (January 2021) to 560 µg/L in Year 2 Quarter 1 (April 2021); however, the TCE concentration increased to 3,200 µg/L by Year 2 Quarter 4 (January 2022). The increase in cis-1,2-DCE concentration indicates that reductive dechlorination is occurring.

Outside the Treatment Areas

Groundwater samples were collected from seven shallow zone monitoring locations and seven intermediate zone monitoring locations for evaluation of MNA outside of the treatment areas, as shown in **Table 2-2**. The analytical results for wells outside of the treatment and

that are not used to evaluate the performance of treatment areas are summarized in **Table 2-9** and on **Figure 2-30**. Perchlorate was detected above the PCL at 1 out of 14 monitoring wells in the Year 2 RA-O sampling event. The perchlorate concentrations detected in intermediate zone monitoring well 16WW37, located at the western upgradient end of the site, increased from 2.74 µg/L in July 2021 to 168 µg/L in October 2021 before falling back to 55.3 µg/L in January 2022.

In the Year 2 RA-O, TCE was detected above the MCL during the Year 2 RA-O at four locations (16WW37, 16WW38, 16WW57, and 16WW58). At shallow zone monitoring well 16WW38, TCE was detected at 4,400 µg/L in October 2018, decreased to 2,300 µg/L by Year 1 Quarter 4 (January 2021), and decreased further to 1,200 µg/L by Year 2 Quarter 4 (January 2022). In the intermediate zone, TCE at monitoring well 16WW37, located at the western upgradient edge of the site, was detected at a concentration of 180 µg/L in Year 2 Quarter 4 (January 2022), which is an increase from the 84 µg/L detected during the 2018 pre-remedy sampling and the 99 µg/L detected in Year 1 Quarter 4 (January 2021). Monitoring wells 16WW57 and 16WW58, installed across the Harrison Bayou, contained TCE at 85 µg/L and 5,500 µg/L, respectively, in the Year 2 Quarter 4 (January 2022) samples, both of which are the highest values detected during the baseline sampling event and RA-O.

2.2.3 Approved Year 3 Groundwater Monitoring Network

The Final RD (AECOM 2017) indicated that sampling would be conducted semiannually after Year 2 and that the monitoring network would be modified based on the results of the MNA evaluation and remedial performance. Revisions to the RA-O monitoring network were proposed in the Technical Memorandum for LHAAP-04 and LHAAP-16 (Bhate 2022b) and approved by TCEQ and EPA. The additions and removals to the RA-O monitoring network are listed below and also included in **Table 2-10** and on **Figure 2-31**.

- Remove 16RW02 from the RA-O monitoring network because it is clean and redundant. Upgradient well 16RW01 is currently being sampled.
- Replace 16RW11 with 16RW12 because 16RW11 is clean and duplicates the monitoring location 16IW20. Monitoring well 16RW12 will provide an additional monitoring location immediately adjacent to and downgradient of the northern portion of the Bayou Biobarrier.
- Remove 16WW14 from the RA-O monitoring network due to redundancy. There are three upgradient wells currently being monitored.
- Remove 16WW21 from the RA-O monitoring network since it is clean and is located in the upper deep zone.

- Remove 16EW05, 16EW06, and 16EW07 from the RA-O monitoring network due to biofouling caused by their use as injection locations. These wells will be replaced in the monitoring network by well 16IW26 and a new well proposed for installation in the intermediate zone between 16EW06 and 16EW07, as shown on **Figure 2-31**.

In addition, the following analyte changes will be made to optimize the analytical data collected to improve evaluation of ISB performance within and near the treatment zones and focus the MNA evaluation outside of the treatment areas:

- Remove analysis for bromide from all locations because it is no longer needed to evaluate the injection radius for the RD.

- Replace alkalinity with carbon dioxide for consistency with the MNA parameters collected elsewhere at LHAAP, in accordance with the *Final Technical Memorandum – Monitored Natural Attenuation Parameters* (Bhate 2019).

- Adjust MNA parameters to be analyzed at wells outside of the treatment areas that are contaminated with detectable concentrations of COCs and/or within the treatment areas in downgradient locations expected to be affected by the ISB remedy.

- Change some of the DHC sampling locations within the Biobarriers to allow more effective evaluation of the third line of evidence in **Section 3.3**.

2.2.4 Metals Sampling

The selected remedy in the ROD requires sampling of groundwater for metals for the first five year review to determine if further monitoring of metals is warranted. This sampling was conducted in conjunction with Year 3 Semiannual Event #1 in June/July 2022 at the locations shown in **Table 2-11** and the results will be reported in the Third Annual RA-O Report. In accordance with Section 4.8 of the RAWP (Bhate 2018a), samples from the full list of monitoring wells from Table 1-2 of the RAWP were analyzed for thallium, and samples from selected wells were analyzed for arsenic, chromium, manganese, and/or nickel based on the previous results.

2.3 Surface Water Sampling

Surface water samples were collected at three locations (16SW01, 16SW02, and 16SW03) in Harrison Bayou during three out of four quarterly RA-O sampling events. The bayou was flowing strongly during the April 2021, July 2021, and January 2022 sampling events. There was no flow in the Bayou in Year 2 Quarter 3 (October 2021), and therefore, surface water samples were not collected. The locations and results are shown in **Table 2-12** and on **Figure 2-32**. Photographs of the monitoring locations taken at the time of sampling for the

April 2021, July 2021, and January 2022 events are located in the photographic log in **Appendix B**. Since Harrison Bayou flows from south to north, 16SW03 is the upstream sampling location and 16SW01 is the downstream sampling location.

These samples were analyzed for VOCs, perchlorate, metals, and field parameters. The field parameters included field measurements of dissolved oxygen (DO), pH, oxidation-reduction potential (ORP), conductivity, turbidity, and temperature. The analytical results for the three sample locations are presented in **Table 2-12**. VOCs were not detected at any of the three locations; Perchlorate was not detected at any of the three locations in the first three quarters and was detected at estimated concentrations below the PCL in Year 2 Quarter 4. Arsenic, chromium, manganese, and nickel were detected but found to be below their respective cleanup levels. Thallium was detected in the sample from 16SW01, collected during the April 2021 sampling event, at a concentration of 0.00117 milligrams per liter (mg/L) and was not detected in the remaining samples.

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3.0 REMEDY EVALUATION

This section presents the results of the natural attenuation evaluation in accordance with the three lines of evidence discussed in the Final RD (AECOM 2017) for LHAAP-16 groundwater COCs.

For the evaluation of the remedy, monitoring wells within 15 feet of an injection location, in the same groundwater zone, are assumed to be under the direct influence of the treatment zone, while wells located downgradient from the treatment areas are expected to possibly be influenced by the effects of the injections as treated groundwater flows into these areas. Wells located cross-gradient (parallel to groundwater flow direction) from the treatment areas may not show any direct influence from the treatment but can be useful in monitoring geochemical changes outside of but adjacent to the treatment areas. Wells located outside the 15-foot radius of influence were not expected to show reductions in COC concentrations in the first few quarters of sampling during Year 1, though downgradient wells should eventually show reductions over time depending on their distance from the treatment area. **Table 2-2** breaks down the list of wells in each treatment area by their location with respect to the treatment zones. The discussion of the first line of evidence in **Section 3.1** separates the wells into those inside of the treatment area and those outside of the treatment area in order to single out the locations where the effects from the ISB treatment would be expected to be observed during Year 2 of RA-O monitoring.

3.1 First Line of Evidence: Change in COC Concentrations

Natural attenuation is the combination of multiple mechanisms that reduce contaminant concentrations, including biodegradation, volatilization, dilution, advection, and sorption. The decrease of COC concentrations over time in the absence of any other treatment is evidence of natural attenuation, though the observed decrease or increase in COC concentrations may also be influenced by other factors such as short-term fluctuations in groundwater elevations and other natural attenuation processes such as volatilization, sorption, aquifer dilution, and dispersion.

TCE and perchlorate are the most widespread COCs in the shallow and intermediate groundwater. Historical perchlorate and TCE concentrations are shown in **Table 3-1** and discussion of their trends and degradation are provided in **Sections 3.1.1.1** through **3.1.1.6**.

3.1.1 Landfill Biobarrier #1

COC concentrations for the Year 2 RA-O sampling events are provided on **Figure 2-10** as well as in **Table 2-3**. Contaminant trends for monitoring wells 16WW26 and 16WW42 are shown on **Figures 2-11** and **2-12**.

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Within Treatment Area

No COCs were observed above the cleanup levels during the Year 2 RA-O sampling at monitoring well 16IW09, located in the treatment area. It appears that 16IW09 was installed in an area of the biobarrier that does not contain significantly elevated COCs; therefore, the effect of the biobarrier during the second year of monitoring cannot be fully evaluated due to fluctuations of the detection limits and the lack of clear trends in COC concentrations. Ethane and ethene (ethylene) are the two end products of the reductive dechlorination pathways for chlorinated ethanes and ethenes. At 16IW09, ethene concentrations increased from below the detection limit to 6.6 µg/L in January 2022, suggesting that reductive dechlorination is occurring in the treatment zone.

Outside Treatment Area

To evaluate the groundwater coming into the treatment area, two wells were evaluated upgradient, 16RW01 and 16RW02. During the Year 2 RA-O, TCE levels at 16RW01 decreased from 3,000 µg/L to 1,200 µg/L between the Quarter 1 and Quarter 4 sampling events; however, elevated COCs continue to migrate into the biobarrier. At 16RW02, all COCs continue to be below the MCL/PCLs.

Downgradient well 16WW26 historically contained TCE as high as 4,580 µg/L in May 2013 and then decreased to 1,000 µg/L in January 2021 (**Table 2-3**). During the Year 2 RA-O, concentrations of TCE continued to decrease to 26 µg/L in July 2021; however, the levels fluctuate seasonally, and the January 2022 result was 440 µg/L as shown on **Figure 2-11**.

During the Year 1 RA-O, downgradient well 16WW42 showed a reduction in TCE concentration to below the MCL in March 2020 and remained below the MCL for subsequent quarters. During the Year 2 RA-O, TCE concentrations remained below the MCL in the first two quarters; however, both TCE and cis-1,2-DCE levels increased during the last two quarters. The increase may be due to groundwater level fluctuations as shown on **Figure 2-12**. In January 2022, TCE and cis-1,2-DCE concentrations were detected at 190 µg/L and 1,200 µg/L, respectively.

At downgradient well 16RW04, TCE concentrations decreased from 3,000 µg/L to 970 µg/L between Year 1 Quarter 1 in March 2020 and Year 2 Quarter 4 in January 2022. During the same time period, concentrations of cis-1,2-DCE also decreased from 120 µg/L to 66 µg/L, below the MCL of 70 µg/L. The data suggest that groundwater is being treated upgradient, resulting in cleaner groundwater migrating to this well and decreasing COC concentrations.

Monitoring well 16WW25 is screened in the intermediate groundwater, and all COCs continue to be below the detection limit.

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At monitoring well 16WW13, also screened in the intermediate groundwater zone, TCE, cis-1,2-DCE, and VC have increased to 2,300 µg/L, 690 µg/L, and 10 µg/L, respectively in January 2022. TCE increased by two orders of a magnitude from 22 µg/L in Year 2 Quarter 1 (April 2021) to 2,300 µg/L in Year 2 Quarter 4 (January 2022), while cis-1,2-DCE increased fivefold from 140 µg/L in Year 2 Quarter 1 (April 2021) to 690 µg/L in Year 2 Quarter 4 (January 2022). The increase in TCE suggests migration of contaminants from the landfill is continuing in the intermediate zone, while increases in degradation daughter products, including VC, suggest that reductive dechlorination is occurring and degrading contaminant mass.

Summary

VOC and perchlorate concentrations near the biobarrier were declining prior to the injections. VOC concentrations within the treatment area were below the MCLs in Year 2 Quarter 4 and the final daughter product, ethene, was detected in January 2022. VOC concentrations remain above the MCLs at locations upgradient and downgradient of the treatment area, but daughter products indicative of dechlorination, including cis-1,2-DCE and VC, have been observed. Reductions in COC concentrations are expected in the downgradient wells as groundwater flows through the biobarrier. Semiannual RA-O monitoring will be conducted in the third year to evaluate the impact of the ISB remedy on VOC and perchlorate concentrations.

The injection locations and monitoring locations appear to be placed well to address the contamination in this area relative to the groundwater flow directions observed during the Year 1 RA-O monitoring; however, the Year 2 Quarter 1 flow was nearly parallel to the biobarrier and the flow in the other three quarters was diagonally across the biobarrier, complicating the comparison of upgradient to downgradient locations across the barrier. Similar flow regimes in the future may require adjustment of the monitoring locations to account for this. Future sampling at downgradient wells will aid in determining effectiveness of the biobarriers.

3.1.2 Landfill Biobarrier #2

COC concentrations for the second year RA-O sampling events are provided on **Figure 2-13** as well as in **Table 2-4**. Contaminant trends for monitoring wells 16PM06 and 16WW36 are shown on **Figures 2-14** and **2-15**.

Within Treatment Area

Fluctuations in COC concentrations are observed in upgradient monitoring wells 16PM03, 16WW16, and 16PM02, indicating that elevated concentrations are entering the biobarrier. As elevated levels of COCs migrate downgradient, into and through the biobarrier, increases

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in these compounds may be observed within the biobarrier. Desorption is likely ongoing within the biobarrier and may contribute to the total COC concentrations observed at the upgradient edge of the treatment zone. Elevated levels of VC and ethene concentrations at 16IW03, within the biobarrier, indicate that complete reductive dechlorination is occurring in this portion of the biobarrier. As the COCs are treated in the biobarrier and downgradient active zones, the compounds are expected to decrease.

Monitoring well 16IW03 is located in the biobarrier and in the Year 2 RA-O, TCE continued to decline, from 8,800 µg/L in January 2021 to 5,600 µg/L in January 2022. During this time, the daughter product cis-1,2-DCE increased to 15,000 µg/L and VC fluctuated between 2,500 µg/L and 3,700 µg/L, indicating that these compounds are being created as degradation products and being degraded to lower chlorinated ethenes. Also, at this well, the final degradation product, ethene, fluctuated between 819 µg/L and 1,640 µg/L during the Year 2 RA-O. The decreasing TCE and increasing cis-1,2-DCE, VC, and ethene indicate that complete reductive dechlorination is occurring in the biobarrier and reducing COC mass as groundwater migrates through. Perchlorate has not been detected above the PCL (17 µg/L) at this well during either the Year 1 or Year 2 RA-O sampling events.

Outside Treatment Area

Upgradient of the biobarrier, three wells (16PM03, 16PM02, and 16WW16) are used to evaluate the groundwater coming into the treatment area. At 16PM03, concentrations were detected above the MCL for perchlorate, TCE, cis-1,2-DCE, VC, 1,1-DCE, and 1,2, DCA during the Year 2 RA-O sampling events. In 16PM02, the same compounds are present as in 16PM03, except for perchlorate. TCE was detected in wells 16PM03 and 16PM02 at 6,800 and 31,000 µg/L, respectively, in January 2022.

At 16PM06, located downgradient of the biobarrier, perchlorate has not been detected above the PCL and decreases in each of the other COCs have been observed. TCE concentrations decreased from 77,000 to 28,000 µg/L between April 2021 and January 2022. The degradation products cis-1,2-DCE and VC also decreased over the same time period as treated groundwater migrated into this area. This data indicates that upgradient reductions of COCs are likely the result of the decreases observed in this well. The trend graph on **Figure 2-14** for 16PM06 suggests that groundwater elevation fluctuations may be influencing COC concentrations.

At 16PM09, also located close to and downgradient of the biobarrier, perchlorate has not been observed. At this well, TCE and the degradation products increased during the Year 2 RA-O. The increase in COCs at this well may be due to the high concentrations of COCs migrating and being treated as they move through the biobarrier. The change in concentration

across the barrier is evident as TCE has decreased by at least 95% between 16PM02 (upgradient) and 16PM09 (downgradient) in each of the four quarters. In Year 2 Quarter 4 (January 2022), the TCE concentration decreased from 31,000 µg/L at 16PM02 to 1,300 µg/L at 16PM09.

At monitoring well 16PM14, TCE decreased from 3,800 µg/L in February 2021 (Year 1 Quarter 4) to 2,300 µg/L in Year 2 Quarter 4 (January 2022). At this well, the degradation products cis-1,2-DCE, VC, and 1,2-DCA have fluctuated during the Year 2 RA-O, suggesting that these compounds are being created and degraded to lower chlorinated compounds.

At downgradient well 16WW36, TCE decreased from 22,000 µg/L in October 2018 to 1,500 µg/L in January 2021, increased to 15,000 µg/L in July 2021, and decreased to 8,100 µg/L in January 2022. The same trend was observed for cis-1,2-DCE, as shown on the trend graph for 16WW36 on **Figure 2-15**. TCE daughter products VC and ethene were also detected, and their concentration trends were similar to the TCE and cis-1,2-DCE concentration trends (**Table 2-4**). The same trend observed for each of the compounds suggest that the presence of daughter products is from degradation upgradient and fluctuations may be due to changes in groundwater elevations.

In the intermediate groundwater well, 16WW35, perchlorate, TCE, cis-1,2-DCE, VC, 1,1-DCE, and 1,2, DCA were detected during the Year 2 RA-O sampling events. The concentrations of these compounds have fluctuated during the first two years of RA-O sampling and the groundwater treatment is focused on the shallow zone. Decreases in the intermediate zone may eventually occur as the COCs in the shallow groundwater have been reduced.

Summary

The data indicate that TCE and perchlorate degradation is occurring in Landfill Biobarrier #2, as shown by the decrease in parent products and the presence of daughter products cis-1,2-DCE, VC, and ethene. COCs remain above the MCLs upgradient and downgradient of the biobarrier at this time; however, decreases in COCs are occurring as groundwater COCs are being reduced within the biobarrier and cleaner water is migrating into this area. Two exceptions are 16PM02 and 16PM09 where COCs are increasing, which may be caused by the elevated levels of COCs migrating from upgradient of the biobarrier. Semiannual RA-O monitoring will be conducted in Year 3 to evaluate the impact of the ISB remedy on VOC and perchlorate concentrations.

3.1.3 Landfill Biobarrier #3

COC concentrations for the Year 2 RA-O sampling events are provided on **Figure 2-16** as well as in **Table 2-5**. Contaminant trends for monitoring wells 16IW10 and 16RW10 are shown on **Figures 2-17** and **2-18**.

Within Treatment Area

At monitoring well 16IW10, which lies within the treatment area, all COCs were reduced to below their respective MCLs during the Year 2 Quarter 3 sampling event in October 2021 and remained below the limits in the Year 2 Quarter 4 event in January 2022. The decrease in COCs within the treatment area indicates that the ISB biobarrier is reducing contaminant concentrations as expected. The contaminant trend chart for monitoring well 16IW10 on **Figure 2-17** does not show any definite correlation between groundwater elevations and COC concentrations.

Outside Treatment Area

To evaluate the groundwater coming into the treatment area, two wells (16RW06 and 16RW07) are located upgradient. At 16RW06, only TCE was observed above the MCL and concentrations decreased from 95 µg/L to 37 µg/L between Year 1 Quarter 4 (January 2021) and Year 2 Quarter 4 (January 2022). During the Year 1 RA-O, TCE, 1,1-DCE, cis-1,2-DCE, and VC were detected above their respective MCLs at 16RW07; however, in the Year 2 RA-O, only TCE and VC were above the MCL. At 16RW07, all COC concentrations decreased and TCE and VC were detected at 540 µg/L and 15 µg/L in January 2022. The groundwater containing elevated TCE and VC concentrations upgradient will continue to migrate into the biobarrier as designed, and the compounds are expected to be completely reduced as indicated by the decreases observed at 16IW10. Additionally, TCE concentrations upgradient of the biobarrier were consistently lower than the concentrations downgradient of the biobarrier. Therefore, as the lower upgradient concentrations flow through the barrier in the future, it is expected that downgradient concentrations will decline further reflecting the degradation occurring within the barrier.

The two closest downgradient wells to Biobarrier 3 are 16RW09 and 16RW10, and COC concentrations have fluctuated during the Year 2 RA-O. At 16RW09, TCE was detected during the Year 2 RA-O at 810 µg/L, 1,400 µg/L, 610 µg/L, and 730 µg/L. Although the TCE levels have fluctuated, the presence of relatively stable (not accumulating) concentrations of cis-1,2-DCE and VC suggests that complete dechlorination is occurring.

At 16RW10, perchlorate levels decreased during the Year 2 RA-O and were observed at 4.1 µg/L in January 2022, below the PCL of 17 µg/L. An overall decrease in TCE,

cis-1,2-DCE, and VC was observed at this well during the Year 2 RA-O. Also, ethene was observed during each sampling event and detected at 5.76 J µg/L in January 2022. The contaminant trend chart for monitoring well 16RW10 on **Figure 2-18** shows that the fluctuation in TCE concentrations may be correlated to the fluctuations in groundwater elevations; however, the presence of ethene indicates that complete dechlorination is occurring within the treatment area.

Summary

The ISB remedy is effectively reducing COC concentrations within the treatment area. COCs remain above the MCLs upgradient and downgradient of the biobarrier at this time; however, decreases in COCs are occurring as groundwater COCs are being reduced within the biobarrier and cleaner water is migrating into this area. Further reduction in concentrations is expected in the downgradient wells as groundwater flows through the biobarrier and clean groundwater migrates downgradient. Semiannual RA-O monitoring will be conducted in the third year to evaluate the impact of the ISB remedy on site COC concentrations. The injection locations and monitoring locations appear to be placed well to address the contamination in this area relative to the groundwater flow directions observed during the Year 2 RA-O monitoring.

3.1.4 Bayou Biobarrier

COC concentrations for the second year RA-O sampling events are provided on **Figure 2-19** as well as in **Table 2-6**. Contaminant trend charts for monitoring wells 16IW20, 16RW11, and 16WW40 are shown on **Figures 2-20** through **2-22**, respectively.

Within Treatment Area

Two wells are located in the treatment area, 16RW11 and 16IW20, and during the Year 2 RA-O, all COCs have remained below the MCL at 16RW11. At 16IW20, TCE concentrations continued to decrease significantly within the treatment area, from 850 µg/L in March 2020 to below the MCL of 5.0 µg/L in October 2021 and January 2022, as shown on **Figure 2-19**. At 16IW20, VC also decreased during the Year 2 RA-O and was detected at 4.6 µg/L in January 2022, slightly above the MCL of 2.0 µg/L. Ethene was detected at 16IW20 during the Year 2 RA-O at estimated concentrations between 6.77 J µg/L and 20.2 J µg/L, indicating that complete reductive dechlorination is occurring in the treatment area. A contaminant trend chart for 16RW11 is shown on **Figure 2-21**. Based on the proximity of 16RW11 and 16IW20 to each other and the lack of COC concentrations in 16RW11, it is recommended that 16RW11 be replaced with 16RW12 in the Year 3 monitoring network to allow evaluation of the northern end of the Bayou Biobarrier.

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Outside Treatment Area

As discussed at the other biobarriers, to evaluate the groundwater potentially coming into the treatment area, two cross-gradient wells (16WW39 and 16WW12) and two upgradient wells (16WW22 and 16WW41 [intermediate zone well]) are sampled. During the Year 2 RA-O, upgradient shallow zone TCE concentrations ranged from 7.6 µg/L at 16WW22 to 1,100 µg/L at 16WW12. At intermediate zone well 16WW41, TCE was detected at 6,200 µg/L in Year 2 Quarter 1, and ethene was detected at an estimated concentration of 14.3 J µg/L, indicating that complete dechlorination is occurring within the intermediate zone upgradient of the treatment area. Cross-gradient well 16WW39 is also located downgradient of the Mid-Plume shallow treatment area, and TCE was detected at 330 µg/L in April 2021 and continued to decrease during the Year 2 RA-O to 120 µg/L in January 2022 (**Table 2-6**). TCE at cross-gradient well 16WW12 fluctuated during the Year 2 RA-O and was detected at 1,100 µg/L in January 2022, while the cis-1,2-DCE concentration remained relatively stable over the same timeframe.

During the Year 1 RA-O, perchlorate at 16WW39 decreased from 62 µg/L to below the PCL in February 2021 and remained below the limit during the Year 2 RA-O. Due to the generally east-southeast groundwater flow direction, the only true downgradient well in the current monitoring network is 16WW40. Groundwater is flowing generally parallel to the southern portion of the biobarrier based on the Year 1 and 2 RA-O potentiometric surface maps. At downgradient well 16WW40, TCE increased during the Year 1 and 2 RA-O sampling events to as high as 1,900 µg/L in July 2021. However, after July 2021, TCE levels began to decrease and, by January 2022, TCE was detected at 540 µg/L, as shown on **Figure 2-22**; below the baseline level of 740 µg/L observed in September 2019, as shown on **Figure 1-4** and **Table 2-6**. The cis-1,2-DCE concentrations exceeded the MCL in all four Year 2 RA-O sampling events, with the concentration declining from 210 µg/L in April 2021 to 120 µg/L in January 2022 (**Table 2-6**). During this time, 1,2-DCA at 16WW40 rose above the MCL following the injections and remained there until it decreased to 3.7 µg/L in January 2022, below the MCL of 5 µg/L (**Table 2-6**).

Perchlorate was detected above the PCL of 17 µg/L during the Year 2 RA-O sampling events at only two wells (16WW12 and 16WW41), at 30.5 µg/L and 59.1 µg/L, respectively, in January 2022. At 16WW41, which is located in the intermediate zone, perchlorate decreased from 212 µg/L to 59.1 µg/L between April 2021 and January 2022. Monitoring well 16WW12 is close to the biobarrier and generally cross-gradient, and therefore may be seeing some level of influence from the dispersion of the amendments, since perchlorate concentrations in this well also decreased from 42.1 µg/L in April 2021 to 16 µg/L in July 2021. However, perchlorate levels at this well increased to 30.5 µg/L in January 2022, suggesting that contaminant mass may be migrating into this area.

The elevated levels upgradient will migrate into the biobarrier and are expected to be reduced in the biobarrier. The data do not show any definite correlation between groundwater elevations and COC concentrations. Contaminant trend charts for wells 16IW20, 16RW11, and 16WW40 are included on **Figures 2-20** through **2-22**.

Summary

The ISB remedy is effectively reducing COC concentrations within the treatment area at 16IW20. COC concentrations have decreased downgradient of the treatment area at 16WW40, which indicates that groundwater is being treated in the treatment zone and aiding in decreasing concentrations downgradient. COC concentrations are above the MCL/PCL in most wells upgradient and downgradient of the biobarrier but are expected to decrease in the downgradient wells as groundwater flows through the biobarrier in locations where the flow is crossing the barrier. Semiannual RA-O monitoring will be conducted in the third year to evaluate the impact of the ISB remedy on VOC and perchlorate concentrations. As discussed in **Section 1.3**, a shallow saturated zone that would correlate to the shallow groundwater zone on the west side of Harrison Bayou was not detected in intermediate monitoring wells 16WW57 and 16WW58. Therefore, the Bayou Biobarrier is likely to only influence the shallow zone between the biobarrier and the bayou. As mentioned in the First Annual RA-O Report (Bhate 2022a), the groundwater hydraulic gradient near the southern end of the Bayou Biobarrier indicates that groundwater is flowing to the east-southeast, nearly parallel to the barrier instead of crossing it. It is likely that the barrier is not adequately treating the groundwater flowing to the east-southeast from the mid-plume treatment area, and it is suggested that a southward extension of the biobarrier be considered to treat this flow if concentrations remain elevated at 16WW48 and 16WW30 located to the west of the Bayou biobarrier near the Mid-Plume Area.

3.1.5 Mid-Plume Area (Shallow)

COC concentrations for the second year RA-O sampling events are provided on **Figure 2-23** as well as in **Table 2-7**. Contaminant trends for monitoring wells 16EW02, 16WW30, and 16WW48 are shown on **Figures 2-24**, **2-25**, and **2-26**.

Within Treatment Area

Within the treatment area, four wells (16EW01, 16EW02, 16EW03, and 16EW04) are used to evaluate the treatment zone. At monitoring well 16EW02, TCE was detected at 38,000 µg/L in Year 1 Quarter 4 (January 2021) and during the Year 2 RA-O, concentrations decreased from 23,000 µg/L to 19,000 µg/L between April 2021 and January 2022 (**Figure 2-24**). During the Year 1 and 2 RA-O time period, both cis-1,2-DCE and VC also fluctuated.

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At monitoring well 16EW03, TCE decreased from 250 µg/L to 84 µg/L between April 2021 and January 2022. The fluctuating concentrations of cis-1,2-DCE and VC and the presence of ethene at elevated levels indicates that reductive dechlorination is occurring.

Monitoring well 16EW04 is located on the downgradient edge of the treatment zone, and during the Year 1 RA-O, TCE increased from 3,400 µg/L in March 2020 to 17,000 µg/L in February 2021. However, during the Year 2 RA-O, TCE concentrations decreased to 3,400 µg/L in January 2022. Daughter products cis-1,2-DCE and VC were present, which indicates that degradation is occurring upgradient within the treatment area.

While 16EW01 is shown as a treatment zone well, it should be noted that the well is located cross-gradient to flow along the northern edge of the treatment area. This is the only well in the Mid-Plume Shallow Area where perchlorate is present above the MCL of 17 µg/L, and during the Year 2 RA-O, concentrations fluctuated from 29 µg/L in July 2021 to 61 µg/L in January 2022. During the Year 1 RA-O, TCE levels were above 3,500 µg/L. During the Year 2 RA-O, concentrations fluctuated between 970 and 3,500 µg/L and decreased to 1,800 µg/L in Year 2 Quarter 4 (January 2022), suggesting that TCE levels are decreasing. Fluctuating concentrations of cis-1,2-DCE, VC, and the final degradation product ethene indicate that reductive dechlorination is occurring at this site.

Outside Treatment Area

TCE and cis-1,2-DCE concentrations were detected at downgradient well 16WW30; however, both were reduced to below their respective MCLs in January 2021. During the Year 2 RA-O, cis,1-2-DCE remained below the MCL and TCE increased above MCL at 11 µg/L in April 2021 and increased further to 31 µg/L in January 2022. The increase in TCE at this well may be due to contamination migrating from upgradient. The contaminant trend chart for monitoring well 16WW30 shown on **Figure 2-25** does not show any definite correlation between groundwater elevations and COC concentrations.

Monitoring well 16WW48 is located on the downgradient side of the Mid-Plume shallow zone. Perchlorate at 16WW48 decreased from 122 µg/L in Year 1 Quarter 4 (January 2021) to 14.8 µg/L, below the MCL, in Year 2 Quarter 4 (January 2022). The reduction of perchlorate indicates that either the groundwater is becoming more reducing and has utilized this compound as a respiratory substrate or cleaner groundwater has migrated in from upgradient. TCE concentrations increased during the Year 1 RA-O from 7,100 to 13,000 µg/L as shown on **Figure 2-26**, are likely due to a combination of the cessation of groundwater extraction and desorption effects from the treatment zone mobilizing COCs. During the Year 2 RA-O, TCE concentrations in 16WW48 fluctuated between 13,000 µg/L and 15,000 µg/L along with similar levels of cis-1,2-DCE. The final TCE degradation

products, VC and ethene were also observed at their highest levels in October 2021, at 170 µg/L and 23.3 µg/L J, respectively. The increase in both VC and ethene indicates that dechlorination is occurring downgradient of the treatment area.

Summary

The impact of the ISB remedy is limited in the Mid-Plume Area shallow zone. In all wells in the treatment area, COCs decreased during the Year 2 RA-O, which suggests that the amendments aided in reducing contaminant levels. The presence of cis-1,2-DCE, VC, and the final degradation product ethene indicate that reductive dechlorination is occurring. COCs remain above the MCL/PCL upgradient, within, and downgradient of the treatment area. Semiannual RA-O monitoring will be conducted in the third year to monitor reductions in COC concentrations and see if statistically significant trends develop. The injection locations and monitoring locations appear to be placed well to address the contamination in this area relative to the groundwater flow directions observed during the Year 2 RA-O monitoring.

3.1.6 Mid-Plume Area (Intermediate)

COC concentrations for the first year RA-O sampling events are provided on **Figure 2-27** as well as in **Table 2-8**. Contaminant trend plots for monitoring wells 16WW49 and 16WW51 are shown on **Figures 2-28** and **2-29**, respectively. As previously noted, the analyses for VOCs at 16EW05, 16EW06, and 16EW07 were impacted by matrix interference related to the residual injectate and biofouling since the wells were used for injection locations. The evaluation of trends in this section for those wells may have only limited value due to the high detection limits caused by dilution of the laboratory samples.

Within Treatment Area

To evaluate the groundwater within the treatment area, four wells are used (16EW05, 16EW06, 16EW07, and 16EW08). Samples collected from wells 16EW05, 16EW06, and 16EW07 contained residual EVO and required a dilution by the laboratory, resulting in reporting limits that exceeded the MCL for all COCs except perchlorate. During the Year 2 RA-O, perchlorate levels at all four wells were below the MCL of 17 µg/L. Ethane and ethene are the two end products of the reductive dechlorination pathways for chlorinated ethanes and ethenes. During the Year 2 RA-O sampling events, ethane and ethene were detected in well 16EW05 at elevated levels of 34.2 µg/L and 26.1 J µg/L, respectively, in January 2022, which indicates that complete reductive dechlorination is occurring within the treatment area. Dissolved gas samples were not analyzed at 16EW07 or 16EW08 because they were not part of the planned analytical suite in **Table 2-2**, and the remaining samples from 16EW05 and 16EW06 could not be analyzed due to the residual injectate present in the samples.

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TCE was detected at well 16EW06 only once during the Year 2 RA-O, at a concentration of 3,000 µg/L in October 2021. Although the data shows that TCE was below the detection limits of 500 µg/L (April 2021) and 2,400 µg/L (January 2022), the level observed in October suggest that interferences from the residual EVO make the data unlikely to be representative of the groundwater treatment zone. The elevated detection levels at 16EW05 and 16EW07 are also high, and therefore the data do not allow for an evaluation of the groundwater at those wells.

At monitoring well 16EW08, located on the southern edge of the treatment area, residual EVO is not present at levels sufficient to hinder sampling or analysis of the samples. In January 2022, TCE and cis-1,2-DCE were the only COCs above the detection limits and were detected at 3.4 µg/L and 11 µg/L, respectively. During the Year 1 RA-O, TCE was the only COC detected above the slightly elevated detection limit at 52 µg/L in March 2021. Since that time, TCE has been reduced to below the MCL/PCL and remained below these levels during the Year 2 RA-O sampling events. The cis-1,2-DCE concentrations increased during the Year 2 RA-O, but remained below the MCL, with a maximum concentration during Year 2 of 14 µg/L in October 2021, suggesting that degradation of TCE is occurring.

Outside Treatment Area

Monitoring downgradient of the Mid-Plume treatment area in the intermediate zone is performed at three wells (16WW29, 16WW49, and 16WW51). Perchlorate was not detected at any of the three wells during the pre-remedy sampling or the Years 1 and 2 RA-Os. At downgradient monitoring well 16WW49, cis-1,2-DCE continued to decrease, and the January 2022 concentration (60 µg/L) was below the MCL of 70 µg/L for the first time, as shown on **Figure 2-28**. TCE decreased to below the MCL during the first year of RA-O; however, the concentrations increased during the Year 2 RA-O to 46 µg/L in January 2022, which is still below the 260 µg/L detected during the September 2019 pre-remedy sampling.

TCE concentrations also increased at downgradient well 16WW51 from 830 µg/L in Year 1 Quarter 1 (March 2020) to 3,200 µg/L in Year 2 Quarter 4 (January 2022). The cis-1,2-DCE concentration also increased from 25 µg/L to 220 µg/L during the same time frame, which suggests that dechlorination is occurring in the upgradient site groundwater, within the treatment area. At downgradient well 16WW29, chlorinated ethenes were not detected above the MCL during the Year 1 or 2 RA-O events. Ethene and ethane levels at this well were also very low or nondetect, as would be expected since VC was not present. A contaminant trend plot for 16WW51 is shown on **Figure 2-29**.

Summary

Due to the residual EVO affecting samples collected from wells 16EW05, 16EW06, and 16EW07, the elevated detection limits of the VOC data do not allow for an evaluation of the groundwater in the treatment area. However, the elevated levels of ethene and ethane observed in well 16EW05 indicate that complete reductive dechlorination is occurring within the treatment area. During the Year 2 RA-O, TCE increased, and the presence of cis-1,2-DCE indicates that biodegradation is likely occurring. Concentrations of COCs remain below the MCL/PCL at 16WW29 and 16EW08. Semiannual RA-O monitoring will be conducted in the third year to evaluate the impact of the ISB remedy on VOC and perchlorate concentrations.

Based on the ongoing issues with residual EVO and biofouling of 16EW05, 16EW06, and 16EW07 and the lack of a positive response to the Scrud Remover™ treatment attempted during mid- to late 2021, these three wells will be removed from the monitoring network and replaced with 16IW26 and a new well will be installed between 16EW06 and 16EW07, as shown on **Figure 2-31**. These changes to the monitoring network were approved in the Technical Memorandum for Proposed Revisions to the Monitoring Program at LHAAP-04 and LHAAP-16 (Bhate 2022b). The remaining injection locations and monitoring locations appear to be placed well to address the contamination in this area relative to decreases in COCs and the groundwater flow directions observed during the Year 2 RA-O monitoring.

3.1.7 Mann-Kendall Analysis

Mann-Kendall analysis for the Year 2 RA-O monitoring period was completed for 1,1-DCE, 1,2-DCE, cis-1,2-DCE, TCE, VC, and/or perchlorate based on the criteria stated below. At each treatment area, select wells were used for this analysis, one in the treatment zone and one downgradient. Since this was the first time Mann-Kendall analysis was conducted at LHAAP-16, the analysis was performed for any COC that was above the MCL during at least one sampling event within the first two years of RA-O monitoring. A summary table of the Mann-Kendall results is presented in **Table 3-2**. The results are presented in **Appendix E** in graphical format with the statistical results presented on the bottom of the page. The GSI Mann-Kendall Tool Kit was used for this analysis. The concentrations of COCs are presented in µg/L. Half the reporting limit was used for samples with no detected concentration. For locations with duplicate samples, the regular sample was used. The level of statistical significance is calculated for each analysis and provided on the trend analysis sheet. It should be noted that the trends identified in the Mann-Kendall analysis may have been influenced by groundwater elevation fluctuations.

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3.1.7.1 Landfill Biobarrier #1

During the Year 2 RA-O, two wells (16IW09, located in the treatment area, and 16RW04, located downgradient) were used to statistically evaluate trends at this area. At 16IW09, all COCs were below their respective MCLs during the Year 2 RA-O. TCE was the only COC detected above an MCL during the Year 1 RA-O, and a significantly decreasing trend was observed at this well over the first two years of RA-O sampling. During the Year 2 RA-O, TCE and cis-1,2-DCE were observed above their MCLs at 16RW04. At this well, TCE is significantly decreasing and cis-1,2-DCE is probably decreasing, indicating that the treatment zone is working as expected and decreasing concentrations downgradient. VC concentrations at 16RW04 were stable and below the PCL during Year 2 RA-O.

3.1.7.2 Landfill Biobarrier #2

During the Year 2 RA-O, two wells (16IW03, located in the treatment area, and 16PM06, located downgradient) were used to statistically evaluate trends at this area. At 16IW03, TCE, cis-1,2-DCE, VC, 1,2-DCA, and 1,1-DCE were observed above their respective MCLs during the Year 2 RA-O. All of the COCs were either stable or no trend was observed, except for VC, which was probably increasing. As the chlorinated ethenes are sequentially degraded, VC is created; therefore, an increase in VC indicates that reductive dechlorination is occurring. The lack of decreasing trends of the higher chlorinated compounds suggests that additional mass is migrating in from upgradient. Downgradient of the treatment zone, at 16PM06, a stable trend was observed for TCE while decreasing or probably decreasing trends were observed for cis-1,2-DCE, VC, 1,2-DCA, and 1,1-DCE, indicating that the treatment zone is working as expected and decreasing concentrations downgradient.

3.1.7.3 Landfill Biobarrier #3

During the Year 2 RA-O, two wells (16IW10, located in the treatment area, and 16RW10, located downgradient) were used to statistically evaluate trends at this area. During the Year 2 RA-O, TCE, and VC were above their respective MCLs and decreasing trends were observed for TCE, cis-1,2-DCE, and VC at 16IW10, indicating that the groundwater treatment is working as expected in the treatment zone. At 16IW10, all COCs were below their respective MCLs during the Year 2 Quarters 3 and 4 sampling events. At the downgradient well, 16RW10, TCE, cis-1,2-DCE, 1,2-DCA, 1,1-DCE, VC, 1,1-DCE, and perchlorate were all detected above their MCLs during the Year 2 RA-O sampling. A significantly decreasing trend was observed for 1,1-DCE and perchlorate, and both compounds decreased to below their MCLs in January 2022. The other compounds exceeding the MCL had stable trends during the Years 1 and 2 RA-O. The Mann-Kendall analysis indicates that the treatment zone is working as expected and decreasing concentrations of some COCs downgradient.

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3.1.7.4 Bayou Biobarrier

During the Year 2 RA-O, two wells (16IW20 and 16WW40) were used to statistically evaluate trends in this area. At 16IW20 within the treatment zone, TCE, cis-1,2-DCE, 1,2-DCA, and VC were above their respective MCLs during Year 1, while TCE and VC were above their respective MCLs during the Year 2 RA-O. During this time, a decreasing trend was observed for TCE, cis-1,2-DCE, and 1,2-DCA and all decreased to below their respective MCLs by October 2021. In January 2022, only VC was above its MCL and a probably increasing trend was observed for this COC at 16IW20. At the downgradient well, 16WW40, TCE, cis-1,2-DCE, 1,2-DCA, and VC were detected above their MCLs during the Year 2 RA-O sampling. No trends were observed for TCE, 1,2-DCA, and VC and a stable trend was observed for 1,1-DCE and cis-1,2-DCE. As clean groundwater migrates downgradient, decreasing trends are expected to be observed in the future. The Mann-Kendall analysis indicates that the treatment zone is working as expected based on the decreasing concentrations of primary COCs and the probably increasing trend in the daughter product VC.

3.1.7.5 Mid-Plume Area, Shallow Zone

During the Year 2 RA-O, three wells (16EW02, 16EW03, and downgradient well 16WW48) were used to statistically evaluate trends in this area. At 16EW02, TCE, cis-1,2-DCE, VC, 1,2-DCA, and 1,1-DCE were above their respective MCLs during the Years 1 and 2 RA-O. Perchlorate was above the PCL during one sampling event (March 2020) in Year 1. During this time, each of the COCs except for perchlorate remained above the MCL in January 2022. After two years of RA-O at 16EW02, stable trends were observed for TCE and 1,1-DCE and no trend was observed for cis-1,2-DCE, VC, 1,2-DCA, or perchlorate.

At 16EW03, TCE, cis-1,2-DCE, and VC were above their MCLs during the Year 1 and Year 2 RA-O sampling events. During this time, the trends for TCE and cis-1,2-DCE were probably decreasing, and no trend was observed for VC.

At 16WW48, located downgradient of the treatment area, TCE, cis-1,2-DCE, VC, 1,2-DCA, 1,1-DCE, and perchlorate were detected above their respective MCL/PCL during the two years of RA-O. Increasing trends were observed for TCE, cis-1,2-DCE, VC, and 1,1-DCE. A stable trend was observed for perchlorate (below the MCL in January 2022), and no trend was observed for 1,2-DCA. In this area the Mann-Kendall analysis indicates the treatment area is not decreasing COC levels as expected, and increases are occurring downgradient.

3.1.7.6 Mid-Plume Area, Intermediate

During the Year 2 RA-O, two downgradient wells (16WW49 and 16WW51) were used to statistically evaluate trends in this area. At 16IW49, TCE and cis-1,2-DCE were above their MCLs during the Years 1 and 2 RA-O. During this time, no trend was observed for TCE.

A decreasing trend was observed for cis-1,2-DCE and in January 2022 the concentration was below the MCL of 70 µg/L for the first time. At the downgradient well, 16WW51, an increasing trend was observed for TCE and cis-1,2-DCE. The Mann-Kendall analysis for this area indicates that a decreasing trend or no trend has been observed in the northern downgradient area at 16WW49, and increasing trends are occurring in the southern downgradient area at 16WW51.

3.1.7.7 Summary of Mann-Kendall Analysis

The Mann-Kendall analyses for some locations within the biobarriers show decreasing trends; however, it is hard to determine if concentrations have reduced in the mid-plume intermediate treatment area (16EW05, 16EW06, and 16EW07) because the analytical detection limits are much higher than the MCLs due to dilution of the samples caused by the presence of residual EVO in those wells. Increasing trends have been observed in the wells downgradient of the mid-plume area but as treated water migrates downgradient, concentrations in those wells are expected to reduce in the future.

3.1.8 Predictive Modeling

Calculation of time-based attenuation rates was performed as required by the RAWP and was based on the results of the Mann-Kendall analysis (Bhate 2018a). If a statistically significant decreasing trend was determined by the Mann-Kendall analysis and the COC was above the MCL in January 2022, predictive modeling was conducted. The trends for monitoring wells at LHAAP-16 may be influenced by the seasonal fluctuations of groundwater levels, being typically higher in May (spring) and lower during the November (fall) sampling events. Therefore, although estimates of the time to achieve the MCLs have been provided in the discussion below, the current trends may not accurately predict the future declines in COC concentrations. The Mann-Kendall analysis determined that decreasing trends were observed in 7 of the 13 wells, as shown on **Table 3-1**. However, COCs were above the MCLs in only two of those wells (16RW04 and 16PM06) during the January 2022 sampling event.

At Landfill Biobarrier #1, a statistically significant decreasing trend was observed at 16RW04 for TCE. To determine the estimated time to achieve the MCL at this well, a time-dependent attenuation rate was calculated and is provided in **Appendix F**. The first order rate constant was determined to be 0.002 day^{-1} and the time to achieve the MCL of 5 µg/L is estimated to be 7.2 years.

At Landfill Biobarrier #2, statistically significant decreasing trends were observed at 16PM06 for 1,1-DCE, cis-1,2-DCE, and VC. To determine the estimated times to achieve the MCL at this well, time-dependent attenuation rates were calculated and are provided in **Appendix F**. The first order rate constant for 1,1-DCE is 0.002 day^{-1} and the time to achieve the MCL of 7 µg/L is estimated to be 2.2 years. The first order rate constant for cis-1,2-DCE

is 0.003 day^{-1} and the time to achieve the MCL of 70 µg/L is estimated to be 5.0 years. The first order rate constant for VC is 0.002 day^{-1} and the time to achieve the MCL of 2 µg/L is estimated to be 7.1 years.

While these calculations provide an estimated time to achieve the MCL for specific wells within treatment areas (not the entire treatment area), given lithologic variability and significant seasonal groundwater elevation fluctuations at the site during Years 1 and 2, the time necessary to achieve the MCL may vary by an order of magnitude or more. Additionally, the rate of reduction could diminish over time as the residual concentrations decrease, and the time frames to achieve the MCL may be longer than estimated by these calculations.

3.1.9 Plume Stability

Because there were only minor differences between the plume boundaries based on quarter to quarter changes, COC plume maps were completed for the Pre-Remedy, Year 1 Quarter 4, and Year 2 Quarter 4 sampling events, showing the plume extent in the shallow and intermediate zones at the completion of the Year 2 RA-O, and are presented on **Figures 3-1** and **3-2**. **Table 3-1** provides a concise summary of the historical concentrations of TCE and perchlorate. The ISB remedy at LHAAP-16 is not designed or expected to reduce the overall size of the plume immediately. Additionally, as mentioned in **Section 3.0**, wells located outside of the treatment areas were not expected to show significant changes with only two years of post-remedy sampling. This includes wells within the treatment area footprint that were not in the same groundwater zone, and locations that were outside the influence of the ISB treatment areas. However, discussion of these wells has been included in this section because it is an evaluation of the whole plume, including the ISB treatment zones and the broader MNA remedy and they are shown on the plume maps for completeness.

For the purposes of this discussion, the term plume “intensity” is used as a general term in the absence of plume mass calculations to describe relationship of the peak concentrations detected within the plume to the concentrations near the plume boundary and the percentage of the area within the plume where highly elevated concentrations are present. An “intense” plume will have very high peak concentrations and high concentrations distributed throughout the plume area, including near the boundary, while lower intensity would refer to a more diffuse plume with only a few high concentrations, and mostly lower concentrations through the rest of the plume.

TCE and perchlorate are the most widespread COCs in the shallow groundwater. The COC data over the monitoring period indicate that the plumes are stable overall. The lack of complete delineation of the downgradient extent of the plume prevents evaluation of potential downgradient migration or expansion of the plume.

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Shallow Zone Stability Evaluation—In the shallow zone, the shapes of both the TCE and perchlorate plumes are oblong, elongated along the easterly/southeasterly groundwater flowpath. The shallow plumes are shown with a dashed boundary along Harrison Bayou due to uncertainty in the nature of the connection (if any) between the shallow zone and Harrison Bayou, and the absence of a shallow saturated zone in wells 16WW57 and 16WW58, located to the east of Harrison Bayou, as explained in **Section 1.3**. It is unlikely that shallow zone contamination extends across the bayou due to the lack of a shallow saturated zone to the east of the bayou.

The groundwater contaminants follow the pattern of groundwater flow to the east and southeast. The perchlorate plume decreased in size and intensity between the Year 1 and Year 2 RA-O. The perchlorate plumes to the west and east have remained fairly consistent; however, in the primary ISB treatment areas, Biobarrier 3 and the Mid-Plume treatment area are aiding in reducing concentration levels downgradient of these areas. This decrease in perchlorate can be observed in 16RW10, located downgradient of Biobarrier 3, which decreased from 125 J µg/L to 4.1 µg/L, below the MCL/PCL, between the Year 1 and Year 2 RA-O.

The TCE plume in January 2022 resembles the shape of the plume in January/February 2021; however, like the perchlorate plume, the TCE plume has been reduced in intensity between the Year 1 and Year 2 RA-O. In the shallow zone, high TCE concentrations were observed in the vicinity of Landfill Biobarrier #2 and the Mid-Plume Area. Monitoring wells 16IW03, 16PM02, 16WW16, 16PM06, 16WW36, and 16EW02 show high TCE concentrations. Some notable decreases in intensity have been seen at 16EW01 and 16EW04 located in the Mid-Plume area. For example, at 16EW04, TCE decreased from 17,000 µg/L to 3,400 µg/L between February 2021 and January 2022. Additionally, the increase in concentration of daughter products at many of the LHAAP-16 wells indicates that reductive dechlorination is occurring.

Intermediate Zone Stability Evaluation—The COC plume map for Year 2 Quarter 4 in the intermediate zone is presented on **Figure 3-2**. In the intermediate zone, TCE and perchlorate are the most widespread COCs. Perchlorate was reduced to below the MCL/PCL between October 2020 and January/February 2021 (Year 1 Quarter 4). Therefore, the January/February 2021 and the January 2022 plume map comparison on **Figure 3-2** shows the plume has increased. During each of the RA-O sampling events, perchlorate concentrations have been fairly stable in most areas and resembled levels observed during prior sampling events, except for January 2021. The two wells that consistently contain perchlorate are 16WW35 (Biobarrier #2) and 16WW41 (Bayou Barrier). At 16WW35, perchlorate ranged from 342 to 366 µg/L, and at 16WW41, concentrations decreased from

212 to 59.1 µg/L. At the upgradient edge well 16WW37, perchlorate increased from 1.6 µg/L in April 2021 to 55.3 µg/L in January 2022, remaining above the PCL.

The TCE plume has remained relatively stable since baseline. The highest concentrations continue to be observed at 16WW35, 16WW41, and across the bayou at 16WW58. The highest levels continue to be observed at 16WW35, which contained a TCE concentration of 11,000 µg/L in January 2022. At the upgradient well 16WW37, TCE has been present since 2018, however during the Year 2 RA-O, concentrations increased from 99 to 180 µg/L between January 2021 and 2022, suggesting additional mass may be migrating into the LHAAP-16 area.

TCE was detected above the MCL across the Harrison Bayou at 16WW57 and 16WW58. At 16WW58, TCE decreased from to 2,700 µg/L in January 2021 to 1,000 µg/L in July 2021, but then increased to 5,500 µg/L in January 2022. Concentrations of TCE also increased from 57 to 85 µg/L at 16WW57. While increases or decreases in the TCE concentrations across the creek may be due to the ISB treatments, the lack of complete delineation of the downgradient extent prevents evaluation of the potential for downgradient expansion or migration.

Overall, the COC data suggest that the TCE plume is showing overall stable conditions and is not expanding. The effects of the ISB remedy are identifiable as increased evidence of dechlorination in downgradient wells from all treatment areas, but continued monitoring is necessary to determine if it will be sufficient to achieve the performance objective of reducing concentrations to below the cleanup values. The Bayou Biobarrier does not appear to be intercepting contamination migrating from the vicinity of 16WW48 towards the bayou under the potentiometric conditions observed during most of the Year 2 sampling events. Perchlorate concentrations above the PCL were eliminated in the intermediate zone as of Year 1 Quarter 4; however, during the Year 2 RA-O, perchlorate concentrations returned to levels consistent with those prior to the January 2021 data. Semiannual RA-O monitoring will be conducted for the third year to evaluate the effects of the ISB/MNA remedy in the treatment areas and surrounding wells.

3.2 Second Line of Evidence: Geochemical Indicators

Table 2-2 identifies the wells that were chosen to be evaluated for MNA performance parameters. The field parameters for LHAAP-16 wells include DO, ORP, pH, conductivity, turbidity, and temperature. MNA parameters (alkalinity, nitrate, sulfate, dissolved gases, bromide, and total organic carbon [TOC]) were sampled for a subset of wells. In accordance with Section 4.7 of the RAWP (Bhate 2018a), the geochemical indicators ORP and TOC within the treatment areas will be evaluated to determine if or when reinjections may be necessary. When ORP values are less than 50 millivolts (mV), the anaerobic biodegradation

pathway is considered possible in accordance with the biodegradation scoring criteria used for the MNA evaluation in **Section 3.3** (USEPA 1998). Lower ORP values are more favorable for anaerobic biodegradation and less than -50 mV was established as the performance objective for the treated areas in the RD (AECOM 2017). Comparison of the ORP and TOC to the performance goals of ORP < -50 mV and TOC > 20 mg/L, as well as concentration trends in the downgradient wells, will guide the decision to reinject additional carbon source. The second line of evidence for each treatment area is discussed below.

3.2.1 Landfill Biobarrier #1

Field test parameters were measured at all of the monitoring locations to aid in determining the geochemical state of groundwater. Three of the nine wells monitored for Landfill Biobarrier #1 (16IW09, 16WW25, and 16WW26) were analyzed for MNA parameters, bromide, and TOC (**Table 2-2**). One additional well, 16WW42 was also sampled for TOC. Monitoring well 16WW25, sampled for MNA parameters, bromide, and TOC, is located in the intermediate zone, where the biobarrier is not expected to have any influence.

Dissolved Oxygen

DO is the most thermodynamically favored electron acceptor used by microbes for biodegradation of organic carbon, whether natural or anthropogenic (USEPA 1998). Anaerobic bacteria may be inhibited at DO concentrations greater than approximately 0.5 mg/L, and biotic reductive dechlorination is not expected to occur at DO levels above that threshold. During the Year 2 RA-O, the DO levels ranged from 0.03 to 1.19 mg/L and averaged 0.49 mg/L across the site, suggesting that anaerobic conditions exist across the site. In the treatment area at 16IW09, DO levels ranged from 0.03 to 0.58 mg/L during the Year 2 RA-O, as presented in **Table 2-3**. The DO levels suggest that the groundwater in the treatment area is mildly anerobic and has been favorable for reductive dechlorination. RA-O monitoring will be continued to determine if DO levels fluctuate near 0.5 mg/L as they did during the second year.

Oxidation-Reduction Potential

The ORP levels indicate the oxidative or reductive potential in the aquifer matrix and provide real-time data showing if conditions are conducive for anaerobic biodegradation. During the Year 2 RA-O, the ORP ranged between -122 and 311 mV and a level below -50 mV was observed in only one well, 16RW05. At 16IW09, in the treatment area, ORP levels were above -50 mV during all four sampling events. At well 16RW05, close to the downgradient side of the treatment area, the ORP was measured at -122 mV in July 2021 below the performance objective of -50 mV but was above -50 mV in April 2021 (-3.44 mV), October 2021 (-43 mV), and January 2022 (117 mV). The ORP values indicate that conditions in most wells were not conducive to reductive dechlorination.

Nitrate

After DO has been depleted, nitrate may be used as an electron acceptor for anaerobic biodegradation of perchlorate and chlorinated ethenes via denitrification. Nitrate levels above 1 mg/L may compete with the reductive pathway (USEPA 1998). The nitrate concentrations in the three wells sampled for MNA parameters continue to be below 1.0 mg/L during the second year RA-O sampling, which is indicative of denitrification and that nitrate will not inhibit anaerobic degradation of site COCs.

Sulfate

After DO and nitrate have been depleted in the groundwater, sulfate may be used as an electron acceptor for anaerobic biodegradation. This process is termed “sulfate reduction” and results in the production of sulfide. Concentrations of sulfate greater than 20 mg/L may cause competitive exclusion of dechlorination. However, in many plumes with high concentrations of sulfate, reductive dechlorination still occurs (USEPA 1998). **Table 2-3** indicates that the sulfate concentrations at the treatment zone well 16IW09 were below 20 mg/L during the Year 2 RA-O, which is favorable for the reduction of site COCs. Sulfate levels were above 20 mg/L at the downgradient shallow well 16WW26 and the intermediate well 16WW25 during the Year 2 RA-O. The amendments injected into the treatment zone are not expected to influence wells farther downgradient or in the intermediate zone groundwater.

Total Organic Carbon

Regardless of the electron acceptor being used, organic carbon is a required source of reduced hydrogen and energy needed to sustain microbial degradation of contaminants. TOC concentrations greater than 20 mg/L are considered adequate to support microbial activity (USEPA 1998). The carbon source was injected into the treatment zone, which is the only area where elevated levels of TOC are expected to be present. During the Year 2 RA-O, TOC concentrations measured in select wells ranged between 2.55 and 572 mg/L. The TOC level observed at 16IW09, located in the treatment area, decreased from 572 mg/L to 102 mg/L between April 2021 and January 2022 and continues to be at levels favorable for reductive dechlorination. Well 16WW26 is located farther downgradient of the treatment area, and significant increases in TOC were not expected there as concentrations averaged 28 mg/L between March 2020 and July 2021. The COC data indicate that TOC concentrations within the biobarrier have been supportive of reductive dechlorination and that a residual mass of carbon remains present within the biobarrier at 16IW09 to support bacterial populations.

Alkalinity

Alkalinity levels in the groundwater, measured as calcium carbonate, ranged between 15.2 and 782 mg/L during the Year 2 RA-O. In January 2022, the alkalinity level at 16IW09

was 782 mg/L, which is significantly higher than the downgradient well outside of the treatment system, 16WW26, at 43 mg/L. The higher levels observed in the treatment area compared to the background suggest the presence of increased microbial activity.

pH

The pH of groundwater has an effect on the presence and activity of microbial populations in groundwater. Microbes capable of degrading chlorinated aliphatic hydrocarbons and petroleum hydrocarbon compounds generally prefer pH values varying from 6 to 8 standard units (USEPA 1998). During the second annual RA-O event, the pH ranged from 4.49 to 7.25 standard units. In the treatment zone, at 16IW09, the pH was above 6.0 in the most recent two sampling events and was measured at 6.29 standard units in January 2022. At the well closest to the downgradient edge of the treatment zone, 16RW05, the pH was measured at 7.01 standard units in January 2022. The pH levels in and near the treatment area are conducive to biological activity and reductive dechlorination. The sub-optimal pH levels were present in wells farther downgradient; however, biological degradation is not expected to occur at farther distances from the treatment zone.

Methane

Methanogenesis occurs in highly reducing conditions and generally occurs after oxygen, nitrate, and sulfate have been depleted. Methane levels above 500 µg/L are considered to indicate methanogenic conditions (USEPA 1998). Methane was measured in selected wells for MNA evaluation and ranged from 1.18 µg/L to 3,500 µg/L during the Year 2 RA-O. Elevated methane levels were observed within the treatment area at 16IW09 and measured at 936 µg/L in January 2022. Methane levels were below 500 µg/L downgradient of the treatment area.

Geochemical Indicator and MNA Parameter Summary

The qualitative assessment of geochemical indicators during the second annual RA-O event in Landfill Biobarrier #1 indicates that current geochemical conditions (TOC, pH, methane, and alkalinity) remain favorable for the biological reduction of VOCs and perchlorate. TOC exceeds the performance objective of 20 mg/L within the biobarrier and at downgradient location 16WW25, while the ORP levels did not meet the performance objective of less than -50 mV within or downgradient of the barrier during the Year 2 RA-O. Although ORP levels have not been measured below -50 mV in the biobarrier treatment area, all COCs have been reduced to below their MCLs. The geochemical data from the groundwater in the biobarrier indicate that conditions are favorable and sustainable for the degradation of site COCs. The Year 2 monitoring data indicate that no reinjection is recommended at this time. Semiannual RA-O monitoring will be conducted in Year 3 to determine whether conditions continue to be conducive for biological degradation.

3.2.2 Landfill Biobarrier #2

Four of the nine wells (16IW03, 16WW16, 16WW36, and 16WW35) in Landfill Biobarrier #2 were sampled for MNA parameters as shown in **Table 2-2**. Monitoring well 16WW16 is located upgradient of the biobarrier and 16WW35 is screened in the intermediate groundwater zone, where the biobarrier is not expected to have any influence. The well located in the treatment area (16IW03) is the primary well where conditions in groundwater would be expected to be favorable for reductive dechlorination.

Dissolved Oxygen

DO levels for the Year 2 RA-O monitoring events are presented in **Table 2-4**. DO levels in the treatment area at 16IW03 were below 0.5 mg/L during each sampling event of the Year 2 RA-O. DO levels outside the treatment area ranged between 0.07 and 1.42 mg/L with an average of 0.52 mg/L, suggesting that groundwater has been slightly anaerobic during the Year 2 RA-O. Based on the DO readings, groundwater has been below 0.5 mg/L during at least one sampling event during the Year 2 RA-O sampling event at all nine wells and therefore the area is conducive to reductive dechlorination.

Oxidation-Reduction Potential

During the Year 2 RA-O sampling events, the ORP increased in most wells. At 16IW03, located within the treatment area, the ORP increased from -58 mV to 35 mV between April 2021 and January 2022. Also, at 16PM06, located near the biobarrier, the ORP values increased from -33 to 120 mV during the same time period. Outside the treatment area, ORP levels were all measured above -50 mV. The ORP levels during the Year 2 RA-O indicate the groundwater is not reducing and has become more oxidative, which is not conducive to the anerobic degradation of site COCs.

Nitrate

Nitrate levels above 1 mg/L may compete with the reductive pathway (USEPA 1998). The nitrate concentrations were below 1.0 mg/L during the second year RA-O sampling, indicating that nitrate will not inhibit anaerobic degradation of site COCs.

Sulfate

Elevated sulfate levels above 20 mg/L may compete as an electron acceptor with perchlorate and VOCs. Sulfate concentrations in the treatment area, at 16IW03, decreased from 43.3 µg/L in April 2021 to below the detection limit of 1.0 µg/L in January 2022. Outside the treatment area at 16WW16, 16WW35, and 16WW36, sulfate levels remained above 20 mg/L, ranging from 192 to 9,810 mg/L during the Year 2 RA-O. The low levels of sulfate observed in the treatment area indicate that sulfate will not inhibit degradation.

Total Organic Carbon

TOC concentrations were measured in select wells during the Year 2 RA-O and ranged from 4.46 mg/L to 2,860 mg/L. Although TOC levels decreased to below the detection limit of 1 mg/L at the treatment area well 16IW03 in January 2021 (Year 1 Quarter 4), concentrations were above 2,500 mg/L during the Year 2 RA-O. TOC concentrations were also observed above the 20 mg/L criteria in downgradient well 16WW36 at 21.7 mg/L in January 2022. The TOC level at the upgradient well 16WW16 was below 20 mg/L, at 4.69 J mg/L in January 2022. The elevated levels of TOC in the treatment area, upgradient, and downgradient indicate there is a sufficient amount of carbon to support microbial growth.

Alkalinity

Alkalinity levels in the groundwater monitoring wells ranged between 338 and 1,700 mg/L during the Year 2 RA-O events. In January 2022 the alkalinity level at 16IW03 was 1,320 mg/L, which is significantly higher than the background well 16WW16 at 365 mg/L. The higher levels observed in the treatment area compared to the background suggests increased microbial activity.

pH

During the Year 2 RA-O, the pH ranged from 5.13 to 7.14 standard units, with four out of nine wells showing pH in the optimal range. The pH at 16IW03, in the treatment zone, remained below 6.0 standard units, which is not optimal for microbial degradation of site contaminants.

Methane

Methane was measured in selected wells for MNA evaluation and ranged from 15.4 to 3,210 µg/L during the Year 2 RA-O sampling events. The highest levels were observed in the treatment area well, 16IW03, ranging from 1,330 to 3,210 µg/L during the Year 2 RA-O. Methane concentrations indicate reducing conditions are present in the treatment area at well 16IW03.

Geochemical Indicator and MNA Parameter Summary

The qualitative assessment of geochemical indicators for Landfill Biobarrier #2 monitoring locations during the second annual RA-O event at LHAAP-16 indicates that current geochemical conditions remain favorable for the biological reduction of VOCs and perchlorate within the treatment area closest to the biobarrier. The fluctuating concentrations of TCE and cis-1,2-DCE at 16IW03 suggest that the upgradient groundwater containing elevated COC concentrations is migrating into the biobarrier, and the increases in VC and ethene provide evidence that complete reductive dechlorination is occurring. Though the ORP performance objective was not met, low DO, nitrate, sulfate levels and elevated TOC values within the biobarrier indicate that reinjections are not necessary and are not

recommended. Certain parameters observed in a few locations outside of the treatment area may indicate that conditions could favor biological degradation, such as high alkalinity and the presence of degradation products cis-1,2-DCE, VC, and ethene; however, the primary MNA processes reducing concentrations outside of the treatment area are likely to be abiotic, including dilution, dispersion, sorption, and volatilization.

3.2.3 Landfill Biobarrier #3

Seven wells (16IW10, 16RW06, 16RW07, 16RW09, 16RW10, 16WW14, and 16WW55) were sampled for field test parameters to aid in determining the geochemical state of groundwater. Two of the seven wells were sampled for MNA parameters as shown in **Table 2-2**. One of the two wells analyzed for MNA parameters and three of the four wells analyzed for TOC were in locations suitable to monitor the performance of the ISB remedy; while 16WW55 was sufficiently downgradient that the biobarrier is not expected to have a significant influence.

Dissolved Oxygen

DO levels for the Year 2 RA-O monitoring events are presented in **Table 2-5** and ranged between 0.03 and 1.55 mg/L, with an average of 0.55 mg/L. At 16IW10, located in the treatment area, the DO fluctuated between 0.03 and 0.87, with an average of 0.43 mV during the Year 2 RA-O, suggesting that the treatment area is anaerobic. At the two closest wells to the downgradient edge of the biobarrier, 16RW09 and 16RW10, DO levels were measured at 0.41 and 0.61 mg/L in January 2022. The Year 2 RA-O DO data indicate that the groundwater in the treatment area and downgradient has been anerobic during most sampling events, which is conducive to reductive dechlorination.

Oxidation-Reduction Potential

During the Year 2 RA-O, the ORP ranged between -236 and 230 mV. The ORP levels at 16IW10, in the treatment area, were above the performance objective of -50 mV during three out of four quarters (except for Quarter 3) in Year 2 RA-O, suggesting the groundwater conditions are not conducive for the reduction of chlorinated ethenes and perchlorate. The ORP RA-O data suggest that in January 2022, oxidative groundwater conditions (ORP above -50 mV) are present in all six wells which are located either upgradient or downgradient of the Landfill Biobarrier #3 and were not expected to see direct effects of the carbon injection.

Nitrate

Nitrate levels above 1 mg/L may compete with the reductive pathway (USEPA 1998). The nitrate concentrations were below 1.0 mg/L during the second year RA-O sampling, except for the April 2021 sample at 16WW55, where the level was observed at 1.10 mg/L. These data indicate that nitrate will not inhibit anaerobic degradation of site COCs.

Sulfate

Table 2-5 indicates that the sulfate concentrations were below 20 mg/L at 16IW03, in the treatment area. Sulfate levels ranged from 581 and 932 mg/L in the downgradient well 16WW55, which is located outside the influence of the treatment area, and sulfate concentrations are not expected to decrease at this well.

Total Organic Carbon

TOC concentrations were measured in select wells during the Year 2 RA-O and ranged between 2.28 and 746 mg/L. At well 16IW10, in the treatment area, TOC concentrations decreased from 746 to 211 mg/L between April 2021 and January 2022; however, this level continues to be high enough to support reductive dechlorination in the treatment area.

Alkalinity

Alkalinity levels in the groundwater monitoring wells ranged between 303 and 1,190 mg/L during the Year 2 RA-O sampling events. In January 2022, the alkalinity level at 16IW10 was 1,130 mg/L, which is significantly higher than the downgradient well outside of the treatment area, 16WW55 at 305 mg/L. The higher levels observed in the treatment area compared to the background suggests increased microbial activity.

pH

During the Year 2 RA-O, the pH ranged from 5.17 to 6.69 standard units, with four out of seven wells showing pH in the optimal range, indicating conducive conditions for biodegradation. The pH in the treatment area groundwater at 16IW10 has remained above 6.0 standard units and was measured at 6.52 standard units in January 2022.

Methane

Methane was measured in selected wells for MNA evaluation and ranged from 7.09 to 2,520 µg/L during the Year 2 RA-O events. Methane was detected at 2,520 J µg/L at monitoring well 16IW10 in October 2021, indicating highly reducing conditions within the treatment area.

Geochemical Indicator and MNA Parameter Summary

The qualitative assessment of geochemical indicators during the second annual RA-O event in the Landfill Biobarrier #3 area indicates that current geochemical conditions remain favorable for the biological reduction of VOCs and perchlorate within the treatment area. At well 16IW10, TOC exceeds the performance criteria within the treatment area, while the ORP was not below the -50 mV criteria. Based on the reduction of COCs to below cleanup levels, TOC values meeting the performance objectives, the elevated alkalinity, and the presence of ethene, reductive dechlorination is occurring and reinjection is not recommended. Conditions are less conducive to biological degradation upgradient and

downgradient of the treatment area and the primary MNA processes reducing concentrations outside of the treatment area are likely to be abiotic, including dilution, dispersion, sorption, and volatilization.

3.2.4 Bayou Biobarrier

Nine wells (16WW22, 16WW41, 16WW21, 16WW39, 16WW12, 16IW22, 16WW40, 16RW11, and 16WW56) were sampled for field test parameters that are used to aid in determining the geochemical state of groundwater. Four of the nine wells were sampled for MNA parameters and five wells were sampled for TOC as shown in **Table 2-2**. Two of the four wells analyzed for MNA parameters and five of the wells analyzed for TOC were in locations suitable to monitor the performance of the ISB remedy. Wells 16WW41 (intermediate zone) and 16WW21 (upper deep zone) were located upgradient, and 16WW56 is located cross-gradient to the treatment area. These three wells are not expected to show any influence from the biobarrier.

Dissolved Oxygen

DO levels during the Year 2 RA-O are presented in **Table 2-6**. In the treatment area, DO levels ranged between 0.03 and 0.44 mg/L which are favorable for reductive dechlorination. Outside of the treatment area, DO levels ranged between 0.2 and 1.19 mg/L and averaged 0.41 mg/L. The low DO levels in the treatment area and in the majority of the wells indicates conditions are favorable for reductive dechlorination.

Oxidation-Reduction Potential

During the Year 2 RA-O event, the ORP ranged between -125 and 253 mV in the Bayou Biobarrier area. In the treatment area, the ORP levels were 83 mV and 101 mV in January 2022 at 16IW20 and 16RW11, respectively. The Year 2 Quarter 4 data from wells in the treatment area are above the -50 mV criteria, suggesting that the groundwater is less anaerobic than it was earlier in the Year 2 RA-O. Outside of the treatment area, the ORP ranged between 30 and 253 mV. The ORP values at the Bayou Biobarrier area indicate that the groundwater is not reducing, which is not favorable for the degradation of site contaminants.

Nitrate

Nitrate levels above 1 mg/L may compete with the reductive pathway (USEPA 1998). The nitrate concentrations were below 1.0 mg/L during the second year of RA-O sampling, indicating that nitrate will not inhibit anaerobic degradation of site COCs.

Sulfate

The sulfate concentrations during the Year 2 RA-O were above 20 mg/L at 16IW20, indicating that sulfate-reducing conditions have not been established in the treatment area.

Outside the treatment area, sulfate ranged from 106 to 7,890 mg/L. Sulfate levels may compete as an electron acceptor with perchlorate and VOCs.

Total Organic Carbon

TOC concentrations were measured in select wells during the Year 2 RA-O sampling events and ranged from 1.14 to 52.4 mg/L. TOC greater than 20 mg/L indicates that carbon concentrations are supportive of reductive dechlorination. At the treatment area well (16IW20), TOC levels fluctuated near 10 mg/L and the concentration was 9.73 mg/L in January 2022. TOC was detected above 20 mg/L at 43 mg/L in January 2022 in the upgradient intermediate zone well 16WW41, outside the influence of the treatment area. The higher TOC level could be attributed to the Mid-Plume Area treatment in the intermediate zone. The TOC levels suggest that there is not a sufficient amount of carbon to support degradation in the shallow groundwater zone in this treatment area.

Alkalinity

Alkalinity levels in the groundwater monitoring wells ranged between 165 and 1,040 mg/L during the Year 2 RA-O events. In January 2022 the alkalinity level at 16IW20 was 361 mg/L, which is only slightly higher than the background well 16WW22 at 214 mg/L. The levels observed in the treatment area compared to the background do not suggest there is an increased rate of microbial activity in the treatment area.

pH

During the Year 2 RA-O event, the pH ranged from 5.87 to 6.58 standard units, with seven out of nine wells showing pH in the optimal range in January 2022. The pH data from wells in the Bayou Barrier indicate that the pH levels in this area are conducive conditions for biodegradation.

Methane

Methane was measured in selected wells for MNA evaluation and ranged from 0.95 J to 2,240 µg/L during the Year 2 RA-O events. Methane was detected at 2,080 µg/L in January 2022 within the treatment area at monitoring well 16IW20, indicating highly reducing conditions may be present within the treatment area.

Geochemical Indicator and MNA Parameter Summary

The qualitative assessment of geochemical indicators during the second annual RA-O event in the Bayou Barrier indicates that current geochemical conditions are not favorable for the biological reduction of VOCs and perchlorate. In this area, only the DO and pH values meet the performance objective at numerous wells within and downgradient of the biobarrier. Although the geochemistry does not suggest that conditions are conducive to biological degradation, the decrease in TCE concentration within the treatment area to below the MCL,

the presence of daughter products cis-1,2-DCE, VC, and ethene suggests that limited biological degradation is occurring, and reinjection is not recommended within the existing biobarrier. As mentioned in **Section 3.1.1.4**, it is likely that the Bayou Biobarrier is not adequately treating the groundwater flowing to the east-southeast from the mid-plume treatment area, and it is recommended that a southward extension of the biobarrier be considered to treat the flow if concentrations remain elevated at 16WW30 and 16WW48.

3.2.5 Mid-Plume Area, Shallow Zone

Six wells (16EW01, 16EW02, 16EW03, 16EW04, 16WW30, and 16WW48) were sampled for field test parameters that are used to aid in determining the geochemical state of groundwater. Three of the six wells (16EW01, 16EW03, and 16WW48) were sampled for MNA parameters, and four wells were sampled for TOC as shown in **Table 2-2**.

Dissolved Oxygen

DO levels in the Year 2 RA-O monitoring event are presented in **Table 2-7** and ranged between 0.11 and 1.88 mg/L, with an average of 0.57 mg/L. In January 2022, DO levels across the site were low, but slightly above 0.5 mg/L, except for treatment area well 16EW03, which was below the criteria at 0.3 mg/L. The data suggest that the Shallow Mid-Plume Area is mildly anaerobic.

Oxidation-Reduction Potential

During the Year 2 RA-O, ORP ranged between -104 and 223 mV. In the treatment zone, ORP levels in January 2022 were measured at 69 mV at 16EW02 and -95 mV at 16EW03, indicating conditions that are favorable for reductive dechlorination at some locations within the treatment area. At 16WW48, closer to the downgradient edge of the treatment area, ORP levels decreased from 168 to 66 mV between April 2021 and January 2022, indicating that groundwater downgradient of the treatment area may be trending towards reducing conditions.

Nitrate

The nitrate concentrations ranged from 0.1 U and 1.66 mg/L. The data indicates that nitrate will not inhibit anaerobic degradation of site COCs.

Sulfate

The sulfate concentration at treatment area well 16EW03 was detected at 1,920 mg/L during the January 2022 sampling event. Although the sulfate levels in the treatment area are elevated, the presence of VC and ethene indicate that complete reductive dechlorination is occurring in this area. Elevated levels of sulfate were also observed at 16EW01, located on the northern edge of the treatment area, at 3,410 mg/L. At the downgradient well 16WW48, sulfate levels were above 20 mg/L during each of the Year 2 RA-O sampling events,

suggesting that sulfate may compete as an electron acceptor with perchlorate and VOCs downgradient of the treatment area.

Total Organic Carbon

TOC concentrations were measured in select wells during the Year 2 RA-O and ranged between 12.1 and 67 mg/L. TOC levels at 16EW03 were detected at 67 and 20.9 mg/L in October 2021 and January 2022, respectively, indicating there is a sufficient amount of carbon in the treatment area to sustain microbial growth. During the January 2022 sampling event, TOC levels were observed below the 20 mg/L criteria at 18.8 mg/L at 16EW01 and at 13.7 mg/L at downgradient well 16WW48. There is a downward trend to the TOC concentrations in 16EW03, and re-injection may be required if this trend continues in the Year 3 RA-O.

Alkalinity

Alkalinity levels measured higher in the treatment area compared to wells outside of this area indicate that there is increased microbial activity. In January 2022, alkalinity levels at 16EW03 were measured at 1,160 mg/L. Alkalinity measured at 16EW01, at the upgradient edge of the treatment area, was 598 mg/L, and the alkalinity was measured at 411 mg/L at downgradient well 16WW48. The data suggest that there is increased microbial activity in the treatment area as would be expected with the injection of carbon and the bioaugmentation culture SDC-9™.

pH

During the Year 2 RA-O event, the pH ranged from 5.45 to 7.09 standard units. In January 2022, the pH levels in all wells were above 6.0 standard units, indicating conducive conditions for biodegradation.

Methane

At 16EW03, located in the treatment area, methane was detected above 500 mg/L during the Year 2 Quarters 1, 2, and 4 RA-O sampling events with a concentration of 574 mg/L in Quarter 4 (January 2022). In the two wells at the upgradient edge and downgradient of the treatment area (16EW01 and 16WW48, respectively) methane levels were 122 mg/L and 2.69 mg/L. The methane data indicate that methanogenic conditions were present in the Mid-Plume treatment area, which is favorable for complete reductive dechlorination.

Geochemical Indicator and MNA Parameter Summary

The qualitative assessment of geochemical indicators measured in the Mid-Plume shallow treatment area during the second annual RA-O in at LHAAP-16 indicates that current geochemical conditions remain favorable for the biological reduction of VOCs and perchlorate in the treatment area. Elevated TOC levels above the performance objective of

20 mg/L were only present at one well (16EW03) in the treatment area, indicating that sufficient carbon source for microbial growth may be limited in extent. The lower DO and ORP levels (below the performance objective of -50 mV), elevated alkalinity, elevated methane and TOC concentrations indicate that reinjection is not required. Continued monitoring will determine if the TOC remains above the performance objective. The decreasing TCE levels and increasing cis-1,2-DCE, VC, and ethene concentrations suggest that complete dechlorination is occurring within the treatment area. However, the primary MNA processes reducing TCE concentrations downgradient of the treatment area may be abiotic, including dilution, dispersion, sorption, and volatilization in some areas.

3.2.6 Mid-Plume Area, Intermediate Zone

Seven wells (16EW05, 16EW06, 16EW07, 16EW08, 16WW29, 16WW49, and 16WW51) were sampled for field test parameters to aid in determining the geochemical state of groundwater. Two of the seven wells, 16EW05 (in the treatment area) and 16WW29 (downgradient), were sampled for MNA parameters and one additional well, 16EW06, was sampled for anions (bromide, nitrate, and sulfate) during the Year 2 RA-O as shown in **Table 2-2**.

Well 16EW05 was only sampled in Quarters 3 and 4 due to residual EVO that formed an obstruction in the well. Due to the residual EVO, VOC samples for 16EW05, 16EW06, and EW07 were diluted in the laboratory and have elevated detection limits higher than the MCL or contaminant levels observed at this site. General chemistry samples at 16EW06 (all Year 2 RA-O sampling events) and 16EW05 (October 2021 only) were collected; however, the sample matrix was very viscous and described by the lab as oil and grease. The samples were analyzed as solids using an alternate method, which makes them unsuitable for comparison to the pre-remedy samples.

Dissolved Oxygen

DO levels in the Year 2 RA-O monitoring events are presented in **Table 2-8** and ranged between 0.02 mg/L and 1.11 mg/L, with an average of 0.40 mg/L. During the January 2022 sampling event, low DO levels (< 0.5 mg/L) were observed at six of the seven wells. The only well above 0.5 mg/L in January 2022 was 16WW51 with a DO measurement of 0.54 mg/L. The Year 2 RA-O DO levels in the intermediate zone Mid-Plume Area are conducive to reductive dechlorination in the treatment area and at the downgradient locations.

Oxidation-Reduction Potential

During the Year 2 RA-O events, the ORP ranged between -261 and 143 mV. At 16EW07, located in the treatment area, ORP levels have been below -50 mV during the RA-O events until October 2021. During the Year 2 RA-O, ORP levels at this well increased from -261 to

14 mV between April 2021 and January 2022. The ORP levels in the downgradient wells have also fluctuated and most wells were above the performance objective of -50 mV during the second year, indicating that the area is not favorable for reductive dechlorination.

Nitrate

The nitrate concentrations continue to be below 1.0 mg/L during the second year RA-O sampling events, indicating that nitrate will not inhibit anaerobic degradation of site COCs. Nitrate data at treatment area well 16EW06 was not used in this evaluation due to the viscous samples that were analyzed as a solid, and therefore, cannot be compared to the groundwater data collected at other wells.

Sulfate

During the Year 2 RA-O, sulfate levels ranged from 3.95 and 1,950 mg/L. During the Year 2 RA-O, the samples collected at 16EW06, located in the treatment area, were viscous and analyzed as a solid, which cannot be compared to the downgradient groundwater data. Sulfate levels higher than 20 mg/L were observed in downgradient wells; however, a significant amount of degradation of the COCs is not expected to occur outside of the treatment area.

Total Organic Carbon

TOC concentrations were measured in select wells during the Year 2 RA-O events and were found to range from 16.8 to 161,000 mg/L. At the downgradient well 16WW29, TOC was observed at 22 mg/L in January 2022, above the 20 mg/L criteria. At 16EW05, located at the northern edge of the treatment area, TOC was measured at 161,000 mg/L; however, the elevated level is most likely due to the residual EVO observed in this well. TOC concentrations were above 20 mg/L in the groundwater at both wells, indicating that there is a sufficient amount of carbon to sustain microbial growth.

Alkalinity

Alkalinity levels higher in the treatment area compared to wells outside of this area indicate that there is increased microbial activity. During the Year 2 RA-O, the sample collected for alkalinity at 16EW06, located in the treatment area, was viscous and analyzed as a solid, which cannot be compared to the downgradient groundwater data. In January 2022, the alkalinity in 16EW05 and downgradient well 16WW29 was detected at 346 and 23.4 mg/L, respectively.

pH

During the Year 2 RA-O, the pH ranged from 4.95 to 6.74 standard units with two out of the seven wells (both downgradient of the treatment zone) having a pH in the optimal range.

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This data indicates the pH levels are not ideal for biodegradation in the treatment area of the Mid-Plume Area intermediate zone.

Methane

During the Year 2 RA-O sampling events, elevated levels of methane were observed in well 16EW05. In January 2022, methane was detected at 6,440 µg/L in well 16EW05, above 500 µg/L, indicating that methanogenic conditions exist within the treatment area. At the downgradient well 16WW29, methane levels were low, ranging from 19.8 to 30.6 mg/L.

Geochemical Indicator and MNA Parameter Summary

The qualitative assessment of geochemical indicators during the second annual RA-O event in intermediate Mid-Plume Area is complicated by the residual EVO present in several of the wells that impacted the ability of the lab to analyze the samples. The available data indicate that current geochemical conditions are favorable for the biological reduction of VOCs and perchlorate in and near the treatment area. The TOC concentrations detected within the treatment zone were well above the performance objective of 20 mg/L. The ORP levels at most wells increased and they were above the performance objective of -50 mV during the second year, indicating that the ORP is currently not conducive for reductive dechlorination. Although the ORP levels have increased within the treatment area during the most recent sampling events, the DO values were less than 0.5 mg/L. The TOC and DO values, along with elevated methane, the presence of biodegradation daughter products, and the mildly reducing groundwater conditions, indicate that the conditions are favorable for biological degradation in the treatment area. Though the ORP performance objective was not met, the low DO and elevated TOC values indicate that no reinjection is necessary based on the Year 2 monitoring data.

3.3 Third Line of Evidence: Microbial Analysis

If the first two lines of evidence for MNA are deemed inadequate or inconclusive, data from the field or microcosm studies will be necessary to establish the third line of evidence for MNA. Dechlorinating bacteria, *Dehalococcoides ethenogenes* (DHC), were analyzed at select wells. DHC populations of 1,000 cells per milliliter (cells/mL) are generally favorable for reductive dechlorination, with populations over 10,000 cells/mL considered to be ideal. Wells sampled for DHC during the Year 2 RA-O are shown in **Table 2-2**. DHC concentrations in each area is discussed in **Sections 3.3.1** through **3.3.6**.

3.3.1 Landfill Biobarrier #1

Two wells were sampled for DHC (16WW25 and 16WW26) during the Year 2 RA-O. Detected DHC concentrations in the Landfill Biobarrier #1 area ranged from 2.9 to 35.7 cells/mL during the Year 2 RA-O sampling events (**Table 2-3**). These low

concentrations indicate some amount of microbial activity; however, the populations detected are not enough for complete reductive dechlorination. To evaluate the microbial population in the treatment area, it is recommended that intermediate well 16WW25 be removed from DHC analysis and replaced with monitoring well 16IW09 during the Year 3 RA-O.

3.3.2 Landfill Biobarrier #2

Two wells (16WW35 and 16WW36) were sampled for DHC during the Year 2 RA-O. DHC concentrations in the Landfill Biobarrier #2 Area ranged from 0.1 to 1,200 cells/mL during the Year 2 RA-O sampling events. Increases in DHC were observed in the downgradient well 16WW36. At 16WW36, DHC levels increased from 620 cells/mL to the highest level observed at the site, 1,200 cells/mL, between April 2021 and January 2022 (**Table 2-4**). To evaluate the microbial population in the treatment area, it is recommended that intermediate well 16WW35 be removed from DHC analysis and replaced with treatment area monitoring well 16IW03 during the Year 3 RA-O.

3.3.3 Landfill Biobarrier #3

One well (16WW55) located outside the treatment area was sampled for DHC during the Year 2 RA-O. DHC at this well was below the detection limit in January 2022. During the Year 1 RA-O, DHC was detected at 3.7×10^5 cells/mL in the biobarrier at 16IW10 in the fourth quarterly RA-O event (**Table 2-5**). To evaluate the microbial population in the treatment area it is recommended that intermediate well 16WW55 be removed from DHC analysis and replaced with monitoring well 16IW10 during the Year 3 RA-O.

3.3.4 Bayou Biobarrier

During the Year 2 RA-O, two shallow Bayou Biobarrier monitoring wells (16WW22 and 16WW56) and one intermediate well (16WW41) were sampled for DHC. Low levels, less than 1,000 cells/mL, were observed during Year 2 RA-O and indicate that that outside of the treatment area, microbial populations are not present at levels able to support complete reductive dechlorination of chlorinated ethenes. During the Year 1 RA-O, DHC was detected in the treatment area at 16IW20 at 55,400 cells/mL in October 2020 and 2,100 cells/mL in January 2021 (**Table 2-6**). To evaluate the microbial population in the treatment area, it is recommended that intermediate well 16WW41 be removed from DHC analysis and replaced with monitoring well 16IW20 during the Year 3 RA-O.

3.3.5 Mid-Plume Area, Shallow Zone

During the Year 2 RA-O, one well (16WW48) was sampled for DHC in the shallow Mid-Plume Area. At this well, the population increased from 25.8 cells/mL in January 2021 (Year 1 Quarter 4) to 563 cells/mL in January 2022 (Year 2 Quarter 4), suggesting that

microbial populations are increasing (**Table 2-7**). During the Year 1 RA-O, a high DHC concentration was observed at 3,600 cells/mL in the treatment area at monitoring well 16EW02 in January 2021, indicating the presence of a population at levels that can support the complete reductive dechlorination of chlorinated ethenes. To evaluate the microbial population in the treatment area in the future, it is recommended that downgradient well 16WW48 be removed from DHC analysis and replaced with monitoring well 16EW02 during the Year 3 RA-O.

3.3.6 Mid-Plume Area, Intermediate Zone

At the downgradient monitoring well (16WW29), low levels of DHC were observed during the Year 2 RA-O, ranging from 19.9 to 43.8 cells/mL (**Table 2-8**). During the first year RA-O, high DHC concentrations were detected at monitoring well 16EW05 at 5,060 cells/mL, indicating the presence of a population at levels that can support the complete reductive dechlorination of chlorinated ethenes. To evaluate the microbial population in the treatment area, it is recommended that intermediate well 16WW29 be removed from DHC analysis and replaced with monitoring well 16IW26 during the Year 3 RA-O.

3.4 Screening for MNA Evaluation

In accordance with Section 4.5.3.2 of the RD (AECOM 2017), a scoring process was conducted using the *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater* (USEPA 1998) to evaluate the potential for anaerobic biodegradation processes to reduce chlorinated ethenes as a mechanism of MNA. The list of 34 wells used in the scoring process was derived from Table 4-18 of the LHAAP-16 RD (AECOM 2017). The list of 34 wells was narrowed to eleven wells that had COC concentrations above cleanup levels and that were sampled for the additional geochemical parameters necessary to derive a meaningful score according to the USEPA criteria. **Table 3-3** includes the most recent concentrations and the score obtained for each monitoring well. Seven out of eleven wells showed “limited evidence of anaerobic biodegradation” based on the USEPA scoring criteria. The remaining four wells showed “inadequate evidence of anaerobic biodegradation” based on the scoring criteria.

Mann-Kendall analysis was conducted for the eleven wells for which the USEPA scoring criteria were calculated, as well as ten additional wells that contained one or more COCs above the MCL/PCL (**Appendix E**). Of the seven wells that showed limited evidence of biodegradation in the USEPA scoring, two wells (16WW16 and 16WW48) showed an increasing trend for TCE. Well 16WW16 showed no trend for perchlorate and well 16WW48 showed a stable trend for perchlorate. Four wells (16WW22, 16WW35, 16WW41, and 16WW55) showed a decreasing or probably decreasing trend for TCE and stable, no trend, or

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decreasing trend for perchlorate. The remaining well (16WW36) showed a decreasing trend for TCE and a probably increasing trend for perchlorate. Of the four wells that showed inadequate evidence of biodegradation in the USEPA scoring, one well (16WW57) showed a probably increasing trend for TCE, two wells (16WW22 and 16WW56) showed a decreasing trend for TCE, while the remaining well (16WW58) showed a stable trend for TCE. None of the wells with inadequate evidence for biodegradation had a definable trend for perchlorate. Of the ten wells that did not have adequate geochemical data to be evaluated using the USEPA criteria, an increasing or probably increasing trend for TCE was detected in three wells (16WW30, 16WW37, and 16WW51), with 16WW37 also showing an increasing trend for perchlorate. Decreasing trends were detected for TCE in three wells (16WW14, 16WW38, and 16WW39) and for perchlorate in one well (16WW39). The remaining four wells had no trend, or a stable trend detected in the Mann-Kendall analysis.

The MNA evaluation of the wells from Table 4-18 of the RD (AECOM 2017) indicates that there was limited or inadequate evidence for anaerobic biological degradation in the wells where scoring was performed and that increasing or probably increasing COC concentration trends were present in 7 of the 21 wells where COCs were present above the MCL/PCL. It is recommended that a contingency remedy be developed for the areas where the evaluation indicated limited or inadequate evidence for anaerobic degradation was present and/or where increasing COC trends were indicated by the Mann-Kendall analysis.

4.0 SUMMARY AND RECOMMENDATIONS

4.1 Summary

The LUCs for LHAAP-16 include a land use restriction prohibiting residential use, a requirement to maintain the integrity of any current or future remedial or monitoring systems, and a groundwater use restriction, which prohibits water well installation for any purpose other than environmental monitoring and testing until COCs in the groundwater and soil allow unrestricted use and unlimited exposure. The annual LUC compliance inspection for the second year RA-O was conducted on October 25, 2021. Noncompliance issues or concerns were not identified during the annual inspection. No change in land use or groundwater use occurred at the site during the second annual RA-O monitoring period.

Mowing at LHAAP-16 was conducted on July 7 and October 12, 2021, during the second year of RA-O.

No damage to bollards, well pads, or protective casings was observed during the 2021/2022 well inspections, and minimal encroachment of weeds or brush on the well pads was observed. Monitoring wells 16WW40 and 16WW42 also showed siltation in excess of 10 percent throughout the Year 2 RA-O monitoring, except for the Year 2 Quarter 2 (July 2021) sampling event at 16WW42. Wells 16WW40 and 16WW42 were redeveloped during the June 2022 Year 3 semiannual sampling event. As approved in the Technical Memorandum for Proposed Revisions to the Monitoring Program at LHAAP-04 and LHAAP-16 (Bhate 2022b), seven monitoring wells will be removed from the Year 3 RA-O monitoring network (16RW012, 16RW11, 16WW14, 16WW12, 16EW05, 16EW06, and 16EW07) because these wells are either redundant and duplicate a nearby monitoring location or are damaged due to biofouling from the injections.

VOCs, perchlorate data, and geochemical and microbial indicators were collected over the course of monitoring to evaluate the effectiveness of the ISB remedy. The first line of evidence evaluated reductions in VOCs and perchlorate concentrations. The second line of evidence evaluated geochemical indicators. The third line of evidence evaluated the microbial populations in the aquifer. The results of the evaluation and the conclusions are summarized below.

An assessment of the first line of evidence indicates that perchlorate and TCE concentrations continue to be reduced after ISB injections, though concentrations remain above cleanup levels in many areas. The monitoring wells located within the treatment areas show COC concentration reductions and geochemical and microbial conditions favorable for reductive dechlorination. The formation of daughter products (cis-1,2-DCE, VC, 1,1-DCE, and ethene)

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indicates that reductive dechlorination is occurring. During the Year 1 RA-O, perchlorate concentrations in the intermediate groundwater decreased to below the PCL in Quarter 4. However, during the Year 2 RA-O, perchlorate was detected but levels remain below those observed during the pre-remedy sampling events. The first line of evidence supports the conclusion that the ISB remedy is effectively reducing concentrations within the treatment areas; however, concentrations have not reduced to below MCL/PCL.

The qualitative assessment of geochemical indicators performed as the second line of evidence indicates that current geochemical conditions are supportive of reductive degradation processes within the treatment areas. Conditions are not conducive for reductive dechlorination downgradient or upgradient of the treatment areas. The presence of degradation products cis-1,2-DCE, and VC in areas with marginally conducive conditions suggests that limited biological degradation is occurring; however, the primary MNA processes reducing COC concentrations in areas downgradient and upgradient of the biobarriers are likely to be abiotic. The following sections summarize the second line of evidence for the TOC and ORP performance objectives for each treatment area.

Landfill Biobarrier #1

As discussed in the summary for **Section 3.2.1**, the TOC levels continue to exceed the performance objective within Landfill Biobarrier #1 at 16IW09. At well 16WW26, located farther downgradient of the treatment area, TOC concentrations averaged 3.9 mg/L between March 2020 and July 2021. The ORP values do not meet the performance objective in Year 2 outside of the treatment area. The ORP values did not meet the performance objective of -50 mV within or outside of the treatment area. Though the ORP levels did not meet the performance objective, the reduced COC concentration (below cleanup levels) and TOC values meeting the performance objectives within the treatment area for multiple quarters of sampling, indicate that no reinjection is needed/recommended based on the Year 2 monitoring data.

Landfill Biobarrier #2

As discussed in the summary for **Section 3.2.2**, the TOC was well over the performance objective within Landfill Biobarrier #2 at 16IW03. During the Year 1 RA-O, TOC in this well dropped significantly in Quarter 4; however, during the Year 2 RA-O, TOC remained above 2,500 mg/L in all four quarters, while ORP values were measured below the performance objective of -50 mV during the first two quarters within the treatment area at 16IW03 but rose above the performance objective in Quarters 3 and 4, indicating that the treatment area is becoming more aerobic. TOC concentrations were also observed above the 20 mg/L criteria in the downgradient well. Based on the elevated TOC values and ORP

levels meeting the performance objective within the treatment area for the first two quarters, no reinjection is recommended based on the Year 2 monitoring data. However, if the ORP remains elevated in the Year 3 RA-O and the TOC concentration drops below the performance objective, reinjections may become necessary in the future.

Landfill Biobarrier #3

As discussed in the summary for **Section 3.2.3**, the TOC continued to exceed the performance objective within Landfill Biobarrier #3 at 16IW10. The ORP values were below the -50 mV performance objective in October 2021 at 16IW10 during the Year 2 RA-O, but above the performance objective during the other three quarters (ranging from -16 mV to -47 mV). Outside of the treatment area, the ORP was above -50 mV in January 2022. Based on the reduction of COCs and ORP values meeting the performance objective during Quarter 3 and only narrowly missing the objective during the other three quarters within the treatment area, the biobarrier treatment is working as designed.

Bayou Biobarrier

As discussed in the summary for **Section 3.2.4**, the TOC level did not exceed the performance objective within the Bayou Biobarrier at 16IW20 during the Year 2 RA-O. The ORP values did not meet the performance objective of -50 mV during all four quarters in Year 2 within the treatment zone at 16IW20. Though the TOC and ORP values did not meet the performance objective, the reduction of COC concentrations to below cleanup levels within the treatment area indicates that biobarrier treatment is working as designed. The TOC and ORP levels did not meet the objectives; however, these wells are not expected to be directly influenced by the injections. Also, the groundwater is currently flowing parallel to the southern portion of the biobarrier, and the barrier may not be effectively intercepting contamination flowing towards the bayou. Additional injections south of the current biobarrier may be prudent to effectively capture contaminated groundwater in the vicinity of 16WW48 that is flowing towards the bayou and is not being captured by the current biobarrier configuration.

Mid-Plume Shallow Zone Treatment Area

As discussed in the summary for **Section 3.2.5**, the TOC levels within Mid-Plume Shallow Zone Treatment Area met the criteria during the Year 2 RA-O at 16EW03. The ORP values also met the performance objective (< -50 mV) at 16EW03. The ORP levels in the groundwater close to the downgradient edge decreased during the Year 2 RA-O, indicating that groundwater may be trending towards reducing conditions. Based on the TOC and ORP values meeting the performance objectives in the injection area, no reinjection is

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recommended based on the Year 2 monitoring data. The groundwater flow direction to the east of the shallow zone Mid-Plume Area is generally to the east-southeast and appears to be flowing cross-gradient to the southern portion of Bayou Biobarrier. If this condition continues, southward extension of the Bayou Biobarrier may be a prudent step to minimize contamination migrating towards the bayou, if COC concentrations remain high at 16WW48.

Mid-Plume Intermediate Zone Treatment Area

As discussed in the summary for **Section 3.2.6**, the TOC exceeds the performance objective at well sampled at the Mid-Plume Intermediate Zone. At the treatment area well, ORP levels were below -50 mV during the Year 2 RA-O events until October 2021, with a slight increase to 14 mV in January 2022. The ORP levels in the downgradient wells were below 50 mV during the Year 2 RA-O, indicating that the area is mildly reducing and favorable for reductive dechlorination.

The third line of evidence evaluates the microbial populations. During the Year 2 RA-O, wells sampled for DHC were not within the treatment areas. At some of the downgradient wells, DHC levels were observed at levels generally favorable for reductive dechlorination; however, it has been recommended that wells within the treatment areas be sampled during the Year 3 RA-O sampling events.

The evaluation of the ISB remedy at LHAAP-16 indicates that reductive degradation processes stimulated by the ISB injections are reducing VOC and perchlorate concentrations in groundwater in the treatment areas. COC concentrations are expected to decrease in the downgradient area, as groundwater flows through the biobarrier/treatment area. The decrease in VOC and perchlorate concentrations upgradient and downgradient of the treatment areas is primarily due to abiotic processes including dispersion, dilution, sorption, and volatilization. Semiannual sampling will continue for the third year of RA-O monitoring in compliance with the RACR (Bhate 2021).

4.2 Year 3 Approved Recommendations

Revisions to the RA-O monitoring network were proposed in the Draft Final Technical Memorandum, Proposed Revisions to LHAAP-04 and LHAAP-16 Remedial Action Operation Groundwater Monitoring Programs (Bhate 2022b) and approved by TCEQ and EPA. The approved revisions to the monitoring network are listed below:

- Remove extraction wells 16EW05, 16EW06, and 16EW07 from the RA-O monitoring network due to biofouling issues post injections. These wells will be replaced in the monitoring network by well 16IW26 for Year 3 and will include a

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new well to be installed beyond Year 3 (see **Section 4.3**) in the intermediate zone between 16EW06 and 16EW07.

- Remove 16RW02 from the RA-O monitoring network because it is clean and redundant. Upgradient well 16RW01 is currently being sampled.
- Replace 16RW11 with 16RW12 because 16RW11 is clean and duplicates the monitoring location 16IW20. Monitoring well 16RW12 will provide an additional monitoring location immediately adjacent to and downgradient of the northern portion of the Bayou Biobarrier.
- Remove 16WW14 from the RA-O monitoring network due to redundancy. There are three upgradient wells currently being monitored.
- Remove 16WW21 from the RA-O monitoring network since it is clean and is located in the upper deep zone.
- Monitoring wells 16WW40 and 16WW42 have greater than 10 percent siltation and were redeveloped during the Year 3 RA-O event in June 2022.

To aid in evaluating DHC populations representative of the groundwater within the treatment areas, the following recommendations were made in the Technical Memorandum (Bhate 2022b) and approved by TCEQ and EPA.

- Landfill Biobarrier #1—Well 16WW25 to be replaced with monitoring well 16IW09.
- Landfill Biobarrier #2—Intermediate well 16WW35 to be replaced with well 16IW03.
- Landfill Biobarrier #3—Intermediate well 16WW55 to be replaced with well 16IW10.
- Bayou Biobarrier—Intermediate well 16WW41 to be replaced with well 16IW20.
- Mid-Plume Area, Shallow Zone—Intermediate well 16WW48 to be replaced with well 16EW02.
- Mid-Plume Area, Intermediate Zone—Intermediate well 16WW29 to be replaced with well 16IW26.

4.3 Recommendations to be Completed Beyond Year 3

The following actions are recommended for completion beyond Year 3 pending award of new contract.

- Install one new well in the intermediate zone between 16EW06 and 16EW07 to replace those locations monitoring the performance of the mid-plume intermediate zone ISB treatment area.
- On the east side of Harrison Bayou, elevated concentrations of the COCs have been detected at 16WW57 and 16WW58. Additional wells on the east side of the bayou are recommended to delineate the intermediate zone contaminant plumes along with a more detailed evaluation of the interaction between the bayou and groundwater in the shallow and intermediate zones.
- The groundwater gradient near the southern end of the Bayou Biobarrier is flowing to the east-southeast, nearly parallel to the barrier instead of crossing it. It is likely that the barrier is not adequately treating the groundwater flowing to the east-southeast from the mid-plume treatment area, and it is suggested that a southward extension of the biobarrier be considered to treat this flow if concentrations remain elevated at 16WW48 and 16WW30.
- Implement contingency remedial actions for MNA wells with inadequate/limited evidence of biodegradation and/or increasing statistical trends (**Section 3.3**).

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Tables

Table 2-1
Groundwater Elevation Data, LHAAP-16

Monitoring Well	Zone	Date	Ground Surface Elevation (ft MSL)	Top of Casing Elevation (ft MSL)	Top of Screen (ft BTOC)	Bottom of Screen (ft BTOC)	Constructed Well Depth (ft BGS)	Measured Well Depth (ft TOC)	Depth to Water (ft TOC)	Groundwater Elevation (ft MSL)	Screened Interval Siltation (%)
16EW01	SHALLOW	3/9/2020	198.43	198.32	30.89	35.89	38.89	39.20	25.15	173.17	None
		7/16/2020	198.43	198.32	30.89	35.89	38.89	39.30	23.60	174.72	None
		10/20/2020	198.43	198.32	30.89	35.89	38.89	39.45	24.30	174.02	None
		1/25/2021	198.43	198.32	30.89	35.89	38.89	39.09	23.23	175.09	None
		4/21/2021	198.43	198.32	30.89	35.89	38.89	39.45	23.00	175.32	None
		7/13/2021	198.43	198.32	30.89	35.89	38.89	38.80	22.52	175.80	None
		10/20/2021	198.43	198.32	30.89	35.89	38.89	39.20	23.83	174.49	None
		1/13/2022	198.43	198.32	30.89	35.89	38.89	39.20	24.00	174.32	None
16EW02	SHALLOW	3/9/2020	196.44	196.19	21.75	26.75	29.75	29.70	21.65	174.54	None
		7/16/2020	196.44	196.19	21.75	26.75	29.75	29.30	21.37	174.82	None
		10/21/2020	196.44	196.19	21.75	26.75	29.75	29.70	21.80	174.39	None
		1/26/2021	196.44	196.19	21.75	26.75	29.75	29.52	21.00	175.19	None
		4/19/2021	196.44	196.19	21.75	26.75	29.75	29.79	20.70	175.49	None
		7/26/2021	196.44	196.19	21.75	26.75	29.75	29.60	20.39	175.80	None
		10/20/2021	196.44	196.19	21.75	26.75	29.75	29.65	21.77	174.42	None
		1/12/2022	196.44	196.19	21.75	26.75	29.75	29.65	21.92	174.27	None
16EW03	SHALLOW	3/25/2020	186.17	185.70	12.53	17.53	20.53	19.30	5.78	179.92	None
		7/28/2020	186.17	185.70	12.53	17.53	20.53	18.25	11.50	174.20	None
		10/22/2020	186.17	185.70	12.53	17.53	20.53	19.30	11.95	173.75	None
		2/2/2021	186.17	185.70	12.53	17.53	20.53	19.50	10.80	174.90	None
		4/21/2021	186.17	185.70	12.53	17.53	20.53	19.30	10.03	175.67	None
		7/22/2021	186.17	185.70	12.53	17.53	20.53	19.50	10.39	175.31	None
		10/20/2021	186.17	185.70	12.53	17.53	20.53	19.50	11.82	173.88	None
		1/27/2022	186.17	185.70	12.53	17.53	20.53	19.40	12.00	173.70	None
16EW04	SHALLOW	3/9/2020	180.71	180.66	13.95	18.95	21.95	19.70	6.00	174.66	None
		7/28/2020	180.71	180.66	13.95	18.95	21.95	19.35	6.55	174.11	None
		10/20/2020	180.71	180.66	13.95	18.95	21.95	19.20	7.10	173.56	None
		2/2/2021	180.71	180.66	13.95	18.95	21.95	19.35	6.00	174.66	None
		4/19/2021	180.71	180.66	13.95	18.95	21.95	19.15	5.00	175.66	None
		7/26/2021	180.71	180.66	13.95	18.95	21.95	19.31	5.62	175.04	None
		10/20/2021	180.71	180.66	13.95	18.95	21.95	19.25	7.60	173.06	None
		1/12/2022	180.71	180.66	13.95	18.95	21.95	19.30	7.53	173.13	None
16EW05	INTERMEDIATE	3/30/2020	198.57	198.00	46.43	51.43	54.43	51.35	4.88	193.12	1.6
		7/16/2020	198.57	198.00	46.43	51.43	54.43	53.88	2.75	195.25	None
		7/28/2021	198.57	198.00	46.43	51.43	54.43		5.22	192.78	
		10/21/2021	198.57	198.00	46.43	51.43	54.43	50.85	1.20	196.80	11.6
		1/27/2022	198.57	198.00	46.43	51.43	54.43	52.03	1.10	196.90	None
16EW06	INTERMEDIATE	3/25/2020	196.34	196.06	49.72	54.72	57.72	55.60	18.30	177.76	None

Table 2-1
Groundwater Elevation Data, LHAAP-16

Monitoring Well	Zone	Date	Ground Surface Elevation (ft MSL)	Top of Casing Elevation (ft MSL)	Top of Screen (ft BTOC)	Bottom of Screen (ft BTOC)	Constructed Well Depth (ft BGS)	Measured Well Depth (ft TOC)	Depth to Water (ft TOC)	Groundwater Elevation (ft MSL)	Screened Interval Siltation (%)
		7/16/2020	196.34	196.06	49.72	54.72	57.72	56.55	19.21	176.85	None
		10/21/2020	196.34	196.06	49.72	54.72	57.72	56.52	22.20	173.86	None
		2/2/2021	196.34	196.06	49.72	54.72	57.72	56.47	19.00	177.06	None
		4/22/2021	196.34	196.06	49.72	54.72	57.72	53.81	16.63	179.43	18.2
		7/27/2021	196.34	196.06	49.72	54.72	57.72	53.64	18.55	177.51	21.6
		10/21/2021	196.34	196.06	49.72	54.72	57.72	53.97	21.17	174.89	15.0
		1/27/2022	196.34	196.06	49.72	54.72	57.72	54.59	20.30	175.76	2.6
16EW07	INTERMEDIATE	3/25/2020	185.41	185.41	41.00	46.00	49.00	46.38	9.10	176.31	None
		7/28/2020	185.41	185.41	41.00	46.00	49.00	45.37	10.10	175.31	12.6
		10/22/2020	185.41	185.41	41.00	46.00	49.00	45.35	10.60	174.81	13.0
		2/2/2021	185.41	185.41	41.00	46.00	49.00	45.30	9.27	176.14	14.0
		4/15/2021	185.41	185.41	41.00	46.00	49.00	45.27	9.03	176.38	14.6
		7/27/2021	185.41	185.41	41.00	46.00	49.00	45.18	8.91	176.50	16.4
		10/21/2021	185.41	185.41	41.00	46.00	49.00	45.62	8.43	176.98	7.6
		1/25/2022	185.41	185.41	41.00	46.00	49.00	45.78	18.33	167.08	4.4
16EW08	INTERMEDIATE	3/25/2020	179.81	179.57	33.76	38.76	41.76	39.62	4.00	175.57	None
		7/28/2020	179.81	179.57	33.76	38.76	41.76	37.95	6.12	173.45	16.2
		10/20/2020	179.81	179.57	33.76	38.76	41.76	38.65	6.90	172.67	2.2
		2/2/2021	179.81	179.57	33.76	38.76	41.76	37.25	4.75	174.82	30.2
		4/19/2021	179.81	179.57	33.76	38.76	41.76	36.95	3.78	175.79	36.2
		7/26/2021	179.81	179.57	33.76	38.76	41.76	36.53	3.45	176.12	44.6
		10/20/2021	179.81	179.57	33.76	38.76	41.76	37.82	9.48	170.09	18.8
		1/12/2022	179.81	179.57	33.76	38.76	41.76	38.10	9.00	170.57	13.2
16IW03	SHALLOW	3/25/2020						20.39	14.45		
		7/28/2020						20.37	14.35		
		10/13/2020						20.35	14.88		
		1/26/2021						25.85	14.22		
		4/20/2021						21.32	13.90		
		7/22/2021						22.46	14.37		
		10/21/2021						25.90	14.70		
		1/27/2022						25.79	15.17		
16IW04	SHALLOW	3/10/2020						28.35	16.05		
16IW09	SHALLOW	3/25/2020	178.08	181.41	11.33	21.33	21.58	22.25	4.88	176.53	None
		7/16/2020	178.08	181.41	11.33	21.33	21.58	21.38	7.10	174.31	None
		10/13/2020	178.08	181.41	11.33	21.33	21.58	22.28	10.15	171.26	None
		1/26/2021	178.08	181.41	11.33	21.33	21.58	22.28	3.90	177.51	None
16IW09	SHALLOW	4/22/2021	178.08	181.41	11.33	21.33	21.58	22.33	5.35	176.06	None
		7/14/2021	178.08	181.41	11.33	21.33	21.58	22.35	7.52	173.89	None

Table 2-1
Groundwater Elevation Data, LHAAP-16

Monitoring Well	Zone	Date	Ground Surface Elevation (ft MSL)	Top of Casing Elevation (ft MSL)	Top of Screen (ft BTOC)	Bottom of Screen (ft BTOC)	Constructed Well Depth (ft BGS)	Measured Well Depth (ft TOC)	Depth to Water (ft TOC)	Groundwater Elevation (ft MSL)	Screened Interval Siltation (%)
		10/20/2021	178.08	181.41	11.33	21.33	21.58	22.45	12.72	168.69	None
		1/25/2022	178.08	181.41	11.33	21.33	21.58	22.38	12.23	169.18	None
16IW10	SHALLOW	3/25/2020	192.69	195.90	18.21	28.21	28.71	28.50	21.60	174.30	None
		7/14/2020	192.69	195.90	18.21	28.21	28.71	28.45	21.40	174.50	None
		10/13/2020	192.69	195.90	18.21	28.21	28.71	28.47	21.77	174.13	None
		1/26/2021	192.69	195.90	18.21	28.21	28.71	28.44	21.12	174.78	None
		4/21/2021	192.69	195.90	18.21	28.21	28.71	28.47	20.65	175.25	None
		7/22/2021	192.69	195.90	18.21	28.21	28.71	28.45	20.35	175.55	None
		10/20/2021	192.69	195.90	18.21	28.21	28.71	28.42	21.25	174.65	None
		1/25/2022	192.69	195.90	18.21	28.21	28.71	28.42	21.87	174.03	None
16IW20	SHALLOW	3/9/2020	186.03	188.94	14.91	24.91	25.41	25.48	16.07	172.87	None
		7/21/2020	186.03	188.94	14.91	24.91	25.41	25.35	16.38	172.56	None
		10/21/2020	186.03	188.94	14.91	24.91	25.41	25.47	17.17	171.77	None
		1/27/2021	186.03	188.94	14.91	24.91	25.41	25.46	15.78	173.16	None
		4/21/2021	186.03	188.94	14.91	24.91	25.41	25.47	15.63	173.31	None
		7/22/2021	186.03	188.94	14.91	24.91	25.41	25.33	15.83	173.11	None
		10/21/2021	186.03	188.94	14.91	24.91	25.41	25.45	17.22	171.72	None
		1/25/2022	186.03	188.94	14.91	24.91	25.41	25.45	17.37	171.57	None
16PM02	SHALLOW	3/17/2020	188	191.10	18.10	28.10	31.10	28.42	16.20	174.90	None
		7/20/2020	188	191.10	18.10	28.10	31.10	28.40	16.22	174.88	None
		10/26/2020	188	191.10	18.10	28.10	31.10	28.40	16.65	174.45	None
		1/22/2021	188	191.10	18.10	28.10	31.10	28.39	15.54	175.56	None
		4/14/2021	188	191.10	18.10	28.10	31.10	28.40	15.71	175.39	None
		7/13/2021	188	191.10	18.10	28.10	31.10	28.40	14.83	176.27	None
		10/25/2021	188	191.10	18.10	28.10	31.10	28.38	16.00	175.10	None
		1/24/2022	188	191.10	18.10	28.10	31.10	28.39	16.11	174.99	None
16PM03	SHALLOW	3/17/2020	187.5	190.40	17.90	27.40	27.90	28.48	16.20	174.20	None
		7/20/2020	187.5	190.40	17.90	27.40	27.90	28.48	15.05	175.35	None
		10/26/2020	187.5	190.40	17.90	27.40	27.90	28.45	15.95	174.45	None
		1/22/2021	187.5	190.40	17.90	27.40	27.90	28.41	15.00	175.40	None
		4/14/2021	187.5	190.40	17.90	27.40	27.90	28.40	15.03	175.37	None
		7/13/2021	187.5	190.40	17.90	27.40	27.90	28.42	14.05	176.35	None
		10/25/2021	187.5	190.40	17.90	27.40	27.90	28.41	15.35	175.05	None
		1/24/2022	187.5	190.40	17.90	27.40	27.90	28.43	15.55	174.85	None

Table 2-1
Groundwater Elevation Data, LHAAP-16

Monitoring Well	Zone	Date	Ground Surface Elevation (ft MSL)	Top of Casing Elevation (ft MSL)	Top of Screen (ft BTOC)	Bottom of Screen (ft BTOC)	Constructed Well Depth (ft BGS)	Measured Well Depth (ft TOC)	Depth to Water (ft TOC)	Groundwater Elevation (ft MSL)	Screened Interval Siltation (%)
16PM06	SHALLOW	3/10/2020	186.4	189.60	18.20	28.20	31.20	27.50	15.73	173.87	7.0
		7/20/2020	186.4	189.60	18.20	28.20	31.20	27.40	15.05	174.55	8.0
		10/26/2020	186.4	189.60	18.20	28.20	31.20	27.85	15.55	174.05	3.5
		2/2/2021	186.4	189.60	18.20	28.20	31.20	27.60	14.95	174.65	6.0
		4/13/2021	186.4	189.60	18.20	28.20	31.20	27.47	14.28	175.32	7.3
		7/13/2021	186.4	189.60	18.20	28.20	31.20	27.45	14.08	175.52	7.5
		10/26/2021	186.4	189.60	18.20	28.20	31.20	27.52	14.55	175.05	6.8
		1/24/2022	186.4	189.60	18.20	28.20	31.20	27.57	14.90	174.70	6.3
16PM09	SHALLOW	3/10/2020	185.5	188.30	16.80	26.80	27.80	27.18	13.92	174.38	None
		7/20/2020	185.5	188.30	16.80	26.80	27.80	27.20	13.38	174.92	None
		10/26/2020	185.5	188.30	16.80	26.80	27.80	27.10	14.05	174.25	None
		1/22/2021	185.5	188.30	16.80	26.80	27.80	26.97	12.73	175.57	None
		4/13/2021	185.5	188.30	16.80	26.80	27.80	27.11	13.27	175.03	None
		7/22/2021	185.5	188.30	16.80	26.80	27.80	27.10	12.72	175.58	None
		10/26/2021	185.5	188.30	16.80	26.80	27.80	27.12	13.20	175.10	None
		1/24/2022	185.5	188.30	16.80	26.80	27.80	27.08	13.37	174.93	None
16PM14	SHALLOW	3/10/2020	188.2	191.20	18.00	28.00	31.00	28.20	17.20	174.00	None
		7/20/2020	188.2	191.20	18.00	28.00	31.00	28.20	16.42	174.78	None
		10/26/2020	188.2	191.20	18.00	28.00	31.00	28.22	17.10	174.10	None
		2/2/2021	188.2	191.20	18.00	28.00	31.00	28.20	16.56	174.64	None
		4/13/2021	188.2	191.20	18.00	28.00	31.00	28.22	16.17	175.03	None
		7/22/2021	188.2	191.20	18.00	28.00	31.00	28.00	15.18	176.02	0.0
		10/26/2021	188.2	191.20	18.00	28.00	31.00	28.20	16.20	175.00	None
		1/24/2022	188.2	191.20	18.00	28.00	31.00	28.19	16.45	174.75	None
16RW01	SHALLOW	3/12/2020	186.56	189.77	18.21	28.21	28.51	28.21	16.03	173.74	0.0
		7/27/2020	186.56	189.77	18.21	28.21	28.51	28.38	16.18	173.59	None
		10/20/2020	186.56	189.77	18.21	28.21	28.51	28.21	16.85	172.92	0.0
		1/22/2021	186.56	189.77	18.21	28.21	28.51	28.37	15.76	174.01	None
		4/14/2021	186.56	189.77	18.21	28.21	28.51	28.21	15.32	174.45	0.0
		7/26/2021	186.56	189.77	18.21	28.21	28.51	28.38	15.04	174.73	None
		10/26/2021	186.56	189.77	18.21	28.21	28.51	28.18	16.92	172.85	0.3
		1/24/2022	186.56	189.77	18.21	28.21	28.51	28.37	17.00	172.77	None
16RW02	SHALLOW	3/12/2020	179.94	182.97	11.03	21.03	21.03	21.50	6.31	176.66	None
		7/21/2020	179.94	182.97	11.03	21.03	21.03	21.50	9.20	173.77	None
		10/22/2020	179.94	182.97	11.03	21.03	21.03	21.50	11.82	171.15	None
		1/22/2021	179.94	182.97	11.03	21.03	21.03	21.48	4.63	178.34	None
		4/14/2021	179.94	182.97	11.03	21.03	21.03	21.50	6.20	176.77	None
16RW02	SHALLOW	7/26/2021	179.94	182.97	11.03	21.03	21.03	21.52	8.95	174.02	None

Table 2-1
Groundwater Elevation Data, LHAAP-16

Monitoring Well	Zone	Date	Ground Surface Elevation (ft MSL)	Top of Casing Elevation (ft MSL)	Top of Screen (ft BTOC)	Bottom of Screen (ft BTOC)	Constructed Well Depth (ft BGS)	Measured Well Depth (ft TOC)	Depth to Water (ft TOC)	Groundwater Elevation (ft MSL)	Screened Interval Siltation (%)
		10/13/2021	179.94	182.97	11.03	21.03	21.03	21.49	13.00	169.97	None
		1/24/2022	179.94	182.97	11.03	21.03	21.03	21.47	13.16	169.81	None
16RW03	SHALLOW	3/9/2020	178.32	181.66	13.34	23.34	23.34	23.08	4.77	176.89	2.6
16RW04	SHALLOW	3/9/2020	188.04	190.94	16.90	26.90	27.20	27.65	17.50	173.44	None
		7/28/2020	188.04	190.94	16.90	26.90	27.20	27.63	17.42	173.52	None
		10/21/2020	188.04	190.94	16.90	26.90	27.20	27.62	18.32	172.62	None
		1/28/2021	188.04	190.94	16.90	26.90	27.20	27.62	17.03	173.91	None
		4/14/2021	188.04	190.94	16.90	26.90	27.20	27.62	16.33	174.61	None
		7/26/2021	188.04	190.94	16.90	26.90	27.20	27.63	16.59	174.35	None
		10/20/2021	188.04	190.94	16.90	26.90	27.20	27.62	18.62	172.32	None
		1/24/2022	188.04	190.94	16.90	26.90	27.20	27.62	18.35	172.59	None
16RW05	SHALLOW	3/12/2020	177.61	180.70	13.09	23.09	23.09	23.40	4.79	175.91	None
		7/16/2020	177.61	180.70	13.09	23.09	23.09	23.22	6.18	174.52	None
		10/22/2020	177.61	180.70	13.09	23.09	23.09	23.40	10.05	170.65	None
		1/28/2021	177.61	180.70	13.09	23.09	23.09	23.37	4.57	176.13	None
		4/19/2021	177.61	180.70	13.09	23.09	23.09	23.38	4.32	176.38	None
		7/14/2021	177.61	180.70	13.09	23.09	23.09	23.38	7.52	173.18	None
		10/18/2021	177.61	180.70	13.09	23.09	23.09	23.37	13.66	167.04	None
		1/24/2022	177.61	180.70	13.09	23.09	23.09	23.38	12.05	168.65	None
16RW06	SHALLOW	3/17/2020	194.35	197.37	18.52	28.52	29.02	29.25	23.30	174.07	None
		7/14/2020	194.35	197.37	18.52	28.52	29.02	29.25	22.72	174.65	None
		10/26/2020	194.35	197.37	18.52	28.52	29.02	23.95	23.15	174.22	45.7
		1/22/2021	194.35	197.37	18.52	28.52	29.02	29.23	22.65	174.72	None
		4/19/2021	194.35	197.37	18.52	28.52	29.02	29.24	22.10	175.27	None
		7/27/2021	194.35	197.37	18.52	28.52	29.02	29.25	21.73	175.64	None
		10/25/2021	194.35	197.37	18.52	28.52	29.02	29.23	23.93	173.44	None
		1/25/2022	194.35	197.37	18.52	28.52	29.02	28.25	23.28	174.09	2.7
16RW07	SHALLOW	3/17/2020	192.20	195.48	18.28	28.28	28.78	28.41	21.15	174.33	None
		7/14/2020	192.20	195.48	18.28	28.28	28.78	28.45	19.68	175.80	None
		10/26/2020	192.20	195.48	18.28	28.28	28.78	28.42	21.12	174.36	None
		1/22/2021	192.20	195.48	18.28	28.28	28.78	28.77	20.58	174.90	None
		4/19/2021	192.20	195.48	18.28	28.28	28.78	28.20	20.05	175.43	0.8
		7/27/2021	192.20	195.48	18.28	28.28	28.78	28.47	19.75	175.73	None
		10/28/2021	192.20	195.48	18.28	28.28	28.78	28.45	20.90	174.58	None
		1/25/2022	192.20	195.48	18.28	28.28	28.78	28.43	21.25	174.23	None
16RW08	SHALLOW	3/11/2020	193.62	196.37	19.25	29.25	29.75	30.45	22.22	174.15	None
16RW09	SHALLOW	3/11/2020	195.14	197.81	19.67	29.67	30.17	30.65	24.93	172.88	None
		7/14/2020	195.14	197.81	19.67	29.67	30.17	30.62	23.37	174.44	None

Table 2-1
Groundwater Elevation Data, LHAAP-16

Monitoring Well	Zone	Date	Ground Surface Elevation (ft MSL)	Top of Casing Elevation (ft MSL)	Top of Screen (ft BTOC)	Bottom of Screen (ft BTOC)	Constructed Well Depth (ft BGS)	Measured Well Depth (ft TOC)	Depth to Water (ft TOC)	Groundwater Elevation (ft MSL)	Screened Interval Siltation (%)
		10/26/2020	195.14	197.81	19.67	29.67	30.17	30.62	24.00	173.81	None
		2/2/2021	195.14	197.81	19.67	29.67	30.17	30.63	23.33	174.48	None
		4/20/2021	195.14	197.81	19.67	29.67	30.17	30.63	22.68	175.13	None
		7/27/2021	195.14	197.81	19.67	29.67	30.17	30.47	22.47	175.34	None
		10/26/2021	195.14	197.81	19.67	29.67	30.17	30.63	23.65	174.16	None
		1/26/2022	195.14	197.81	19.67	29.67	30.17	30.63	24.10	173.71	None
16RW10	SHALLOW	3/11/2020	192.27	195.25	17.98	27.98	28.48	28.22	14.83	180.42	None
		7/20/2020	192.27	195.25	17.98	27.98	28.48	28.20	20.62	174.63	None
		10/26/2020	192.27	195.25	17.98	27.98	28.48	28.20	22.23	173.02	None
		2/2/2021	192.27	195.25	17.98	27.98	28.48	28.20	20.65	174.60	None
		4/20/2021	192.27	195.25	17.98	27.98	28.48	28.18	20.09	175.16	None
		7/27/2021	192.27	195.25	17.98	27.98	28.48	28.20	19.86	175.39	None
		10/26/2021	192.27	195.25	17.98	27.98	28.48	28.17	20.94	174.31	None
		1/26/2022	192.27	195.25	17.98	27.98	28.48	28.18	21.80	173.45	None
16RW11	SHALLOW	3/17/2020	187.46	189.95	14.49	24.49	24.99	25.61	17.23	172.72	None
		7/21/2020	187.46	189.95	14.49	24.49	24.99	25.65	17.30	172.65	None
		10/21/2020	187.46	189.95	14.49	24.49	24.99	25.27	17.91	172.04	None
		2/3/2021	187.46	189.95	14.49	24.49	24.99	25.28	16.93	173.02	None
		4/21/2021	187.46	189.95	14.49	24.49	24.99	25.62	16.47	173.48	None
		7/22/2021	187.46	189.95	14.49	24.49	24.99	25.25	16.57	173.38	None
		10/21/2021	187.46	189.95	14.49	24.49	24.99	25.28	18.26	171.69	None
		1/26/2022	187.46	189.95	14.49	24.49	24.99	25.60	18.31	171.64	None
16RW12	SHALLOW	3/10/2020	193.23	196.22	21.49	31.49	31.99	32.20	23.20	173.02	None
16WW12	SHALLOW	3/11/2020	186.17	188.81	16.64	26.64	26.64	27.00	15.78	173.03	None
		7/21/2020	186.17	188.81	16.64	26.64	26.64	26.98	16.15	172.66	None
		10/21/2020	186.17	188.81	16.64	26.64	26.64	26.97	16.77	172.04	None
		2/3/2021	186.17	188.81	16.64	26.64	26.64	27.00	15.69	173.12	None
		4/21/2021	186.17	188.81	16.64	26.64	26.64	27.00	15.05	173.76	None
		7/28/2021	186.17	188.81	16.64	26.64	26.64	27.00	15.65	173.16	None
		10/21/2021	186.17	188.81	16.64	26.64	26.64	27.01	17.00	171.81	None
		1/26/2022	186.17	188.81	16.64	26.64	26.64	27.00	17.08	171.73	None
16WW13	INTERMEDIATE	3/12/2020	175.74	178.47	16.73	26.73	26.73	22.90	3.67	174.80	38.3
		7/23/2020	175.74	178.47	16.73	26.73	26.73	22.90	5.70	172.77	38.3
		10/22/2020	175.74	178.47	16.73	26.73	26.73	25.90	7.00	171.47	8.3
		1/22/2021	175.74	178.47	16.73	26.73	26.73	22.87	2.86	175.61	38.6
16WW13	INTERMEDIATE	4/19/2021	175.74	178.47	16.73	26.73	26.73	24.85	3.03	175.44	18.8
		7/26/2021	175.74	178.47	16.73	26.73	26.73	24.90	5.10	173.37	18.3
		10/26/2021	175.74	178.47	16.73	26.73	26.73	23.90	8.92	169.55	28.3

Table 2-1
Groundwater Elevation Data, LHAAP-16

Monitoring Well	Zone	Date	Ground Surface Elevation (ft MSL)	Top of Casing Elevation (ft MSL)	Top of Screen (ft BTOC)	Bottom of Screen (ft BTOC)	Constructed Well Depth (ft BGS)	Measured Well Depth (ft TOC)	Depth to Water (ft TOC)	Groundwater Elevation (ft MSL)	Screened Interval Siltation (%)
		1/27/2022	175.74	178.47	16.73	26.73	26.73	24.88	8.03	170.44	18.5
16WW14	SHALLOW	3/24/2020	195.24	198.87	20.63	30.63	32.63	30.47	24.42	174.45	1.6
		7/20/2020	195.24	198.87	20.63	30.63	32.63	30.25	23.78	175.09	3.8
		10/19/2020	195.24	198.87	20.63	30.63	32.63	30.25	24.05	174.82	3.8
		1/22/2021	195.24	198.87	20.63	30.63	32.63	29.23	23.71	175.16	14.0
		4/12/2021	195.24	198.87	20.63	30.63	32.63	30.25	23.23	175.64	3.8
		7/12/2021	195.24	198.87	20.63	30.63	32.63	30.25	22.72	176.15	3.8
		10/25/2021	195.24	198.87	20.63	30.63	32.63	30.25	23.96	174.91	3.8
		1/10/2022	195.24	198.87	20.63	30.63	32.63	30.23	24.44	174.43	4.0
16WW16	SHALLOW	3/11/2020	193.02	195.64	21.62	31.62	31.62	31.54	20.78	174.86	0.8
		7/14/2020	193.02	195.64	21.62	31.62	31.62	31.55	20.40	175.24	0.7
		10/8/2020	193.02	195.64	21.62	31.62	31.62	31.55	20.68	174.96	0.7
		1/20/2021	193.02	195.64	21.62	31.62	31.62	31.52	20.47	175.17	1.0
		4/15/2021	193.02	195.64	21.62	31.62	31.62	31.55	19.90	175.74	0.7
		7/20/2021	193.02	195.64	21.62	31.62	31.62	31.60	19.39	176.25	0.2
		10/13/2021	193.02	195.64	21.62	31.62	31.62	31.54	20.38	175.26	0.8
		1/11/2022	193.02	195.64	21.62	31.62	31.62	31.57	20.92	174.72	0.5
16WW21	UPPER DEEP	3/16/2020	194.85	198.06	93.21	103.21	103.21	103.21	23.92	174.14	0.0
		7/15/2020	194.85	198.06	93.21	103.21	103.21	103.52	23.62	174.44	None
		10/14/2020	194.85	198.06	93.21	103.21	103.21	103.52	24.35	173.71	None
		2/3/2021	194.85	198.06	93.21	103.21	103.21	103.52	23.51	174.55	None
		4/15/2021	194.85	198.06	93.21	103.21	103.21	103.51	22.85	175.21	None
		7/20/2021	194.85	198.06	93.21	103.21	103.21	103.15	22.76	175.30	0.6
		10/19/2021	194.85	198.06	93.21	103.21	103.21	103.33	24.16	173.90	None
		1/13/2022	194.85	198.06	93.21	103.21	103.21	103.25	24.70	173.36	None
16WW22	SHALLOW	3/16/2020	197.19	200.13	23.94	33.94	33.94	34.30	26.50	173.63	None
		7/15/2020	197.19	200.13	23.94	33.94	33.94	34.30	25.90	174.23	None
		10/14/2020	197.19	200.13	23.94	33.94	33.94	34.30	26.65	173.48	None
		1/25/2021	197.19	200.13	23.94	33.94	33.94	34.28	25.94	174.19	None
		4/15/2021	197.19	200.13	23.94	33.94	33.94	34.30	25.51	174.62	None
		7/20/2021	197.19	200.13	23.94	33.94	33.94	34.30	25.40	174.73	None
		10/19/2021	197.19	200.13	23.94	33.94	33.94	34.30	26.63	173.50	None
		1/11/2022	197.19	200.13	23.94	33.94	33.94	34.32	27.00	173.13	None

Table 2-1
Groundwater Elevation Data, LHAAP-16

Monitoring Well	Zone	Date	Ground Surface Elevation (ft MSL)	Top of Casing Elevation (ft MSL)	Top of Screen (ft BTOC)	Bottom of Screen (ft BTOC)	Constructed Well Depth (ft BGS)	Measured Well Depth (ft TOC)	Depth to Water (ft TOC)	Groundwater Elevation (ft MSL)	Screened Interval Siltation (%)
16WW23	INTERMEDIATE	3/31/2020	174.78	177.98	27.20	37.20	37.20	39.17	3.95	174.03	None
		7/27/2020	174.78	177.98	27.20	37.20	37.20	37.17	35.58	142.40	0.3
		10/8/2020	174.78	177.98	27.20	37.20	37.20	37.15	6.45	171.53	0.5
		1/28/2021	174.78	177.98	27.20	37.20	37.20	37.15	4.10	173.88	0.5
		4/22/2021	174.78	177.98	27.20	37.20	37.20	37.17	3.92	174.06	0.3
		7/14/2021	174.78	177.98	27.20	37.20	37.20	37.15	5.29	172.69	0.5
		10/13/2021	174.78	177.98	27.20	37.20	37.20	37.63	7.63	170.35	None
		1/27/2022	174.78	177.98	27.20	37.20	37.20	37.15	7.16	170.82	0.5
16WW24	SHALLOW	3/31/2020	174.66	177.95	14.29	19.29	19.29	19.20	3.28	174.67	1.8
		7/27/2020	174.66	177.95	14.29	19.29	19.29	19.25	6.00	171.95	0.8
		10/8/2020	174.66	177.95	14.29	19.29	19.29	19.33	7.22	170.73	None
		1/28/2021	174.66	177.95	14.29	19.29	19.29	19.23	3.52	174.43	1.2
		4/22/2021	174.66	177.95	14.29	19.29	19.29	19.23	3.58	174.37	1.2
		7/14/2021	174.66	177.95	14.29	19.29	19.29	19.25	6.27	171.68	0.8
		10/13/2021	174.66	177.95	14.29	19.29	19.29	19.23	9.79	168.16	1.2
		1/27/2022	174.66	177.95	14.29	19.29	19.29	19.23	9.25	168.70	1.2
16WW25	INTERMEDIATE	3/16/2020	185.52	188.77	42.25	52.25	52.25	52.50	15.20	173.57	None
		7/21/2020	185.52	188.77	42.25	52.25	52.25	52.52	16.75	172.02	None
		10/14/2020	185.52	188.77	42.25	52.25	52.25	52.52	16.38	172.39	None
		1/21/2021	185.52	188.77	42.25	52.25	52.25	52.51	14.50	174.27	None
		4/20/2021	185.52	188.77	42.25	52.25	52.25	52.52	14.36	174.41	None
		7/13/2021	185.52	188.77	42.25	52.25	52.25	52.52	15.45	173.32	None
		10/14/2021	185.52	188.77	42.25	52.25	52.25	52.52	17.75	171.02	None
		1/12/2022	185.52	188.77	42.25	52.25	52.25	52.55	17.44	171.33	None
16WW26	SHALLOW	3/9/2020	185.36	188.83	15.97	20.97	20.97	21.85	14.84	173.99	None
		7/21/2020	185.36	188.83	15.97	20.97	20.97	21.80	14.90	173.93	None
		10/14/2020	185.36	188.83	15.97	20.97	20.97	21.80	15.92	172.91	None
		1/21/2021	185.36	188.83	15.97	20.97	20.97	21.78	14.58	174.25	None
		4/20/2021	185.36	188.83	15.97	20.97	20.97	21.79	13.05	175.78	None
		7/13/2021	185.36	188.83	15.97	20.97	20.97	21.80	14.12	174.71	None
		10/14/2021	185.36	188.83	15.97	20.97	20.97	21.80	16.17	172.66	None
		1/12/2022	185.36	188.83	15.97	20.97	20.97	21.80	16.03	172.80	None
16WW27	INTERMEDIATE	3/12/2020	174.21	177.31	29.10	39.10	39.10	39.31	4.30	173.01	None
		7/23/2020	174.21	177.31	29.10	39.10	39.10	39.32	5.31	172.00	None
		10/22/2020	174.21	177.31	29.10	39.10	39.10	39.35	6.55	170.76	None
		1/28/2021	174.21	177.31	29.10	39.10	39.10	39.29	4.00	173.31	None
		4/22/2021	174.21	177.31	29.10	39.10	39.10	39.30	3.98	173.33	None
16WW27	INTERMEDIATE	7/28/2021	174.21	177.31	29.10	39.10	39.10	39.30	4.86	172.45	None

Table 2-1
Groundwater Elevation Data, LHAAP-16

Monitoring Well	Zone	Date	Ground Surface Elevation (ft MSL)	Top of Casing Elevation (ft MSL)	Top of Screen (ft BTOC)	Bottom of Screen (ft BTOC)	Constructed Well Depth (ft BGS)	Measured Well Depth (ft TOC)	Depth to Water (ft TOC)	Groundwater Elevation (ft MSL)	Screened Interval Siltation (%)
		10/18/2021	174.21	177.31	29.10	39.10	39.10	39.32	7.72	169.59	None
		1/25/2022	174.21	177.31	29.10	39.10	39.10	39.32	7.10	170.21	None
16WW29	INTERMEDIATE	3/30/2020	175.16	178.24	40.08	45.08	45.08	45.00	4.53	173.71	1.6
		7/15/2020	175.16	178.24	40.08	45.08	45.08	45.00	5.19	173.05	1.6
		10/14/2020	175.16	178.24	40.08	45.08	45.08	45.00	6.27	171.97	1.6
		1/21/2021	175.16	178.24	40.08	45.08	45.08	44.98	4.34	173.90	2.0
		4/20/2021	175.16	178.24	40.08	45.08	45.08	45.00	4.20	174.04	1.6
		7/20/2021	175.16	178.24	40.08	45.08	45.08	45.00	4.65	173.59	1.6
		10/14/2021	175.16	178.24	40.08	45.08	45.08	45.02	7.40	170.84	1.2
		1/12/2022	175.16	178.24	40.08	45.08	45.08	45.00	7.11	171.13	1.6
16WW30	SHALLOW	3/30/2020	175.33	178.47	28.14	33.14	33.14	33.00	4.75	173.72	2.8
		7/15/2020	175.33	178.47	28.14	33.14	33.14	33.00	5.41	173.06	2.8
		10/14/2020	175.33	178.47	28.14	33.14	33.14	33.00	6.77	171.70	2.8
		1/21/2021	175.33	178.47	28.14	33.14	33.14	32.98	4.58	173.89	3.2
		4/20/2021	175.33	178.47	28.14	33.14	33.14	33.00	4.52	173.95	2.8
		7/20/2021	175.33	178.47	28.14	33.14	33.14	33.00	4.88	173.59	2.8
		10/14/2021	175.33	178.47	28.14	33.14	33.14	33.02	7.77	170.70	2.4
		1/12/2022	175.33	178.47	28.14	33.14	33.14	33.02	7.55	170.92	2.4
16WW31	INTERMEDIATE	3/12/2020	200.00	202.78	41.78	51.78	51.78	51.82	28.63	174.15	None
		7/27/2020	200.00	202.78	41.78	51.78	51.78	51.80	28.38	174.40	None
		10/19/2020	200.00	202.78	41.78	51.78	51.78	51.80	29.00	173.78	None
		1/19/2021	200.00	202.78	41.78	51.78	51.78	51.81	28.46	174.32	None
		4/12/2021	200.00	202.78	41.78	51.78	51.78	51.81	27.75	175.03	None
		7/12/2021	200.00	202.78	41.78	51.78	51.78	51.80	27.40	175.38	None
		10/18/2021	200.00	202.78	41.78	51.78	51.78	51.90	28.65	174.13	None
		1/11/2022	200.00	202.78	41.78	51.78	51.78	51.82	29.22	173.56	None
16WW32	SHALLOW	3/12/2020	199.85	202.86	25.01	35.01	35.01	35.00	28.65	174.21	0.1
		7/27/2020	199.85	202.86	25.01	35.01	35.01	35.00	23.38	179.48	0.1
		10/19/2020	199.85	202.86	25.01	35.01	35.01	35.01	29.02	173.84	0.0
		1/19/2021	199.85	202.86	25.01	35.01	35.01	34.98	28.58	174.28	0.3
		4/12/2021	199.85	202.86	25.01	35.01	35.01	35.01	27.81	175.05	0.0
		7/12/2021	199.85	202.86	25.01	35.01	35.01	35.00	27.43	175.43	0.1
		10/18/2021	199.85	202.86	25.01	35.01	35.01	35.00	28.44	174.42	0.1
		1/10/2022	199.85	202.86	25.01	35.01	35.01	35.01	29.29	173.57	0.0
16WW33	INTERMEDIATE	3/12/2020	199.92	203.09	42.17	52.17	52.17	52.00	28.81	174.28	1.7
		7/23/2020	199.92	203.09	42.17	52.17	52.17	52.00	28.27	174.82	1.7
16WW33	INTERMEDIATE	10/19/2020	199.92	203.09	42.17	52.17	52.17	51.95	28.95	174.14	2.2
		2/3/2021	199.92	203.09	42.17	52.17	52.17	52.00	28.25	174.84	1.7

Table 2-1
Groundwater Elevation Data, LHAAP-16

Monitoring Well	Zone	Date	Ground Surface Elevation (ft MSL)	Top of Casing Elevation (ft MSL)	Top of Screen (ft BTOC)	Bottom of Screen (ft BTOC)	Constructed Well Depth (ft BGS)	Measured Well Depth (ft TOC)	Depth to Water (ft TOC)	Groundwater Elevation (ft MSL)	Screened Interval Siltation (%)
		4/12/2021	199.92	203.09	42.17	52.17	52.17	51.97	27.85	175.24	2.0
		7/12/2021	199.92	203.09	42.17	52.17	52.17	51.98	27.42	175.67	1.9
		10/18/2021	199.92	203.09	42.17	52.17	52.17	51.96	28.50	174.59	2.1
		1/10/2022	199.92	203.09	42.17	52.17	52.17	52.02	29.05	174.04	1.5
16WW34	SHALLOW	3/12/2020	200.27	203.08	29.81	34.81	34.81	34.90	28.72	174.36	None
		7/23/2020	200.27	203.08	29.81	34.81	34.81	34.95	28.18	174.90	None
		10/19/2020	200.27	203.08	29.81	34.81	34.81	34.89	28.80	174.28	None
		2/3/2021	200.27	203.08	29.81	34.81	34.81	34.88	28.25	174.83	None
		4/12/2021	200.27	203.08	29.81	34.81	34.81	34.86	27.80	175.28	None
		7/12/2021	200.27	203.08	29.81	34.81	34.81	34.89	27.22	175.86	None
		10/18/2021	200.27	203.08	29.81	34.81	34.81	34.95	28.45	174.63	None
		1/10/2022	200.27	203.08	29.81	34.81	34.81	34.90	29.03	174.05	None
16WW35	INTERMEDIATE	3/11/2020	188.15	191.23	36.58	46.58	46.58	46.55	16.85	174.38	0.3
		7/14/2020	188.15	191.23	36.58	46.58	46.58	46.55	16.55	174.68	0.3
		10/13/2020	188.15	191.23	36.58	46.58	46.58	46.55	16.95	174.28	0.3
		1/20/2021	188.15	191.23	36.58	46.58	46.58	46.53	16.53	174.70	0.5
		4/13/2021	188.15	191.23	36.58	46.58	46.58	46.54	16.00	175.23	0.4
		7/14/2021	188.15	191.23	36.58	46.58	46.58	46.55	15.59	175.64	0.3
		10/13/2021	188.15	191.23	36.58	46.58	46.58	46.55	16.55	174.68	0.3
		1/11/2022	188.15	191.23	36.58	46.58	46.58	46.55	17.05	174.18	0.3
16WW36	SHALLOW	3/11/2020	187.95	190.94	19.49	24.49	24.49	24.78	16.40	174.54	None
		7/14/2020	187.95	190.94	19.49	24.49	24.49	24.85	16.68	174.26	None
		10/13/2020	187.95	190.94	19.49	24.49	24.49	25.90	16.25	174.69	None
		1/20/2021	187.95	190.94	19.49	24.49	24.49	24.85	16.02	174.92	None
		4/13/2021	187.95	190.94	19.49	24.49	24.49	24.86	15.45	175.49	None
		7/14/2021	187.95	190.94	19.49	24.49	24.49	24.87	15.04	175.90	None
		10/13/2021	187.95	190.94	19.49	24.49	24.49	24.87	16.07	174.87	None
		1/11/2022	187.95	190.94	19.49	24.49	24.49	24.87	16.53	174.41	None
16WW37	INTERMEDIATE	3/17/2020	198.75	201.97	43.72	48.72	48.72	47.93	26.93	175.04	15.8
		7/23/2020	198.75	201.97	43.72	48.72	48.72	47.95	26.20	175.77	15.4
		10/19/2020	198.75	201.97	43.72	48.72	48.72	48.22	26.80	175.17	10.0
		1/20/2021	198.75	201.97	43.72	48.72	48.72	47.92	26.41	175.56	16.0
		4/12/2021	198.75	201.97	43.72	48.72	48.72	47.93	25.78	176.19	15.8
		7/12/2021	198.75	201.97	43.72	48.72	48.72	47.90	25.08	176.89	16.4
		10/25/2021	198.75	201.97	43.72	48.72	48.72	47.93	26.53	175.44	15.8
		1/10/2022	198.75	201.97	43.72	48.72	48.72	48.09	27.00	174.97	12.6
16WW38	SHALLOW	3/17/2020	198.62	201.92	22.30	32.30	32.30	32.27	26.80	175.12	0.3
		7/23/2020	198.62	201.92	22.30	32.30	32.30	32.30	26.30	175.62	0.0

Table 2-1
Groundwater Elevation Data, LHAAP-16

Monitoring Well	Zone	Date	Ground Surface Elevation (ft MSL)	Top of Casing Elevation (ft MSL)	Top of Screen (ft BTOC)	Bottom of Screen (ft BTOC)	Constructed Well Depth (ft BGS)	Measured Well Depth (ft TOC)	Depth to Water (ft TOC)	Groundwater Elevation (ft MSL)	Screened Interval Siltation (%)
		10/19/2020	198.62	201.92	22.30	32.30	32.30	32.27	26.63	175.29	0.3
		1/20/2021	198.62	201.92	22.30	32.30	32.30	32.24	26.29	175.63	0.6
		4/12/2021	198.62	201.92	22.30	32.30	32.30	32.27	25.70	176.22	0.3
		7/12/2021	198.62	201.92	22.30	32.30	32.30	32.27	25.12	176.80	0.3
		10/25/2021	198.62	201.92	22.30	32.30	32.30	32.27	26.36	175.56	0.3
		1/10/2022	198.62	201.92	22.30	32.30	32.30	32.28	26.83	175.09	0.2
16WW39	SHALLOW	3/16/2020	189.17	192.17	18.00	28.00	29.50	29.27	19.10	173.07	None
		7/15/2020	189.17	192.17	18.00	28.00	29.50	29.41	18.77	173.40	None
		10/14/2020	189.17	192.17	18.00	28.00	29.50	29.40	19.45	172.72	None
		2/3/2021	189.17	192.17	18.00	28.00	29.50	29.28	18.62	173.55	None
		4/15/2021	189.17	192.17	18.00	28.00	29.50	29.27	18.30	173.87	None
		7/28/2021	189.17	192.17	18.00	28.00	29.50	29.40	18.33	173.84	None
		10/25/2021	189.17	192.17	18.00	28.00	29.50	29.40	19.60	172.57	None
		1/11/2022	189.17	192.17	18.00	28.00	29.50	29.40	19.75	172.42	None
16WW40	SHALLOW	3/10/2020	179.39	182.19	10.80	20.80	21.30	17.50	9.80	172.39	33.0
		7/21/2020	179.39	182.19	10.80	20.80	21.30	19.20	10.15	172.04	16.0
		10/21/2020	179.39	182.19	10.80	20.80	21.30	19.95	10.61	171.58	8.5
		2/3/2021	179.39	182.19	10.80	20.80	21.30	19.95	9.72	172.47	8.5
		4/21/2021	179.39	182.19	10.80	20.80	21.30	17.63	9.53	172.66	31.7
		7/27/2021	179.39	182.19	10.80	20.80	21.30	18.55	9.88	172.31	22.5
		10/21/2021	179.39	182.19	10.80	20.80	21.30	18.89	11.08	171.11	19.1
		1/26/2022	179.39	182.19	10.80	20.80	21.30	18.52	11.00	171.19	22.8
16WW41	INTERMEDIATE	3/16/2020	195.38	197.98	42.60	52.60	53.60	53.02	24.95	173.03	None
		7/15/2020	195.38	197.98	42.60	52.60	53.60	53.03	24.33	173.65	None
		10/14/2020	195.38	197.98	42.60	52.60	53.60	53.03	25.85	172.13	None
		1/25/2021	195.38	197.98	42.60	52.60	53.60	53.02	24.10	173.88	None
		4/15/2021	195.38	197.98	42.60	52.60	53.60	53.00	23.88	174.10	None
		7/20/2021	195.38	197.98	42.60	52.60	53.60	53.03	23.75	174.23	None
		10/19/2021	195.38	197.98	42.60	52.60	53.60	53.03	24.82	173.16	None
		1/13/2022	195.38	197.98	42.60	52.60	53.60	53.06	25.35	172.63	None
16WW42	SHALLOW	3/10/2020	174.17	178.74	6.57	16.57	16.57	15.45	4.02	174.72	11.2
		7/23/2020	174.17	178.74	6.57	16.57	16.57	17.46	7.15	171.59	None
		10/22/2020	174.17	178.74	6.57	16.57	16.57	15.89	8.48	170.26	6.8
		1/28/2021	174.17	178.74	6.57	16.57	16.57	15.45	3.71	175.03	11.2
16WW42	SHALLOW	4/19/2021	174.17	178.74	6.57	16.57	16.57	15.45	3.59	175.15	11.2
		7/26/2021	174.17	178.74	6.57	16.57	16.57	16.47	6.48	172.26	1.0
		10/26/2021	174.17	178.74	6.57	16.57	16.57	15.47	11.20	167.54	11.0
		1/27/2022	174.17	178.74	6.57	16.57	16.57	15.55	9.85	168.89	10.2

Table 2-1
Groundwater Elevation Data, LHAAP-16

Monitoring Well	Zone	Date	Ground Surface Elevation (ft MSL)	Top of Casing Elevation (ft MSL)	Top of Screen (ft BTOC)	Bottom of Screen (ft BTOC)	Constructed Well Depth (ft BGS)	Measured Well Depth (ft TOC)	Depth to Water (ft TOC)	Groundwater Elevation (ft MSL)	Screened Interval Siltation (%)
16WW43	SHALLOW	3/12/2020	174.54	177.13	4.59	14.59	14.59	15.48	4.50	172.63	None
		7/23/2020	174.54	177.13	4.59	14.59	14.59	15.38	6.40	170.73	None
		10/22/2020	174.54	177.13	4.59	14.59	14.59	15.47	7.71	169.42	None
		1/28/2021	174.54	177.13	4.59	14.59	14.59	15.45	4.60	172.53	None
		4/22/2021	174.54	177.13	4.59	14.59	14.59	15.48	4.77	172.36	None
		7/28/2021	174.54	177.13	4.59	14.59	14.59	15.47	5.80	171.33	None
		10/18/2021	174.54	177.13	4.59	14.59	14.59	15.45	9.62	167.51	None
		1/25/2022	174.54	177.13	4.59	14.59	14.59	15.47	8.77	168.36	None
16WW44	SHALLOW	3/17/2020	196.47	198.65	22.18	32.18	32.18	32.95	23.07	175.58	None
		7/20/2020	196.47	198.65	22.18	32.18	32.18	32.90	22.65	176.00	None
		10/19/2020	196.47	198.65	22.18	32.18	32.18	32.95	23.35	175.30	None
		1/22/2021	196.47	198.65	22.18	32.18	32.18	32.92	22.32	176.33	None
		4/12/2021	196.47	198.65	22.18	32.18	32.18	32.93	22.13	176.52	None
		7/12/2021	196.47	198.65	22.18	32.18	32.18	32.95	21.91	176.74	None
		10/25/2021	196.47	198.65	22.18	32.18	32.18	33.02	23.27	175.38	None
		1/10/2022	196.47	198.65	22.18	32.18	32.18	32.92	23.57	175.08	None
16WW46	SHALLOW	3/12/2020	183.55	185.84	12.29	22.29	23.29	22.00	12.43	173.41	2.9
		7/27/2020	183.55	185.84	12.29	22.29	23.29	22.08	13.00	172.84	2.1
		10/19/2020	183.55	185.84	12.29	22.29	23.29	22.05	13.60	172.24	2.4
		1/19/2021	183.55	185.84	12.29	22.29	23.29	22.00	12.57	173.27	2.9
		4/12/2021	183.55	185.84	12.29	22.29	23.29	22.03	12.25	173.59	2.6
		7/27/2021	183.55	185.84	12.29	22.29	23.29	22.18	12.21	173.63	1.1
		10/18/2021	183.55	185.84	12.29	22.29	23.29	22.00	13.62	172.22	2.9
		1/11/2022	183.55	185.84	12.29	22.29	23.29	22.02	13.92	171.92	2.7
16WW48	SHALLOW	3/30/2020	181.46	184.41	12.95	22.95	22.95	22.56	11.04	173.37	3.9
		7/15/2020	181.46	184.41	12.95	22.95	22.95	22.80	11.62	172.79	1.5
		10/20/2020	181.46	184.41	12.95	22.95	22.95	22.55	12.24	172.17	4.0
		1/21/2021	181.46	184.41	12.95	22.95	22.95	22.56	10.87	173.54	3.9
		4/22/2021	181.46	184.41	12.95	22.95	22.95	22.58	10.32	174.09	3.7
		7/13/2021	181.46	184.41	12.95	22.95	22.95	22.62	11.03	173.38	3.3
		10/19/2021	181.46	184.41	12.95	22.95	22.95	22.55	12.72	171.69	4.0
		1/13/2022	181.46	184.41	12.95	22.95	22.95	22.58	12.53	171.88	3.7

Table 2-1
Groundwater Elevation Data, LHAAP-16

Monitoring Well	Zone	Date	Ground Surface Elevation (ft MSL)	Top of Casing Elevation (ft MSL)	Top of Screen (ft BTOC)	Bottom of Screen (ft BTOC)	Constructed Well Depth (ft BGS)	Measured Well Depth (ft TOC)	Depth to Water (ft TOC)	Groundwater Elevation (ft MSL)	Screened Interval Siltation (%)
16WW49	INTERMEDIATE	3/16/2020	187.66	190.69	45.03	55.03	55.03	54.73	17.52	173.17	3.0
		7/27/2020	187.66	190.69	45.03	55.03	55.03	54.73	17.52	173.17	3.0
		10/20/2020	187.66	190.69	45.03	55.03	55.03	54.80	18.25	172.44	2.3
		1/29/2021	187.66	190.69	45.03	55.03	55.03	54.70	17.03	173.66	3.3
		5/21/2021	187.66	190.69	45.03	55.03	55.03	54.77	16.75	173.94	2.6
		7/28/2021	187.66	190.69	45.03	55.03	55.03	54.71	17.02	173.67	3.2
		10/19/2021	187.66	190.69	45.03	55.03	55.03	54.70	18.63	172.06	3.3
		1/13/2022	187.66	190.69	45.03	55.03	55.03	54.73	18.71	171.98	3.0
16WW51	INTERMEDIATE	3/17/2020	180.13	183.26	34.13	44.13	44.63	44.57	10.45	172.81	None
		7/27/2020	180.13	183.26	34.13	44.13	44.63	44.60	11.15	172.11	None
		10/20/2020	180.13	183.26	34.13	44.13	44.63	44.53	12.10	171.16	None
		1/29/2021	180.13	183.26	34.13	44.13	44.63	44.53	9.97	173.29	None
		4/15/2021	180.13	183.26	34.13	44.13	44.63	44.55	10.00	173.26	None
		7/20/2021	180.13	183.26	34.13	44.13	44.63	44.53	11.19	172.07	None
		10/19/2021	180.13	183.26	34.13	44.13	44.63	44.55	12.85	170.41	None
		1/13/2022	180.13	183.26	34.13	44.13	44.63	44.55	12.60	170.66	None
16WW55	SHALLOW	3/25/2020	191.11	194.03	19.92	29.92	30.42	30.52	20.11	173.92	None
		7/14/2020	191.11	194.03	19.92	29.92	30.42	30.41	19.64	174.39	None
		10/13/2020	191.11	194.03	19.92	29.92	30.42	30.43	20.27	173.76	None
		1/20/2021	191.11	194.03	19.92	29.92	30.42	30.41	19.93	174.10	None
		4/20/2021	191.11	194.03	19.92	29.92	30.42	29.53	19.17	174.86	3.9
		7/13/2021	191.11	194.03	19.92	29.92	30.42	30.28	18.75	175.28	None
		10/14/2021	191.11	194.03	19.92	29.92	30.42	30.43	20.09	173.94	None
		1/12/2022	191.11	194.03	19.92	29.92	30.42	30.42	20.46	173.57	None
16WW56	SHALLOW	3/16/2020	195.35	198.61	24.26	34.26	34.56	37.07	25.66	172.95	None
		7/15/2020	195.35	198.61	24.26	34.26	34.56	34.08	25.40	173.21	1.8
		10/21/2020	195.35	198.61	24.26	34.26	34.56	34.05	26.20	172.41	2.1
		1/25/2021	195.35	198.61	24.26	34.26	34.56	34.05	25.09	173.52	2.1
		4/15/2021	195.35	198.61	24.26	34.26	34.56	34.08	25.00	173.61	1.8
		7/20/2021	195.35	198.61	24.26	34.26	34.56	34.08	24.60	174.01	1.8
		10/19/2021	195.35	198.61	24.26	34.26	34.56	34.08	26.25	172.36	1.8
		1/11/2022	195.35	198.61	24.26	34.26	34.56	34.05	26.43	172.18	2.1
16WW57	INTERMEDIATE	8/17/2020	173.12	177.06	29.94	39.94	41.94	39.95	4.95	172.11	None
		10/8/2020	173.12	177.06	29.94	39.94	41.94	39.94	5.35	171.71	0.0
		1/27/2021	173.12	177.06	29.94	39.94	41.94	39.94	3.78	173.28	0.0
		4/13/2021	173.12	177.06	29.94	39.94	41.94	39.93	4.18	172.88	0.1
		7/14/2021	173.12	177.06	29.94	39.94	41.94	39.91	4.27	172.79	0.3
16WW57	INTERMEDIATE	10/13/2021	173.12	177.06	29.94	39.94	41.94	39.92	5.75	171.31	0.2

Table 2-1
Groundwater Elevation Data, LHAAP-16

Monitoring Well	Zone	Date	Ground Surface Elevation (ft MSL)	Top of Casing Elevation (ft MSL)	Top of Screen (ft BTOC)	Bottom of Screen (ft BTOC)	Constructed Well Depth (ft BGS)	Measured Well Depth (ft TOC)	Depth to Water (ft TOC)	Groundwater Elevation (ft MSL)	Screened Interval Siltation (%)
		1/13/2022	173.12	177.06	29.94	39.94	41.94	39.92	5.68	171.38	0.2
16WW58	INTERMEDIATE	8/17/2020	173.32	177.24	31.92	41.92	43.92	42.80	6.97	170.27	None
		10/8/2020	173.32	177.24	31.92	41.92	43.92	42.82	6.78	170.46	None
		1/27/2021	173.32	177.24	31.92	41.92	43.92	42.81	4.41	172.83	None
		4/13/2021	173.32	177.24	31.92	41.92	43.92	42.82	5.65	171.59	None
		7/14/2021	173.32	177.24	31.92	41.92	43.92	42.80	6.14	171.10	None
		10/13/2021	173.32	177.24	31.92	41.92	43.92	42.82	6.10	171.14	None
		1/13/2022	173.32	177.24	31.92	41.92	43.92	42.80	7.83	169.41	None

Notes:

BGS - below ground surface

BTOC - below top of casing

ft - feet

MSL - mean sea level

Table 2-2
Year 2 RA-O Monitoring Network, LHAAP-16

Site Well ID	Well Description	Parameters
16IW09	Performance data within Landfill Biobarrier #1; Shallow Zone	VOCs, P, Alkalinity, Dissolved Gases, Bromide, TOC
16RW01	Upgradient well for Landfill Biobarrier #1; Shallow Zone	VOCs, P
16RW02	Upgradient well for Landfill Biobarrier #1; Shallow Zone	VOCs, P
16RW04	Downgradient well for Landfill Biobarrier #1; Shallow Zone	VOCs, P
16RW05	Downgradient well for Landfill Biobarrier #1; Shallow Zone	VOCs, P
16WW26	Downgradient well for Landfill Biobarrier #1; Shallow Zone	VOCs, P, Dissolved Gases, Bromide, TOC, DHC, Anions, Alkalinity
16WW42	Downgradient well for Landfill Biobarrier #1; Shallow Zone	VOCs, P , Dissolved Gases, TOC
16IW03	Performance data within Landfill Biobarrier #2; Shallow Zone	VOCs, P, Alkalinity, Anions, Diss Gases (MEE), Bromide, TOC
16PM02	Upgradient well for Landfill Biobarrier #2; Shallow Zone	VOCs, P
16PM03	Upgradient well for Landfill Biobarrier #2 Shallow Zone	VOCs, P
16PM06	Downgradient well for Landfill Biobarrier #2; Shallow Zone	VOCs, P
16PM09	Downgradient well for Landfill Biobarrier #2; Shallow Zone	VOCs, P
16PM14	Downgradient well for Landfill Biobarrier #2; Shallow Zone	VOCs, P
16WW36	Downgradient well for Landfill Biobarrier #2; Shallow Zone	VOCs, P, Diss gases (MEE), Bromide, TOC, DHC, Anions, Alkalinity
16IW10	Performance data within Landfill Biobarrier #3; Shallow Zone	VOCs, P, Alkalinity, Diss Gases (MEE), Anions, Bromide, TOC
16RW06	Upgradient well for Landfill Biobarrier #3; Shallow Zone	VOCs, P
16RW07	Upgradient well for Landfill Biobarrier #3; Shallow Zone	VOCs, P
16RW09	Downgradient well for Landfill Biobarrier #3; Shallow Zone	VOCs, P, Dissolved Gases,-TOC
16RW10	Downgradient well for Landfill Biobarrier #3; Shallow Zone	VOCs, P, Dissolved Gases,-TOC
16RW11	Performance data within the Bayou Biobarrier; Shallow Zone	VOCs, P
16IW20	Performance data within the Bayou Biobarrier; Shallow Zone	VOCs, P, Alkalinity, Anions, Diss Gases (MEE), TOC
16WW39	Upgradient well for Bayou Biobarrier; Shallow Zone	VOCs, P
16WW12	Upgradient well for Bayou Biobarrier; Shallow Zone	VOCs, P
16WW22	Upgradient well for Bayou Biobarrier; Shallow Zone	VOCs, P, Alkalinity, Anions, Diss Gases (MEE), Bromide, TOC, DHC
16WW40	Downgradient well for Bayou Biobarrier; Shallow Zone	VOCs, P , Diss Gases (MEE), TOC
16EW01	Performance data for injection ISB area - Shallow Zone Mid-Plume	VOCs, P, Alkalinity, Anions, Diss Gases (MEE), Bromide, TOC
16EW02	Performance data for injection ISB area - Shallow Zone Mid-Plume	VOCs, P

Table 2-2
Year 2 RA-O Monitoring Network, LHAAP-16

Site Well ID	Well Description	Parameters
16EW03	Performance data for injection ISB area - Shallow Zone Mid-Plume	VOCs, P, Alkalinity, Anions, Diss Gases (MEE), Bromide, TOC
16EW04	Performance data for injection ISB area - Shallow Zone Mid-Plume	VOCs, P
16EW05	Performance Data for Injection Well – Intermediate Zone Mid-Plume	VOCs, P, Alkalinity, Anions, Diss Gases (MEE), Bromide, TOC
16EW06	Performance Data for Injection Well – Intermediate Zone Mid-Plume	VOCs, P, Alkalinity, Anions, Diss Gases (MEE), Bromide, TOC
16EW07	Performance Data for Injection Well – Intermediate Zone Mid-Plume	VOCs, P
16EW08	Performance Data for Injection Well – Intermediate Zone Mid-Plume	VOCs, P
16WW48	Performance data for downgradient - Shallow Zone Mid-Plume	VOCs, P, Alkalinity, Anions, Diss Gases (MEE), Bromide, TOC, DHC
16WW30	Performance data for downgradient - Shallow Zone Mid-Plume	VOCs, P
16WW21	Upper Deep Zone between the Mid-Plume and Bayou Biobarrier	VOCs, P
16WW29	Performance Data for Injection Well – Intermediate Zone Mid-Plume	VOCs, P, Alkalinity, Anions, Diss Gases (MEE), Bromide, TOC, DHC
16WW49	Performance Data for Injection Well – Intermediate Zone Mid-Plume	VOCs, P
16WW51	Performance Data for Injection Well – Intermediate Zone Mid-Plume	VOCs, P
Surface Water Sampling		
16SW01	Surface water	VOCs, P, Metals
16SW02	Surface water	VOCs, P, Metals
16SW03	Surface water	VOCs, P, Metals
Additional Wells - MNA Network		
16WW13	Intermediate - MNA evaluation; downgradient of Landfill Biobarrier #1	VOCs, P
16WW14	Shallow - MNA evaluation; upgradient of Landfill Biobarrier #3	VOCs, P
16WW16	Shallow - MNA evaluation; upgradient of Landfill Biobarrier #2	VOCs, P, Alkalinity, Anions, Diss Gases (MEE), Bromide, TOC, DHC
16WW24	Shallow - MNA evaluation	VOCs, P
16WW32	Shallow - MNA evaluation	VOCs, P
16WW34	Shallow - MNA evaluation	VOCs, P
16WW35	Intermediate - MNA evaluation; downgradient of Landfill Biobarrier #2	VOCs, P, Alkalinity, Anions, Diss Gases (MEE), Bromide, TOC, DHC
16WW38	Shallow - MNA evaluation	VOCs, P
16WW41	Intermediate - MNA evaluation; upgradient of Bayou Biobarrier	VOCs, P, Alkalinity, Anions, Diss Gases (MEE), Bromide, TOC, DHC
16WW43	Shallow - MNA evaluation	VOCs, P
16WW44	Shallow - MNA evaluation	VOCs, P
16WW46	Shallow - MNA evaluation	VOCs, P
16WW55	Shallow - MNA evaluation; downgradient to Landfill Biobarrier #3	VOCs, P, Alkalinity, Anions, Diss Gases (MEE), Bromide, TOC, DHC
16WW56	Shallow - MNA evaluation; downgradient to Bayou Biobarrier	VOCs, P, Alkalinity, Anions, Diss Gases (MEE), Bromide, TOC, DHC
16WW23	Intermediate - MNA evaluation	VOCs, P

Table 2-2
Year 2 RA-O Monitoring Network, LHAAP-16

Site Well ID	Well Description	Parameters
16WW25	Intermediate - MNA evaluation; downgradient of Landfill Biobarrier #1	VOCs, P, Alkalinity, Anions, Diss Gases (MEE), Bromide, TOC, DHC
16WW27	Intermediate - MNA evaluation	VOCs, P
16WW31	Intermediate - MNA evaluation	VOCs, P
16WW33	Intermediate - MNA evaluation	VOCs, P
16WW37	Intermediate - MNA evaluation	VOCs, P
16WW57	Intermediate - MNA evaluation	VOCs, P, Alkalinity, Anions, Diss Gases (MEE), Bromide, TOC, DHC
16WW58	Intermediate- MNA evaluation	VOCs, P, Alkalinity, Anions, Diss Gases (MEE), Bromide, TOC, DHC

Notes:

MNA parameters for LHAAP-16 include: alkalinity, anions (nitrate and sulfate), ethene, ethane, and methane.

DHC - *Dehalococcoides ethenogenes*

Diss - dissolved

ID - identifier

ISB - in situ bioremediation

Metals - arsenic, chromium, manganese, nickel, and thallium

MEE - Methane, Ethane, and Ethene

MNA - monitored natural attenuation

P - perchlorate

RA-O - Remedial Action Operation

TOC - total organic carbon

VOCs - volatile organic compounds

Table 2-3
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #1, LHAAP-16

		Location Code		16IW09															
		Sample ID		16IW09-200325		16IW09-200325-FD		16IW09-200716		16IW09-201013		16IW09-210126		16IW09-210422		16IW09-210714		16IW09-211020	
		Sample Date		3/25/2020		3/25/2020		7/16/2020		10/13/2020		1/26/2021		4/22/2021		7/14/2021		10/20/2021	
		Sample Purpose		REG		FD		REG		REG		REG		REG		REG		REG	
		Location Description		Shallow; Landfill Biobarrier #1 Area		Shallow; Landfill Biobarrier #1 Area		Shallow; Landfill Biobarrier #1 Area		Shallow; Landfill Biobarrier #1 Area		Shallow; Landfill Biobarrier #1 Area		Shallow; Landfill Biobarrier #1 Area		Shallow; Landfill Biobarrier #1 Area		Shallow; Landfill Biobarrier #1 Area	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																			
	Dehalococcoides	cells/mL	NV	27.8		NA		5.1	J	< 7.2	U	2.9		NA		NA		NA	
FIELD TESTS																			
	Dissolved oxygen	mg/L	NV	0.09		0.09		1.52		0.09		2.5		0.03		0.4		0.2	
	Oxidation Reduction Potential	mV	NV	8		8		143		56		53.2		11		6		-3	
	pH	pH_units	NV	4.94		4.94		4.62		5.42		5.56		5.76		5.79		6.15	
	Specific conductivity	mS/cm	NV	1.15		1.15		1.49		1.75		1.705		1.33		1.14		1.13	
	Temperature	C	NV	17.47		17.47		24.37		19.26		18.17		15.58		21.33		19.21	
	Total Purge	Gal	NV	3.5		3.5		3		3.0		4.0		3		0.50		NA	
	Turbidity	NTU	NV	1,000		1000		1,000		382		15.4		58.3		48.8		23.3	
	Water Level at Reading Time	Ft BTOC	NV	5.13		5.13		7.34		10.49		4.12		5.59		7.6		NA	
GASES																			
	Ethane	µg/L	NV	11.4		11.9		17.9		< 0.25	U	< 0.47	U	< 0.5	U	< 0.25	U	< 0.5	U
	Ethylene	µg/L	NV	10.2		7.93		16.6		1.25		< 0.55	U	< 0.5	UJ	< 0.5	UJ	< 0.5	UJ
	Methane	µg/L	NV	1,340		1,110		3,970		< 0.25	U	5,200		3,500		1,460		2,540	J
GEN CHEMISTRY																			
	Alkalinity	mg/L	NV	432		440		428		698		610		598		649		774	
	Bromide	mg/L	NV	11.6		11.3		13.4		7.76		4.65		4.13		4.02		3.89	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	< 0.1	U	< 0.1	U	< 2	U	0.499		0.615		0.0908	J	< 0.1	U	< 0.1	U
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	1.43		1.48		4.44	J	11.2		7.11		4.75		1.44		1.34	
	Total organic carbon	mg/L	NV	820		820		1,840		1,250		787		572		381		140	
PERCHLORATE																			
	Perchlorate	µg/L	17	< 2	UJ	< 2	U	0.184	J	0.0381	J	< 0.25	U	< 0.05	U	< 1	U	< 0.2	U
VOLATILES																			
	1,1,2-Trichloroethane	µg/L	NV	< 5	UJ	< 5	U	< 50	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	< 5	UJ	< 5	U	< 25	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 5	UJ	< 5	UJ	< 25	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	< 5	UJ	< 5	UJ	< 25	U	4.1		2.8		3.1		4.6		3.5	
	Methylene chloride	µg/L	NV	< 10	UJ	< 10	UJ	< 50	U	< 1	U	< 2	U	< 2	U	< 1	U	< 1	U
	Trichloroethene	µg/L	5	< 5	UJ	< 5	U	< 25	U	5.8		1		0.62	J	3.8		0.99	J
	Vinyl chloride	µg/L	2	< 5	UJ	< 5	UJ	< 25	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-3
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #1, LHAAP-16

			Location Code	16IW09		16RW01													
			Sample ID	16IW09-220125		16RW01-200312		16RW01-200727		16RW01-201020		16RW01-210122		16RW01-210414		16RW01-210726		16RW01-211026	
			Sample Date	1/25/2022		3/12/2020		7/27/2020		10/20/2020		1/22/2021		4/14/2021		7/26/2021		10/26/2021	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Shallow; Landfill Biobarrier #1 Area		Shallow; Upgradient of Landfill Biobarrier #1		Shallow; Upgradient of Landfill Biobarrier #1		Shallow; Upgradient of Landfill Biobarrier #1		Shallow; Upgradient of Landfill Biobarrier #1		Shallow; Upgradient of Landfill Biobarrier #1		Shallow; Upgradient of Landfill Biobarrier #1		Shallow; Upgradient of Landfill Biobarrier #1	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																			
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																			
	Dissolved oxygen	mg/L	NV	0.58		0.08		0.05		0.52		0.73		0.21		1.11		0.63	
	Oxidation Reduction Potential	mV	NV	65		151		304		94		185.6		289		160		311	
	pH	pH_units	NV	6.29		5.49		5.15		5.08		5.31		4.84		5.49		4.97	
	Specific conductivity	mS/cm	NV	1.51		2.05		1.97		2.21		2.160		2.01		1.58		1.65	
	Temperature	C	NV	16.22		20.35		22.61		22.6		16.44		17.19		22.16		18.89	
	Total Purge	Gal	NV	NA		3		3		3		5.9		3.0		2.50		NA	
	Turbidity	NTU	NV	127		2.5		33.4		0		0		0.5		9.3		0	
	Water Level at Reading Time	Ft BTOC	NV	NA		16.27		16.43		17.09		16		15.57		15.27		NA	
GASES																			
	Ethane	µg/L	NV	< 0.5	U	NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	6.6	J	NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	936		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																			
	Alkalinity	mg/L	NV	782		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	5.23		NA		NA		NA		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	0.0407	J	NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	2.38		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	102		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																			
	Perchlorate	µg/L	17	0.16	J	< 2	U	1.63		< 0.05	U	< 0.05	UJ	0.0618	J	< 0.5	U	< 0.2	U
VOLATILES																			
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 2.5	U	< 5	U	< 10	U	< 10	U	< 10	U	< 5	U	< 5	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 2.5	U	3.1	J	< 5	U	< 5	U	< 5	U	< 2.5	U	< 2.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 2.5	U	< 2.5	U	< 5	U	< 5	U	< 5	U	< 2.5	U	< 2.5	U
	cis-1,2-Dichloroethene	µg/L	70	2.4		120		150		120		120		130		84		81	
	Methylene chloride	µg/L	NV	< 2	U	< 5	U	< 5	U	< 10	U	< 20	U	< 20	U	< 5	U	< 5	U
	Trichloroethene	µg/L	5	< 0.5	U	3,300		4,200		4,000		2,900		3,000		2,300		2,200	
	Vinyl chloride	µg/L	2	< 0.5	U	4	J	5.7		< 5	U	< 5	U	< 5	U	< 2.5	U	2.3	J

Table 2-3
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #1, LHAAP-16

		Location Code		16RW01		16RW02													
		Sample ID		16RW01-220124		16RW02-200312		16RW02-200721		16RW02-201022		16RW02-210122		16RW02-210414		16RW02-210726		16RW02-211013	
		Sample Date		1/24/2022		3/12/2020		7/21/2020		10/22/2020		1/22/2021		4/14/2021		7/26/2021		10/13/2021	
		Sample Purpose		REG		REG		REG		REG		REG		REG		REG		REG	
		Location Description		Shallow; Upgradient of Landfill Biobarrier #1		Shallow; Upgradient of Landfill Biobarrier #1		Shallow; Upgradient of Landfill Biobarrier #1		Shallow; Upgradient of Landfill Biobarrier #1		Shallow; Upgradient of Landfill Biobarrier #1		Shallow; Upgradient of Landfill Biobarrier #1		Shallow; Upgradient of Landfill Biobarrier #1		Shallow; Upgradient of Landfill Biobarrier #1	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																			
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																			
	Dissolved oxygen	mg/L	NV	0.54		0.69		0.02		0.26		0.83		0.2		0.7		0.24	
	Oxidation Reduction Potential	mV	NV	210		119		170		100		164.5		206		118		257	
	pH	pH_units	NV	4.84		5.26		5.24		5.17		6.04		5.3		5.55		4.84	
	Specific conductivity	mS/cm	NV	1.83		0.168		0.181		0.155		0.323		0.219		0.129		0.224	
	Temperature	C	NV	15.2		17.1		22.55		21.49		13.78		15.67		22.27		25.36	
	Total Purge	Gal	NV	NA		3.0		3		3.0		4.0		3.0		1.00		NA	
	Turbidity	NTU	NV	6.6		13.7		0		1.9		0		1.5		1.6		0	
	Water Level at Reading Time	Ft BTOC	NV	NA		6.55		9.4		12.06		4.87		6.38		9.12		NA	
GASES																			
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																			
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																			
	Perchlorate	µg/L	17	0.053	J	< 2	U	< 0.05	U	< 0.05	U	< 0.05	UJ	0.0612	J	0.0255	J	< 0.2	U
VOLATILES																			
	1,1,2-Trichloroethane	µg/L	NV	< 5	U	< 0.5	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	< 2.5	U	< 0.5	U	< 0.5	U	0.65	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 2.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	64		< 0.5	U	1		1.5		< 0.5	U	< 0.5	U	< 0.5	U	0.8	J
	Methylene chloride	µg/L	NV	< 10	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 1	U	< 1	U
	Trichloroethene	µg/L	5	1,200		2.3		4.8		6.7		1.9		3.1		2.1		2.7	
	Vinyl chloride	µg/L	2	< 2.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-3
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #1, LHAAP-16

			Location Code	16RW02				16RW04											
			Sample ID	16RW02-220124		16RW02-220124-FD		16RW04-200309		16RW04-200728		16RW04-201021		16RW04-201021-FD		16RW04-210128		16RW04-210414	
			Sample Date	1/24/2022		1/24/2022		3/9/2020		7/28/2020		10/21/2020		10/21/2020		1/28/2021		4/14/2021	
			Sample Purpose	REG		FD		REG		REG		REG		FD		REG		REG	
			Location Description	Shallow; Upgradient of Landfill Biobarrier #1		Shallow; Upgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																			
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																			
	Dissolved oxygen	mg/L	NV	0.76		0.76		0.2		0.04		0.03		0.03		0.52		0.09	
	Oxidation Reduction Potential	mV	NV	226		226		250		198		156		156		-3.6		283	
	pH	pH_units	NV	4.98		4.98		5.07		5.33		5.00		5.00		5.62		4.71	
	Specific conductivity	mS/cm	NV	0.205		0.205		2.06		1.79		1.96		1.96		2.104		1.71	
	Temperature	C	NV	16.17		16.17		17.61		20.90		21.08		21.08		16.48		16.99	
	Total Purge	Gal	NV	NA		NA		3		3		3		3		5		3	
	Turbidity	NTU	NV	3.3		3.3		13.1		1		0		0		0		8.3	
	Water Level at Reading Time	Ft BTOC	NV	NA		NA		17.7		17.66		18.56		18.56		17.3		16.54	
GASES																			
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																			
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		0.43		2.41		1.21		1.19		1.53		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		3.17		3.34		2.7		2.67		2.84		NA	
PERCHLORATE																			
	Perchlorate	µg/L	17	< 0.2	U	< 0.2	U	< 2	U	2.08		< 0.05	U	< 0.05	U	0.328	J	< 0.05	U
VOLATILES																			
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 2.5	U	< 10	U	< 2.5	U	< 5	U	< 10	U	< 5	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 2.5	U	< 5	U	4.1	J	3.2	J	< 5	U	< 2.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 2.5	U	< 5	U	< 2.5	U	< 2.5	U	< 5	U	< 2.5	U
	cis-1,2-Dichloroethene	µg/L	70	0.67	J	< 0.5	U	120		150		140		140		130		62	
	Methylene chloride	µg/L	NV	< 2	U	< 2	U	< 5	U	< 10	U	< 5	U	< 5	U	< 20	U	< 10	U
	Trichloroethene	µg/L	5	2.7		2.6		3,000		3,500		3,400		3,600		2,800		1,100	
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 2.5	U	4.1	J	5.3		5.6		< 5	U	< 2.5	U

Table 2-3
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #1, LHAAP-16

Location Code				16RW04						16RW05								
Sample ID				16RW04-210726		16RW04-211020		16RW04-220124		16RW05-200312		16RW05-200716		16RW05-201022		16RW05-210129		16RW05-210419	
Sample Date				7/26/2021		10/20/2021		1/24/2022		3/12/2020		7/16/2020		10/22/2020		1/29/2021		4/19/2021	
Sample Purpose				REG		REG		REG		REG		REG		REG		REG		REG	
Location Description				Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																			
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																			
	Dissolved oxygen	mg/L	NV	0.79		0.24		0.57		0.03		0.05		0.05		2.51		0.03	
	Oxidation Reduction Potential	mV	NV	205		220		222		-97		-207		-55		73.8		-3.44	
	pH	pH_units	NV	4.85		4.7		4.93		6.36		5.79		6.68		7.25		7.25	
	Specific conductivity	mS/cm	NV	1.65		1.65		1.85		3.01		3.33		3.50		4.258		4.01	
	Temperature	C	NV	20.39		22.33		15.91		18.15		23.01		22.14		14.36		16.53	
	Total Purge	Gal	NV	2		NA		NA		3		3		3.0		6		3	
	Turbidity	NTU	NV	15.5		3.1		8.2		684		68.1		126		17.8		79.4	
	Water Level at Reading Time	Ft BTOC	NV	16.67		NA		NA		5.03		6.43		10.29		4.7		4.53	
GASES																			
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																			
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		NA		52.8		55.2		44		45.8		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		500		416		117		34.8		NA	
PERCHLORATE																			
	Perchlorate	µg/L	17	< 0.5	U	< 0.2	U	< 0.2	U	< 2	U	1.77		< 0.05	U	< 0.5	U	< 0.1	U
VOLATILES																			
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 10	U	< 1	U	< 0.5	U	< 10	U	< 0.5	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	1.1		< 5	U	0.64	J	< 0.5	U	< 5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 5	U	< 0.5	U	< 0.5	U	< 5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	80		88		66		7.8		8	J	9.3		1.5		< 0.5	U
	Methylene chloride	µg/L	NV	< 1	U	< 10	U	< 2	U	< 1	U	< 10	U	< 1	U	< 2	U	< 2	U
	Trichloroethene	µg/L	5	1,200		1,600		970		3		< 5	U	0.89	J	< 0.5	U	0.52	J
	Vinyl chloride	µg/L	2	2		< 5	U	1.2		< 0.5	U	< 5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-3
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #1, LHAAP-16

			Location Code	16RW05						16WW13									
			Sample ID	16RW05-210714		16RW05-211018		16RW05-220124		16WW13-181012		16WW13-190918		16WW13-200312		16WW13-200723		16WW13-200723-FD	
			Sample Date	7/14/2021		10/18/2021		1/24/2022		10/12/2018		9/18/2019		3/12/2020		7/23/2020		7/23/2020	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		FD	
			Location Description	Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																			
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																			
	Dissolved oxygen	mg/L	NV	0.28		0.11		0.69		1.02		0.16		2.47		0.07		0.07	
	Oxidation Reduction Potential	mV	NV	-122		-43		117		225.7		190		161		183		183	
	pH	pH_units	NV	6.95		6.73		7.01		4.68		5.52		5.58		5.58		5.58	
	Specific conductivity	mS/cm	NV	3.85		4.07		3.87		10.94		1.54		0.362		0.791		0.791	
	Temperature	C	NV	22.20		21.34		15.57		21.16		20.56		17.91		21.27		21.27	
	Total Purge	Gal	NV	1.50		NA		NA		5.625		3		3		3.0		3.0	
	Turbidity	NTU	NV	50.7		8.3		29.2		222.8		1.3		11.1		1.4		1.4	
	Water Level at Reading Time	Ft BTOC	NV	7.7		NA		NA		10.07		9.38		3.9		5.89		5.89	
GASES																			
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																			
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		NA		0.929		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																			
	Perchlorate	µg/L	17	< 2	U	< 0.2	U	< 0.2	U	< 2	U	< 2	U	< 2	U	0.134		< 0.1	U
VOLATILES																			
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 1	U	< 5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 5	U	0.7	J	< 0.5	U	< 0.5	U	0.61	J
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	0.69	J	< 0.5	U	0.86	J	1,700		210		18		180		200	
	Methylene chloride	µg/L	NV	< 1	U	< 1	U	< 2	U	< 10	U	< 1	U	< 1	U	< 1	U	< 1	U
	Trichloroethene	µg/L	5	1.1		< 0.5	U	0.81	J	4,400		630		7.5		190		190	
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	0.9	J	51		5.6		< 0.5	U	4		3.9	

Table 2-3
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #1, LHAAP-16

			Location Code	16WW13												16WW25			
			Sample ID	16WW13-201022		16WW13-210122		16WW13-210419		16WW13-210726		16WW13-211026		16WW13-220127		16WW25-181009		16WW25-190919-FD	
			Sample Date	10/22/2020		1/22/2021		4/19/2021		7/26/2021		10/26/2021		1/27/2022		10/9/2018		9/19/2019	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		FD	
			Location Description	Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																			
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		< 0.5	U	NA	
FIELD TESTS																			
	Dissolved oxygen	mg/L	NV	0.32		5.7		0.89		0.51		0.63		0.56		0.31		0.31	
	Oxidation Reduction Potential	mV	NV	137		156.7		139		140		218		239		-13.4		-13.4	
	pH	pH_units	NV	4.69		6.04		5.54		5.57		5.2		5.47		5.95		5.95	
	Specific conductivity	mS/cm	NV	2.73		0.840		0.783		2.91		4.72		4.24		8.457		8.457	
	Temperature	C	NV	20.89		14.45		15.94		22.7		20.03		15.71		21.8		21.8	
	Total Purge	Gal	NV	3.0		4.5		3.0		1.00		NA		NA		4		4	
	Turbidity	NTU	NV	10.9		26.1		0.2		7.5		1.3		252		30.7		30.7	
	Water Level at Reading Time	Ft BTOC	NV	7.24		3.78		3.21		5.28		NA		NA		19.67		19.67	
GASES																			
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		0.316	J	NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		0.954	J	NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		13.7		NA	
GEN CHEMISTRY																			
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		69		NA	
	Bromide	mg/L	NV	NA		NA		NA		NA		NA		NA		2.86		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		489		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		0.066	J	NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		< 0.1	U	NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		< 0.2	U	NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		5,710		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		23.8		NA	
PERCHLORATE																			
	Perchlorate	µg/L	17	< 0.05	U	< 0.05	UJ	0.292		< 0.5	U	< 0.2	U	< 1	U	< 2	U	< 2	U
VOLATILES																			
	1,1,2-Trichloroethane	µg/L	NV	< 0.5	U	< 1	U	< 1	U	< 5	U	< 5	U	< 10	U	< 0.5	U	< 0.5	U
	1,1-Dichloroethene	µg/L	7	1.3		< 0.5	U	< 0.5	U	< 2.5	U	< 2.5	U	< 5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 2.5	U	< 2.5	U	< 5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	620		190		140		560		680		690		< 0.5	U	< 0.5	U
	Methylene chloride	µg/L	NV	< 1	U	< 2	U	< 2	U	< 5	U	< 5	U	< 20	U	< 1	U	< 1	U
	Trichloroethene	µg/L	5	1,100		97		22		1,500		2,800		2,300		< 0.5	U	< 0.5	U
	Vinyl chloride	µg/L	2	8.8		1.1		0.87	J	9.6		10		10		< 0.5	U	< 0.5	U

Table 2-3
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #1, LHAAP-16

			Location Code	16WW25															
			Sample ID	16WW25-190919		16WW25-200316		16WW25-200721		16WW25-201014		16WW25-210121		16WW25-210121-FD		16WW25-210420-FD		16WW25-210420	
			Sample Date	9/19/2019		3/16/2020		7/21/2020		10/14/2020		1/21/2021		1/21/2021		4/20/2021		4/20/2021	
			Sample Purpose	REG		REG		REG		REG		REG		FD		FD		REG	
			Location Description	Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																			
	Dehalococcoides	cells/mL	NV	NA		6.2		1.9		3.5		7		NA		NA		< 0.5	U
FIELD TESTS																			
	Dissolved oxygen	mg/L	NV	0.2		0.05		0.02		0.02		0.69		0.69		0.06		0.06	
	Oxidation Reduction Potential	mV	NV	-18.2		-38		-16		-14		-37.4		-37.4		-34		-34	
	pH	pH_units	NV	5.68		6.20		5.97		6.10		6.27		6.27		6.28		6.28	
	Specific conductivity	mS/cm	NV	7.927		8.80		8.42		9.24		5.167		5.167		8.40		8.40	
	Temperature	C	NV	20.01		16.98		20.90		17.30		16.34		16.34		16.36		16.36	
	Total Purge	Gal	NV	NA		3		3.0		3		5.5		5.5		3.0		3.0	
	Turbidity	NTU	NV	188.7		90.7		0.7		0		90.2		90.2		88.7		88.7	
	Water Level at Reading Time	Ft BTOC	NV	18.78		15.44		16.96		16.62		14.75		14.75		14.59		14.59	
GASES																			
	Ethane	µg/L	NV	NA		0.371	J	0.284	J	< 0.25	U	< 0.47	U	< 0.47	U	< 0.5	U	< 0.5	U
	Ethylene	µg/L	NV	NA		2.26		0.845	J	< 0.5	U	< 0.55	U	< 0.55	U	< 0.5	UJ	< 0.5	UJ
	Methane	µg/L	NV	NA		22.1		15.6		15.3		9.9		9.6		15.3		16.7	
GEN CHEMISTRY																			
	Alkalinity	mg/L	NV	NA		32.4		52.8		52.7		28.7		32.3		77.5		86.5	
	Bromide	mg/L	NV	NA		3.71	J	2.69		2.11		2.67		2.67		2.75		3.13	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		5,000		5,550		5,270		2,160		2,050		5,560		5,500	
	Total organic carbon	mg/L	NV	NA		31.2		27.9		27.7	J-	13.1	J	12.5		37		39.1	
PERCHLORATE																			
	Perchlorate	µg/L	17	< 2	U	< 2	U	0.512	J	0.077	J	< 0.5	U	< 0.5	U	< 0.25	U	< 0.25	U
VOLATILES																			
	1,1,2-Trichloroethane	µg/L	NV	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Methylene chloride	µg/L	NV	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 2	U	< 2	U
	Trichloroethene	µg/L	5	< 0.5	U	0.85	J	0.58	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-3
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #1, LHAAP-16

		Location Code		16WW25												16WW26			
		Sample ID		16WW25-210713		16WW25-210713-FD		16WW25-211014		16WW25-211014-FD		16WW25-220112-FD		16WW25-220112		16WW26-181009		16WW26-190917	
		Sample Date		7/13/2021		7/13/2021		10/14/2021		10/14/2021		1/12/2022		1/12/2022		10/9/2018		9/17/2019	
		Sample Purpose		REG		FD		REG		FD		FD		REG		REG		REG	
		Location Description		Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1		Intermediate; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																			
	Dehalococcoides	cells/mL	NV	5.3		NA		3.7		NA		NA		3.2		0.3	J	NA	
FIELD TESTS																			
	Dissolved oxygen	mg/L	NV	0.67		0.67		0.33		0.33		0.62		0.62		0.66		0.44	
	Oxidation Reduction Potential	mV	NV	-13		-13		27		27		40		40		50.4		-1.6	
	pH	pH_units	NV	6.02		6.02		5.82		5.82		6.42		6.42		5.08		5.21	
	Specific conductivity	mS/cm	NV	6.8		6.8		7.86		7.86		7.87		7.87		2.277		3.020	
	Temperature	C	NV	18.96		18.96		19.83		19.83		16.51		16.51		21.06		22.05	
	Total Purge	Gal	NV	3		3		NA		NA		NA		NA		3.5		NA	
	Turbidity	NTU	NV	1.5		1.5		0.6		0.6		38.2		38.2		5.8		101.4	
	Water Level at Reading Time	Ft BTOC	NV	15.69		15.69		NA		NA		NA		NA		19.39		18.03	
GASES																			
	Ethane	µg/L	NV	< 0.25	U	< 0.25	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	0.591	J	NA	
	Ethylene	µg/L	NV	0.657	J	< 0.5	UJ	< 0.5	UJ	1.94	J	< 0.5	UJ	< 0.5	UJ	2.59		NA	
	Methane	µg/L	NV	14.5		14		12	J	7.66	J	16.9		16.6		10.5		NA	
GEN CHEMISTRY																			
	Alkalinity	mg/L	NV	60		54.3		76.7	J	110	J	65.1	J	44.7	J	12		NA	
	Bromide	mg/L	NV	2.63		2.5		< 0.5	U	< 0.5	U	< 5	U	< 5	U	< 0.1	U	NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		163		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		0.128		NA	
	Nitrate	mg/L	10	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	0.201	J	0.324	J	< 0.1	U	NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		< 0.1	U	NA	
	Sulfate	mg/L	NV	5,570		5,340		4,250		4,070		4,780		4,840		1,170		NA	
	Total organic carbon	mg/L	NV	37.8		37.3		28.3		26.1		32.6		33.8		5.03		NA	
PERCHLORATE																			
	Perchlorate	µg/L	17	< 1	U	< 1	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 2	U	< 2	U
VOLATILES																			
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2.5	U	< 0.5	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 2.5	U	1.4	
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 2.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	290		35	
	Methylene chloride	µg/L	NV	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 5	U	< 1	U
	Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	2,400		380	
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	5	J	< 0.5	U

Table 2-3
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #1, LHAAP-16

Location Code				16WW26														
Sample ID				16WW26-190917-FD		16WW26-200309		16WW26-200721		16WW26-201014		16WW26-210121		16WW26-210420		16WW26-210713		16WW26-211014	
Sample Date				9/18/2019		3/9/2020		7/21/2020		10/14/2020		1/21/2021		4/20/2021		7/13/2021		10/14/2021	
Sample Purpose				FD		REG		REG		REG		REG		REG		REG		REG	
Location Description				Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																			
	Dehalococcoides	cells/mL	NV	NA		16.7		5.4		21.9		7.6		2.9		5.4		26.4	
FIELD TESTS																			
	Dissolved oxygen	mg/L	NV	0.44		0.07		0.05		0.71		0.97		0.88		1.19		0.48	
	Oxidation Reduction Potential	mV	NV	-1.6		266		189		68		99.9		279		222		243	
	pH	pH_units	NV	5.21		4.72		5.02		5.48		5.25		4.86		5.65		4.49	
	Specific conductivity	mS/cm	NV	3.020				1.4		1.69		1.211		1.44		0.645		0.851	
	Temperature	C	NV	22.05				21.28		15.38		16.5		14.51		18.55		21.09	
	Total Purge	Gal	NV	NA				3.0		3		4.6		3.0		2.00		NA	
	Turbidity	NTU	NV	101.4				31.2		10		14.1		35.3		57.7		7.9	
	Water Level at Reading Time	Ft BTOC	NV	18.03				15.13		16.17		14.81		13.24		14.32		NA	
GASES																			
	Ethane	µg/L	NV	NA		1.86		0.239	J	< 0.25	U	< 0.47	U	< 0.5	U	< 0.25	U	< 0.5	U
	Ethylene	µg/L	NV	NA		0.295	J	1.38		< 0.5	U	< 0.55	U	< 0.5	UJ	0.852	J	2.18	J
	Methane	µg/L	NV	NA		5.1		5.1		4.5		2.5		1.18		1.54		5.49	
GEN CHEMISTRY																			
	Alkalinity	mg/L	NV	NA		14.9		21.5		38.4		15		< 5	U	15.2		24.3	
	Bromide	mg/L	NV	NA		0.258		0.774		0.638		1.11		1.52		0.282		< 0.1	U
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		1.23		< 0.1	U	< 0.1	U	0.22		< 0.5	U	< 0.1	U	< 0.1	U
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		665		375	J-	354		749		341		342	
	Total organic carbon	mg/L	NV	NA		2.27		3.05		2.11		1.65		3.54		3.18		4.31	
PERCHLORATE																			
	Perchlorate	µg/L	17	< 2	U	< 2	U	0.025	J	< 0.05	U	< 0.05	U	< 0.05	U	< 1	U	< 0.2	U
VOLATILES																			
	1,1,2-Trichloroethane	µg/L	NV	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	1.6		1.4		1.7		2.5		1.5		0.7	J	< 0.5	U	0.77	J
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	36		56		38		78		54		8.7		3.7		36	
	Methylene chloride	µg/L	NV	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 1	U	< 1	U
	Trichloroethene	µg/L	5	440		900		490		850		1,000		130		26		500	
	Vinyl chloride	µg/L	2	< 0.5	U	1.3		0.88	J	1.9		1.4		< 0.5	U	< 0.5	U	< 0.5	U

Table 2-3
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #1, LHAAP-16

			Location Code	16WW26				16WW42											
			Sample ID	16WW26-220112		16WW26-220112-FD		16WW42-181012		16WW42-190916		16WW42-200310		16WW42-200310-FD		16WW42-200723		16WW42-200723-FD	
			Sample Date	1/12/2022		1/12/2022		10/12/2018		9/16/2019		3/10/2020		3/10/2020		7/23/2020		7/23/2020	
			Sample Purpose	REG		FD		REG		REG		REG		FD		REG		FD	
			Location Description	Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #1		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																			
	Dehalococcoides	cells/mL	NV	35.7		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																			
	Dissolved oxygen	mg/L	NV	0.59		0.59		1.21		1.89		1.52		1.52		0.04		0.04	
	Oxidation Reduction Potential	mV	NV	155		155		113.6		-31.4		241		241		9		9	
	pH	pH_units	NV	5.04		5.04		5.27		6.1		5.15		5.15		5.70		5.70	
	Specific conductivity	mS/cm	NV	1.09		1.09		0.984		1.165		0.158		0.158		0.464		0.464	
	Temperature	C	NV	14.96		14.96		21.5		26.19		17.54		17.54		23.13		23.13	
	Total Purge	Gal	NV	NA		NA		5.325		NA		3.0		3.0		3.0		3.0	
	Turbidity	NTU	NV	66.2		66.2		209.3		21.7		2.5		2.5		0		0	
	Water Level at Reading Time	Ft BTOC	NV	NA		NA		12.24		12.3		4.02		4.02		7.38		7.38	
GASES																			
	Ethane	µg/L	NV	< 0.5	U	< 0.5	U	NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	0.997	J	< 0.5	UJ	NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	4.01		3.86		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																			
	Alkalinity	mg/L	NV	43		44.3		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	0.457		0.522		0.182		NA		1.36		1.35		2.45		2.43	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	0.0479	J	0.0376	J	NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	372		370		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	4.58	J	6.48	J	NA		NA		1.73		1.68		4.16		4.33	
PERCHLORATE																			
	Perchlorate	µg/L	17	< 0.2	U	< 0.2	U	< 2	U	< 2	U	< 2	U	< 2	U	< 0.05	U	< 0.05	U
VOLATILES																			
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	0.79	J	0.76	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	44		41		42		240		8.6		8.2		24	J+	20	
	Methylene chloride	µg/L	NV	< 2	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
	Trichloroethene	µg/L	5	440		380		6		29		3.3		3.3		1.3		1.2	
	Vinyl chloride	µg/L	2	0.65	J	0.69	J	< 0.5	U	1.1		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-3
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #1, LHAAP-16

Location Code				16WW42											
Sample ID				16WW42-201022		16WW42-210128		16WW42-210419		16WW42-210726		16WW42-211026		16WW42-220127	
Sample Date				10/22/2020		1/28/2021		4/19/2021		7/26/2021		10/26/2021		1/27/2022	
Sample Purpose				REG		REG		REG		REG		REG		REG	
Location Description				Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC															
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA	
FIELD TESTS															
	Dissolved oxygen	mg/L	NV	0.04		2.94		0.15		0.58		0.31		0.46	
	Oxidation Reduction Potential	mV	NV	21		215.1		143		85		82		223	
	pH	pH_units	NV	5.94		5.37		5.88		5.48		5.7		5.54	
	Specific conductivity	mS/cm	NV	2.08		1.014		0.969		2.09		4.91		4.6	
	Temperature	C	NV	21.55		14.59		16.22		26.45		20.84		14.63	
	Total Purge	Gal	NV	3.0		5.6		3		3.00		NA		NA	
	Turbidity	NTU	NV	1.7		3.3		1.4		21.2		12.1		274	
	Water Level at Reading Time	Ft BTOC	NV	8.7		4		3.76		6.55		NA		NA	
GASES															
	Ethane	µg/L	NV	NA		NA		< 0.5	U	< 0.25		< 0.5	U	< 0.5	U
	Ethylene	µg/L	NV	NA		NA		< 0.5	UJ	0.83	J	< 0.5	UJ	< 0.5	UJ
	Methane	µg/L	NV	NA		NA		3.45		5.17		12.1		8.45	
GEN CHEMISTRY															
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	2.74		2.03		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	4.31		2.12		2.55		5.52		6.91	J	6.93	
PERCHLORATE															
	Perchlorate	µg/L	17	< 0.05	U	< 0.05	U	< 0.05	U	< 0.05	U	< 0.2	U	< 1	U
VOLATILES															
	1,1,2-Trichloroethane	µg/L	NV	< 0.5	U	< 1	U	< 1	U	< 1	U	< 10	U	< 5	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 5	U	< 2.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 5	U	< 2.5	U
	cis-1,2-Dichloroethene	µg/L	70	180		98		66		67		980		1,200	
	Methylene chloride	µg/L	NV	< 1	U	< 2	U	< 2	U	< 1	U	< 10	U	< 10	U
	Trichloroethene	µg/L	5	3.2		0.59	J	0.97	J	1.1		180		190	
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 5	U	< 2.5	U

Table 2-3
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #1, LHAAP-16

Notes:

COC concentrations highlighted in blue exceed the PCL/MCL.

µg/L - micrograms per liter

µS/cm - microsiemens per centimeter

J - The analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.

U - Not detected. The analyte was analyzed for, but not detected above the associated reporting limit.

cells/mL - cells per milliliter

deg. C - degrees Celsius

FD - field duplicate

Ft BTOC - feet below top of casing

Gal - gallon

ID - identifier

L - liters

MCL - maximum contaminant level

mg/L - milligrams per liter

mL/Min - milliliters per minute

mV - millivolts

NA - not analyzed

NTU - nephelometric turbidity unit

NV - no value

PCL - protective concentration level

RA-O - remedial action operation

Reg - regular sample

STD UNIT - standard unit

UTL - upper tolerance limit

Val Qual - validation qualifier

Table 2-4
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #2, LHAAP-16

			Location Code	16EW11		16EW12B		16EW13		16EW14B		16EW15		16IW03							
			Sample ID	16EW11-181013		16EW12B-181013		16EW13-181013		16EW14B-181013		16EW15-181013		16IW03-200325		16IW03-200728		16IW03-201013		16IW03-210126	
			Sample Date	10/13/2018		10/13/2018		10/13/2018		10/13/2018		10/13/2018		3/25/2020		7/28/2020		10/13/2020		1/26/2021	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Shallow, Extraction Well, Within Landfill Biobarrier #2		Shallow, Extraction Well, Within Landfill Biobarrier #2		Shallow, Extraction Well, Within Landfill Biobarrier #2		Shallow, Extraction Well, Within Landfill Biobarrier #2		Shallow, Extraction Well, Within Landfill Biobarrier #2		Shallow, Injection Well, Within Landfill Biobarrier #2		Shallow, Injection Well, Within Landfill Biobarrier #2		Shallow, Injection Well, Within Landfill Biobarrier #2		Shallow, Injection Well, Within Landfill Biobarrier #2	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		866		817		634		976	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	0.28		0.25		1.05		1.14		1.09		0.1		0.04		0.04		1.38	
	Flow Rate	mL/Min	NV	100		100		200		125		100		100		100		100		100	
	Oxidation Reduction Potential	mV	NV	-79.2		-72.7		-43.2		4.8		-134		-53		-97		-103		49.9	
	pH	STD UNIT	NV	6.31		6.23		5.81		5.72		7.07		5.21		5.41		5.35		5.33	
	Specific conductivity	mS/cm	NV	5.791		6.245		12.19		14.00		17.29		1.29		2.92		2.97		4.708	
	Temperature	deg. C	NV	20.45		20.29		20.97		21.13		25.77		24.76		21.64		19.20		19.71	
	Total Purge	Gal	NV	4		3.5		4.5		3.875		5		3		3.0		3		3.5	
	Turbidity	NTU	NV	9		0		24.4		19.9		75.5		123		36.1		34.3		11.4	
	Water Level at Reading Time	Ft BTOC	NV	21.35		17.9		17.93		16.94		18.97		14.69		14.59		15.12		14.43	
GASES																					
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		1.38		7.46		4.98	J+	2.7	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		4.6		50		57.7	J+	500	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		12.4		946		685		610	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		502		NA		771		1,390	
	Bromide	mg/L	NV	4.68		3.82		2.91		1.4		1.86		0.582		0.973		1.27		5.17	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		0.325		0.851		0.665	J+	< 0.1	UJ
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		6.92	J-	18.7	J-	10.9	J-	11.6	J
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		650		47.8		1,190		< 1	U
PERCHLORATE																					
	Perchlorate	µg/L	17	NA		NA		NA		NA		NA		< 2	U	1.85		0.0876	J	< 0.5	U
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	NA		NA		NA		NA		NA		< 5	U	< 25	U	4.1	J	< 10	U
	1,1-Dichloroethene	µg/L	7	NA		NA		NA		NA		NA		37		51		38		49	
	1,2-Dichloroethane	µg/L	5	NA		NA		NA		NA		NA		< 5	U	< 12	U	5.4		5.9	J
	cis-1,2-Dichloroethene	µg/L	70	NA		NA		NA		NA		NA		14,000		14,000		11,000		12,000	
	Methylene chloride	µg/L	NV	NA		NA		NA		NA		NA		< 10	U	< 25	U	< 5	U	< 20	U
	Trichloroethene	µg/L	5	NA		NA		NA		NA		NA		8,000		13,000		10,000		8,800	
	Vinyl chloride	µg/L	2	NA		NA		NA		NA		NA		160		460		530		3,700	

Table 2-4
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #2, LHAAP-16

			Location Code	16IW03										16PM02							
			Sample ID	16IW03-210126-FD		16IW03-210420		16IW03-210722		16IW03-211021		16IW03-220127		16PM02-200317		16PM02-200720		16PM02-201026		16PM02-210122	
			Sample Date	1/26/2021		4/20/2021		7/22/2021		10/21/2021		1/27/2022		3/17/2020		7/20/2020		10/26/2020		1/22/2021	
			Sample Purpose	FD		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Shallow, Injection Well, Within Landfill Biobarrier #2		Shallow, Injection Well, Within Landfill Biobarrier #2		Shallow, Injection Well, Within Landfill Biobarrier #2		Shallow, Injection Well, Within Landfill Biobarrier #2		Shallow, Injection Well, Within Landfill Biobarrier #2		Shallow, Performance Well, Upgradient of Landfill Biobarrier #2		Shallow, Performance Well, Upgradient of Landfill Biobarrier #2		Shallow, Performance Well, Upgradient of Landfill Biobarrier #2		Shallow, Performance Well, Upgradient of Landfill Biobarrier #2	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	1.38		0.18		0.46		0.18		0.23		0.09		0.03		0.11		0.49	
	Flow Rate	mL/Min	NV	100		100		100		NA		NA		100		100		100		210	
	Oxidation Reduction Potential	mV	NV	49.9		-58		-59		19		35		102		136		74		133	
	pH	STD UNIT	NV	5.33		5.21		5.16		5.13		5.46		5.91		5.42		5.59		5.91	
	Specific conductivity	mS/cm	NV	4.708		1.65		1.56		1.33		1.52		1.21		1.00		1.66		1.479	
	Temperature	deg. C	NV	19.71		18.15		20.65		19.2		16.07		19.16		21.38		19.12		18.16	
	Total Purge	Gal	NV	3.5		3.5		3.00		NA		NA		3.0		3		3		6.25	
	Turbidity	NTU	NV	11.4		26.1		29.7		28.2		27.1		273		104		27		0	
	Water Level at Reading Time	Ft BTOC	NV	14.43		14.13		14.6		NA		NA		16.44		16.45		16.85		15.68	
GASES																					
	Ethane	µg/L	NV	2.8		< 0.5	U	< 0.25	UJ	< 0.5	U	< 0.5	UJ	NA		NA		NA		NA	
	Ethylene	µg/L	NV	530		819	J	1,640	J	714	J	876	J	NA		NA		NA		NA	
	Methane	µg/L	NV	630		1,330		2,930	J	1,740	J	3,210	J	NA		NA		NA		NA	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	1,240		1,700		1,580		1,510		1,320		NA		NA		NA		NA	
	Bromide	mg/L	NV	4.2		6.6		NA		3.1		12.6		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	0.152	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA				NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	18.1	J	44.3		1.3	J	< 2.5	U	< 1	U	NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	< 1	U	2,860		2,750		2,610		2,630		NA		NA		NA		NA	
PERCHLORATE																					
	Perchlorate	µg/L	17	< 0.5	U	0.754	J	< 0.5	U	< 0.2	U	< 1	U	< 2	U	0.0686	J	< 0.05	U	< 0.05	UJ
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 10	U	< 10	U	< 10	U	< 20	UJ	< 25	U	< 25	U	< 25	U	< 25	U	< 25	U
	1,1-Dichloroethene	µg/L	7	48		46		38		38	J	42	J	32	J	44		74		34	
	1,2-Dichloroethane	µg/L	5	5.7	J	6.2	J	6.7	J	< 10	UJ	< 12	U	< 25	U	25		60		13	J
	cis-1,2-Dichloroethene	µg/L	70	12,000		11,000		10,000		14,000	J	15,000		3,200		4,800		8,800		2,700	
	Methylene chloride	µg/L	NV	< 20	U	17	J	16	UB	< 20	UJ	< 50	U	< 50	U	< 25	U	< 50	U	< 50	U
	Trichloroethene	µg/L	5	8,700		8,900		8,100		9,000	J	5,600		21,000		31,000		65,000		23,000	
	Vinyl chloride	µg/L	2	3,600		3,700		2,600		2,500	J	3000	J	51		110		240		50	

Table 2-4
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #2, LHAAP-16

			Location Code	16PM02								16PM03									
			Sample ID	16PM02-210414		16PM02-210713		16PM02-211025		16PM02-220124		16PM03-200317		16PM03-200720		16PM03-201026		16PM03-210122		16PM03-210414	
			Sample Date	4/14/2021		7/13/2021		10/25/2021		1/24/2022		3/17/2020		7/20/2020		10/26/2020		1/22/2021		4/14/2021	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Shallow, Performance Well, Upgradient of Landfill Biobarrier #2		Shallow, Performance Well, Upgradient of Landfill Biobarrier #2		Shallow, Performance Well, Upgradient of Landfill Biobarrier #2		Shallow, Performance Well, Upgradient of Landfill Biobarrier #2		Shallow, Performance Well, Upgradient of Landfill Biobarrier #2		Shallow, Performance Well, Upgradient of Landfill Biobarrier #2		Shallow, Performance Well, Upgradient of Landfill Biobarrier #2		Shallow, Performance Well, Upgradient of Landfill Biobarrier #2		Shallow, Performance Well, Upgradient of Landfill Biobarrier #2	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	0.07		0.97		0.23		0.78		0.06		3.7		0.02		0.51		0.13	
	Flow Rate	mL/Min	NV	100		100		NA		NA		100		100		100		180		100	
	Oxidation Reduction Potential	mV	NV	150		77		97		245		74		117		48		107.6		80	
	pH	STD UNIT	NV	5.33		5.37		5.64		5.42		6.35		5.57		6.28		6.38		6.06	
	Specific conductivity	mS/cm	NV	1.14		0.885		1.02		1.34		4.89		4.23		5.12		5.579		4.58	
	Temperature	deg. C	NV	17.54		19.52		21.41		16.32		18.51		21.94		18.65		17.45		17.05	
	Total Purge	Gal	NV	3		2.50		NA		NA		3		3.0		3		6.4		3.0	
	Turbidity	NTU	NV	101		14.2		21.1		83.1		33.1		24.2		43		0		82.2	
	Water Level at Reading Time	Ft BTOC	NV	15.91		14.95		NA		NA		16.44		15.26		16.16		15.1		15.27	
GASES																					
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																					
	Perchlorate	µg/L	17	0.0372	J	< 2.5	U	< 0.2	U	< 0.2	U	400		245		360		330	J	193	
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 25	U	< 25	U	< 25	U	< 25	U	< 5	U	< 20	U	< 10	U	< 10	U	< 25	U
	1,1-Dichloroethene	µg/L	7	27		32		21	J	48		66		50		40		31		37	
	1,2-Dichloroethane	µg/L	5	14	J	15	J	16	J	23	J	21		25		23		18		23	J
	cis-1,2-Dichloroethene	µg/L	70	2,200		3,400		2,500		4,500		6,600		9,300		5,700		5,300		6,800	
	Methylene chloride	µg/L	NV	< 50	U	< 25	U	< 25	U	< 50	U	< 10	U	< 20	U	17	J	< 20	U	< 50	U
	Trichloroethene	µg/L	5	15,000		17,000		16,000		31,000		9,700		9,100		12,000		9,800		8,800	
	Vinyl chloride	µg/L	2	40		43		35		99		370		320		370		310		220	

Table 2-4
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #2, LHAAP-16

			Location Code	16PM03												16PM06					
			Sample ID	16PM03-210414-FD		16PM03-210713-FD		16PM03-210713		16PM03-211025		16PM03-211025-FD		16PM03-220124		16PM06-200720		16PM06-201026		16PM06-210202	
			Sample Date	4/14/2021		7/13/2021		7/13/2021		10/25/2021		10/25/2021		1/24/2022		7/20/2020		10/26/2020		2/2/2021	
			Sample Purpose	FD		FD		REG		REG		FD		REG		REG		REG		REG	
			Location Description	Shallow, Performance Well, Upgradient of Landfill Biobarrier #2		Shallow, Performance Well, Upgradient of Landfill Biobarrier #2		Shallow, Performance Well, Upgradient of Landfill Biobarrier #2		Shallow, Performance Well, Upgradient of Landfill Biobarrier #2		Shallow, Performance Well, Upgradient of Landfill Biobarrier #2		Shallow, Performance Well, Upgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	0.13		0.49		0.49		0.15		0.15		0.6		0.05		0.02		0.03	
	Flow Rate	mL/Min	NV	100		100		100		NA		NA		NA		100		100		100	
	Oxidation Reduction Potential	mV	NV	80		38		38		112		112		187		1		-1		-108	
	pH	STD UNIT	NV	6.06		5.87		5.87		5.97		5.97		6.03		5.87		5.93		5.37	
	Specific conductivity	mS/cm	NV	4.58		4.56		4.56		4.51		4.51		4.5		4.7		5.11		4.97	
	Temperature	deg. C	NV	17.05		20.12		20.12		21.27		21.27		16.15		21.83		18.94		14.78	
	Total Purge	Gal	NV	3.0		1.50		1.50		NA		NA		NA		3		3		3	
	Turbidity	NTU	NV	82.2		12.6		12.6		20.1		20.1		57.3		93.1		0		61.3	
	Water Level at Reading Time	Ft BTOC	NV	15.27		14.27		14.27		NA		NA		NA		15.26		15.75		15.2	
GASES																					
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		NA		NA		NA		NA		6.08		4.26		6.17	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		8.08		6.88		8.53	
PERCHLORATE																					
	Perchlorate	µg/L	17	189		117		118		220		264		278		< 0.5	U	< 0.05	U	< 0.5	UJ
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 25	U	< 10	U	< 10	U	< 10	U	< 10	U	< 10	U	< 25	U	< 25	U	< 25	U
	1,1-Dichloroethene	µg/L	7	37		36		37		21		21		31		150		140		65	J
	1,2-Dichloroethane	µg/L	5	23	J	20		20		21		21		25		50		55		40	J
	cis-1,2-Dichloroethene	µg/L	70	7,100		8,000		8,300		7,400		7,500		7,100		49,000		47,000		33,000	J
	Methylene chloride	µg/L	NV	< 50	U	< 10	U	< 10	U	< 10	U	< 10	U	10	J	< 25	U	< 50	U	< 50	U
	Trichloroethene	µg/L	5	9,000		8,400		8,400		6,300		6,300		6,800		58,000		85,000		49,000	J
	Vinyl chloride	µg/L	2	240		230		220		120		120		200		2,100		1,800		790	J

Table 2-4
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #2, LHAAP-16

			Location Code	16PM06								16PM09									
			Sample ID	16PM06-210413		16PM06-210713		16PM06-211026		16PM06-220124		16PM09-200720		16PM09-201026		16PM09-210122		16PM09-210413		16PM09-210722	
			Sample Date	4/13/2021		7/13/2021		10/26/2021		1/24/2022		7/20/2020		10/26/2020		1/22/2021		4/13/2021		7/22/2021	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	0.1		1.42		0.22		0.48		0.06		0.1		0.67		0.12		0.55	
	Flow Rate	mL/Min	NV	100		100		NA		NA		100		100		200		100		100	
	Oxidation Reduction Potential	mV	NV	-33		-10		43		120		77		95		152.7		138		94	
	pH	STD UNIT	NV	6.29		5.56		5.81		5.84		5.76		5.22		6.15		5.88		6.08	
	Specific conductivity	mS/cm	NV	5.24		4.6		4.45		4.53		0.825		1.54		1.195		0.759		0.478	
	Temperature	deg. C	NV	18.85		20.64		20.94		17.1		24.62		18.99		18.33		19.12		22.43	
	Total Purge	Gal	NV	3.0		2.50		NA		NA		3		3.0		8.0		3		2.50	
	Turbidity	NTU	NV	128		220		16.2		39		340		182		2.8		352		419	
	Water Level at Reading Time	Ft BTOC	NV	14.52		14.27		NA		NA		13.59		14.26		12.87		13.49		12.9	
GASES																					
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																					
	Perchlorate	µg/L	17	< 0.5	U	0.0474	J	< 0.2	U	< 0.2	U	< 0.05	U	0.0253	J	< 0.05	UJ	0.0355	J	< 0.05	U
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 100	U	< 50	U	< 50	U	< 25	U	< 5	U	< 5	U	1.8		0.82	J	0.79	J
	1,1-Dichloroethene	µg/L	7	120		100		36	J	36		30		50		33		13		11	
	1,2-Dichloroethane	µg/L	5	54	J	35	J	40	J	33		< 2.5	U	< 2.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	42,000		38,000		11,000		17,000		520		1,000		560		210		200	
	Methylene chloride	µg/L	NV	< 200	U	< 50	U	< 50	U	< 50	U	< 5	U	< 5	U	< 2	U	< 2	U	< 1	U
	Trichloroethene	µg/L	5	77,000		57,000		19,000		28,000		1,400		2,000		1,300		640		370	
	Vinyl chloride	µg/L	2	1,800		930		390		350		23		47		32		10		9.1	

Table 2-4
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #2, LHAAP-16

			Location Code	16PM09				16PM14													
			Sample ID	16PM09-211026		16PM09-220124		16PM14-200720		16PM14-201026		16PM14-201026-FD		16PM14-210202		16PM14-210413		16PM14-210722		16PM14-211026	
			Sample Date	10/26/2021		1/24/2022		7/20/2020		10/26/2020		10/26/2020		2/2/2021		4/13/2021		7/22/2021		10/26/2021	
			Sample Purpose	REG		REG		REG		REG		FD		REG		REG		REG		REG	
			Location Description	Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	0.14		0.52		0.2		0.26		0.26		0.08		0.18		0.65		0.26	
	Flow Rate	mL/Min	NV	NA		NA		100		100		100		100		100		100		NA	
	Oxidation Reduction Potential	mV	NV	185		137		132		133		133		25		169		118		151	
	pH	STD UNIT	NV	5.36		5.41		5.97		6.20		6.20		5.69		6.03		6.17		6	
	Specific conductivity	mS/cm	NV	1.21		1.75		6.29		6.64		6.64		6.3		6.63		6.08		6.5	
	Temperature	deg. C	NV	21.23		17.53		22.84		19.06		19.06		15.09		20.22		20.42		20.41	
	Total Purge	Gal	NV	NA		NA		3		3		3		3.0		3.0		1.50		NA	
	Turbidity	NTU	NV	113		300		34.4		0		0		15.4		22		37.8		6.1	
	Water Level at Reading Time	Ft BTOC	NV	NA		NA		16.64		17.3		17.3		16.78		16.42		15.31		NA	
GASES																					
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		5.04		2.01		2.93		7.54		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																					
	Perchlorate	µg/L	17	< 0.2	U	< 0.2	U	0.435	J	< 0.1	U	< 0.1	U	0.648	J	0.259	J	< 0.5	U	< 0.2	U
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 5	U	3.7	J	< 10	U	< 10	U	< 5	U	< 10	U	< 20	U	< 10	U	< 10	U
	1,1-Dichloroethene	µg/L	7	20		52		21		25		22		18		14	J	15		9.5	J
	1,2-Dichloroethane	µg/L	5	< 2.5	U	< 2.5	U	24		26		25		23	J	22		21		18	
	cis-1,2-Dichloroethene	µg/L	70	520		950		3,300		3,200		3,500		3,500		2,900		3,700		2,900	
	Methylene chloride	µg/L	NV	< 5	U	< 10	U	< 10	U	< 10	U	< 10	U	< 20	U	< 40	U	< 10	U	< 10	U
	Trichloroethene	µg/L	5	770		1300		5,100		5,400		5,800		3,800		4,300		3,700		2,200	
	Vinyl chloride	µg/L	2	23		84		150		140		140		130		110		110		56	

Table 2-4
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #2, LHAAP-16

			Location Code	16PM14		16WW16													
			Sample ID	16PM14-220124		16WW16-181010		16WW16-190916		16WW16-200311		16WW16-200714		16WW16-201008		16WW16-210120		16WW16-210415		16WW16-210720	
			Sample Date	1/24/2022		10/10/2018		9/16/2019		3/11/2020		7/14/2020		10/8/2020		1/20/2021		4/15/2021		7/20/2021	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow; Upgradient of Landfill Biobarrier #2		Shallow; Upgradient of Landfill Biobarrier #2		Shallow; Upgradient of Landfill Biobarrier #2		Shallow; Upgradient of Landfill Biobarrier #2		Shallow; Upgradient of Landfill Biobarrier #2		Shallow; Upgradient of Landfill Biobarrier #2		Shallow; Upgradient of Landfill Biobarrier #2		Shallow; Upgradient of Landfill Biobarrier #2	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	NA		< 0.5	U	NA		5.1		2.3		0.5		1.1		0.1	J	0.5	J
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	0.63		0.96		0.28		0.44		0.76		0.02		0.99		1.36		1.15	
	Flow Rate	mL/Min	NV	NA		150		250		100		100		100		120		100		100	
	Oxidation Reduction Potential	mV	NV	176		193.6		58.9		113		104		75		162.1		173		118	
	pH	STD UNIT	NV	6.06		6.1		6.12		6.59		6.48		6.36		6.59		6.08		6.15	
	Specific conductivity	mS/cm	NV	6.14		6.424		4.548		4.42		4.43		4.60		5.616		3.66		3.92	
	Temperature	deg. C	NV	16.77		20.82		21.66		24.53		21.32		20.6		16.92		17.39		19.25	
	Total Purge	Gal	NV	NA		6.375		NA		3.5		3.0		3.0		4		3		1.5	
	Turbidity	NTU	NV	29		136.2		110.2		40.6		4.6		4.3		0		3.2		8.1	
	Water Level at Reading Time	Ft BTOC	NV	NA		23.43		21.5		21.02		20.65		20.92		20.58		20.11		19.59	
GASES																					
	Ethane	µg/L	NV	NA		2.31		NA		4.87		5.33		5.64		0.75		2.4		2.23	
	Ethylene	µg/L	NV	NA		4.98		NA		10.2		10.4		11.6		2.8		3.44	J	4.11	J
	Methane	µg/L	NV	NA		403		NA		1,210		997		907		380		437	J	407	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	NA		362		NA		397		400		391		344		338		363	
	Bromide	mg/L	NV	NA		4.69		NA		4.51		5.82		6.75		5.92		3.97		4.32	
	Chloride	mg/L	NV	NA		1,100		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		0.172		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		< 0.1	U	NA		< 0.1	U	< 0.1	U	< 0.5	U	0.741		< 0.1	U	< 0.2	U
	Nitrite	mg/L	1	NA		< 0.1	U	NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		722		NA		433		521		491		849		367		428	
	Total organic carbon	mg/L	NV	NA		4.34		NA		4.85		18.4		3.35		4.07		4.71		4.46	
PERCHLORATE																					
	Perchlorate	µg/L	17	< 0.2	U	420		460		510		442		480		309		288		408	
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 10	U	< 25	U	< 12	U	< 12	U	< 25	U	< 25	U	< 5	U	< 50	U	< 25	U
	1,1-Dichloroethene	µg/L	7	13		< 25	U	25		37		50		59		12		33	J	29	
	1,2-Dichloroethane	µg/L	5	21		< 25	U	19	J	30		32		33		8.6		32	J	33	
	cis-1,2-Dichloroethene	µg/L	70	3,100		8,500		6,600		13,000		16,000		17,000		2,800		13,000		15,000	
	Methylene chloride	µg/L	NV	< 20	U	< 50	U	< 25	U	< 25	U	< 25	U	44	J	< 10	U	< 100	U	35	UB
	Trichloroethene	µg/L	5	2,300		21,000		13,000		27,000		28,000		32,000		5,700		28,000		30,000	
	Vinyl chloride	µg/L	2	81		330		220		300		430		470		110		260		170	

Table 2-4
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #2, LHAAP-16

			Location Code	16WW16				16WW35											
			Sample ID	16WW16-211013		16WW16-220111		16WW35-181010		16WW35-190918		16WW35-200311		16WW35-200714		16WW35-201013		16WW35-210120		16WW35-210413	
			Sample Date	10/13/2021		1/11/2022		10/10/2018		9/18/2019		3/11/2020		7/14/2020		10/13/2020		1/20/2021		4/13/2021	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Shallow; Upgradient of Landfill Biobarrier #2		Shallow; Upgradient of Landfill Biobarrier #2		Intermediate; Downgradient of Landfill Biobarrier #2		Intermediate; Downgradient of Landfill Biobarrier #2		Intermediate; Downgradient of Landfill Biobarrier #2		Intermediate; Downgradient of Landfill Biobarrier #2		Intermediate; Downgradient of Landfill Biobarrier #2		Intermediate; Downgradient of Landfill Biobarrier #2		Intermediate; Downgradient of Landfill Biobarrier #2	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	0.1	J	0.4	J	33.9		NA		516		36.6		76.2		61.4		30	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	0.41		0.73		0.42		0.26		0.07		0.18		0.16		0.89		0.07	
	Flow Rate	mL/Min	NV	NA		NA		125		100		100		100		100		180		100	
	Oxidation Reduction Potential	mV	NV	128		191		158.6		143		122		137		181		147.9		105	
	pH	STD UNIT	NV	5.83		6.14		6.17		6.64		6.85		6.62		6.63		6.89		6.88	
	Specific conductivity	mS/cm	NV	3.54		3.6		13.52		14.2		16.4		16.3		17.5		15.47		16.9	
	Temperature	deg. C	NV	20.72		14.77		21.27		20.59		20.7		21.53		17.40		15.79		18.19	
	Total Purge	Gal	NV	NA		NA		4.125		3		3		3		3		7.3		3.0	
	Turbidity	NTU	NV	3.8		75.1		5.1		14		3.5		0		0		0		50.3	
	Water Level at Reading Time	Ft BTOC	NV	NA		NA		20.29		17.72		17.05		16.79		17.22		16.81		16.24	
GASES																					
	Ethane	µg/L	NV	2.29		2.63		0.644	J	NA		1.2		0.824	J	1.01		0.2	J	< 0.5	U
	Ethylene	µg/L	NV	3.29	J	3.93	J	4.38		NA		10.9		9.31		9.34		2.6		8.75	J
	Methane	µg/L	NV	406		490	J	55		NA		140		114		96.9		53		102	J
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	365		365		969		NA		1,140		1,180		1,140		886		1,090	
	Bromide	mg/L	NV	< 0.1	U	2.54		< 0.2	U	NA		< 1	U	< 1	U	< 0.5	U	3.46		< 0.5	U
	Chloride	mg/L	NV	NA		NA		699		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		0.272		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	< 0.1	U	0.0442	J	< 0.2	U	NA		< 1	U	< 1	U	< 0.5	U	NA	U	< 0.5	U
	Nitrite	mg/L	1	NA		NA		< 0.2	U	NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	192		372		8,400		NA		8,660		9,850		9,510		7,880		9,810	
	Total organic carbon	mg/L	NV	6.66		4.69	J	44		NA		58.5		67		65.5		27.8		59.1	
PERCHLORATE																					
	Perchlorate	µg/L	17	555		561		420		410		560		451		565		< 0.5	U	367	
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 25	U	< 25	U	< 25	U	< 12	U	< 5	U	< 10	U	< 2.5	U	7.2	J	< 10	U
	1,1-Dichloroethene	µg/L	7	33		25		190		120		96		81		93		120		85	
	1,2-Dichloroethane	µg/L	5	41		35		< 25	U	< 12	U	< 5	U	< 5	U	< 2.5	U	8.2	J	< 5	U
	cis-1,2-Dichloroethene	µg/L	70	18,000		14,000		19,000		8,800		4,000		1,700		1,600		12,000		2,100	
	Methylene chloride	µg/L	NV	< 25	U	< 50	U	< 50	U	< 25	U	< 10	U	< 10	U	< 5	U	< 20	U	17	J
	Trichloroethene	µg/L	5	34,000		29,000		21,000		13,000		11,000		9,500		11,000		13,000		9,300	
	Vinyl chloride	µg/L	2	200		170		170		75		82		93		97		60		90	

Table 2-4
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #2, LHAAP-16

			Location Code	16WW35						16WW36											
			Sample ID	16WW35-210714		16WW35-211013		16WW35-220111		16WW36-181009		16WW36-190916		16WW36-200311		16WW36-200714		16WW36-201013		16WW36-210120	
			Sample Date	7/14/2021		10/13/2021		1/11/2022		10/9/2018		9/16/2019		3/11/2020		7/14/2020		10/13/2020		1/20/2021	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Intermediate; Downgradient of Landfill Biobarrier #2		Intermediate; Downgradient of Landfill Biobarrier #2		Intermediate; Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	21.1		52.2		59.2		202		NA		1,500		892		1,680		7.9	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	1.02		0.27		0.45		0.39		0.21		0.1		2.42		0.25		2.77	
	Flow Rate	mL/Min	NV	100		NA		NA		100		250		100		100		100		140	
	Oxidation Reduction Potential	mV	NV	29		158		125		116.1		87.4		101		105		223		141.1	
	pH	STD UNIT	NV	6.73		6.04		7.14		6.07		5.98		6.61		6.29		6.06		6.72	
	Specific conductivity	mS/cm	NV	16.20		22.2		17.7		11.03		8.561		7.24		7.50		7.59		2.023	
	Temperature	deg. C	NV	20.50		21.6		10.47		22.32		21.86		20.57		22.14		18.25		17.29	
	Total Purge	Gal	NV	2		NA		NA		3.5		NA		3		3.0		3		4.5	
	Turbidity	NTU	NV	17.4		16.5		5.2		1.8		1.1		0		0		0		0	
	Water Level at Reading Time	Ft BTOC	NV	15.8		NA		NA		19.41		17.43		16.63		16.89		16.49		16.12	
GASES																					
	Ethane	µg/L	NV	1.47		< 0.5	U	< 0.5	U	< 1	U	NA		2.16		3.38		1.09		< 0.47	U
	Ethylene	µg/L	NV	11.8	J	5.3	J	3.47	J	12.3		NA		18.9		26.1		10.1		0.81	J
	Methane	µg/L	NV	15.4		49.8		76.6	J	175		NA		749		944		273		240	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	1,080		1,020		1,000		613		NA		614		580		563		465	
	Bromide	mg/L	NV	< 0.5	U	< 0.5	U	< 0.5	U	2.7		NA		0.91		2.85		2.41		0.503	
	Chloride	mg/L	NV	NA		NA		NA		793		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		0.251		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	< 0.5	U	< 0.5	U	0.262	J	< 0.2	U	NA		< 0.5	U	< 0.5	U	< 0.5	U	0.074	J
	Nitrite	mg/L	1	NA		NA		NA		< 0.2	U	NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	4,850		8,550		8,090		6,290		NA		2,670		3,330		2,840		180	
	Total organic carbon	mg/L	NV	68.7		52.2		53.1		33		NA		19.7		18.6		18.3		10.2	
PERCHLORATE																					
	Perchlorate	µg/L	17	352		366		342		< 2	U	< 2	U	< 2	U	< 0.5	U	0.167		< 0.05	U
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 10	U	< 10	U	< 10	U	< 25	U	< 12	U	< 12	U	< 25	U	< 50	U	0.94	J
	1,1-Dichloroethene	µg/L	7	100		72		77		450		190		160		290		170		15	
	1,2-Dichloroethane	µg/L	5	< 5	U	< 5	U	< 5	U	34	J	13	J	13	J	20	J	< 25	U	0.85	J
	cis-1,2-Dichloroethene	µg/L	70	2,000		5,100		4,400		66,000		19,000		19,000		29,000		26,000		980	
	Methylene chloride	µg/L	NV	< 10	U	< 10	U	< 20	U	< 50	U	< 25	U	< 25	U	< 25	U	< 50	U	< 2	U
	Trichloroethene	µg/L	5	8,100		9,700		11,000		22,000		15,000		18,000		25,000		22,000		1,500	
	Vinyl chloride	µg/L	2	74		39		58		610		230		180		320		180		17	

Table 2-4
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #2, LHAAP-16

		Location Code	16WW36								
		Sample ID	16WW36-210413		16WW36-210714		16WW36-211013		16WW36-220111	
		Sample Date	4/13/2021		7/14/2021		10/13/2021		1/11/2022	
		Sample Purpose	REG		REG		REG		REG	
		Location Description	Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2		Shallow, Performance Well, Downgradient of Landfill Biobarrier #2	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC											
	Dehalococcoides	cells/mL	NV	620		1,200		1,020		1,200	
FIELD TESTS											
	Dissolved oxygen	mg/L	NV	0.7		0.85		0.19		0.54	
	Flow Rate	mL/Min	NV	100		100		NA		NA	
	Oxidation Reduction Potential	mV	NV	179		100		149		154	
	pH	STD UNIT	NV	6.20		6.09		5.65		6.58	
	Specific conductivity	mS/cm	NV	4.85		8.39		6.13		5.29	
	Temperature	deg. C	NV	18.02		19.89		20.87		14.82	
	Total Purge	Gal	NV	3		1.00		NA		NA	
	Turbidity	NTU	NV	3.7		3.8		0		0	
	Water Level at Reading Time	Ft BTOC	NV	15.68		15.17		NA		NA	
GASES											
	Ethane	µg/L	NV	< 0.5	U	1.51		< 0.5	U	< 0.5	U
	Ethylene	µg/L	NV	4.9	J	11.7	J	2.54	J	3.3	J
	Methane	µg/L	NV	151	J	325		65.7		101	J
GEN CHEMISTRY											
	Alkalinity	mg/L	NV	479		462		482		490	
	Bromide	mg/L	NV	1.96		0.931		< 0.5	U	< 0.5	U
	Chloride	mg/L	NV	NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA	
	Nitrate	mg/L	10	< 0.5	U	0.48	J	< 0.5	U	0.225	J
	Nitrite	mg/L	1	NA		NA		NA		NA	
	Sulfate	mg/L	NV	1,850		2,940		2,910		2,310	
	Total organic carbon	mg/L	NV	15.1		19.5		21.6		21.7	
PERCHLORATE											
	Perchlorate	µg/L	17	1.26		0.438	J	0.291	J	0.098	J
VOLATILES											
	1,1,2-Trichloroethane	µg/L	NV	< 25	U	5.7	J	< 10	U	< 10	U
	1,1-Dichloroethene	µg/L	7	74		180		39		39	
	1,2-Dichloroethane	µg/L	5	< 12	U	13	J	10		8	J
	cis-1,2-Dichloroethene	µg/L	70	9,000		17,000		8,700		6,700	
	Methylene chloride	µg/L	NV	43	J	< 10	U	< 10	U	< 20	U
	Trichloroethene	µg/L	5	10,000		15,000		8,100		8,100	
	Vinyl chloride	µg/L	2	78		140		43		49	

Table 2-4
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #2, LHAAP-16

Notes:

COC concentrations highlighted in blue exceed the PCL/MCL.

µg/L - micrograms per liter

µS/cm - microsiemens per centimeter

J - The analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.

U - Not detected. The analyte was analyzed for, but not detected above the associated reporting limit.

cells/mL - cells per milliliter

deg. C - degrees Celsius

FD - field duplicate

Ft BTOC - feet below top of casing

Gal - gallons

ID - identifier

L - liters

MCL - maximum contaminant level

mg/L - milligrams per liter

mL/Min - milliliters per minute

mV - millivolts

NA - not analyzed

NTU - nephelometric turbidity unit

NV - no value

PCL - protective concentration level

RA-O - remedial action operation

Reg - regular sample

STD UNIT - standard unit

UTL - upper tolerance limit

Val Qual - validation qualifier

Table 2-5
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #3, LHAAP-16

			Location Code	16IW10																	
			Sample ID	16IW10-200325		16IW10-200714		16IW10-201013		16IW10-210126		16IW10-210126-FD		16IW10-210421		16IW10-210722		16IW10-211020		16IW10-220125	
			Sample Date	3/25/2020		7/14/2020		10/13/2020		1/26/2021		1/26/2021		4/21/2021		7/22/2021		10/20/2021		1/25/2022	
			Sample Purpose	REG		REG		REG		REG		FD		REG		REG		REG		REG	
			Location Description	Shallow; Landfill Biobarrier #3 Area		Shallow; Landfill Biobarrier #3 Area		Shallow; Landfill Biobarrier #3 Area		Shallow; Landfill Biobarrier #3 Area		Shallow; Landfill Biobarrier #3 Area		Shallow; Landfill Biobarrier #3 Area		Shallow; Landfill Biobarrier #3 Area		Shallow; Landfill Biobarrier #3 Area		Shallow; Landfill Biobarrier #3 Area	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	9,120		6,110		59,500		370,000		NA		NA		NA		NA		NA	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	0.09		0.05		0.13		1.1		1.1		0.03		0.87		0.32		0.51	
	Oxidation Reduction Potential	mV	NV	-21		-17		-83		61.1		61.1		-40		-47		-65		-16	
	pH	STD UNIT	NV	5.19		5.72		6.37		6.11		6.11		6.08		6.13		6.55		6.52	
	Specific conductivity	µmhos/cm	NV	5.71		5.19		5.80		4.94		4.94		4.39		4.24		4.49		4.5	
	Temperature	C	NV	18.66		23.78		20.87		18.21		18.21		16.97		21.25		16.5		14.39	
	Total Purge	L	NV	3.0		3		3.0		2.5		2.5		3.0		1.5		NA		NA	
	Turbidity	NTU	NV	1,000		243		289		97.6		97.6		190		157		62.4		143	
	Water Level at Reading Time	Ft BTOC	NV	21.81		21.63		22.02		21.41		21.41		20.89		20.52		NA		NA	
GASES																					
	Ethane	µg/L	NV	6.46		7.51		< 0.25	U	< 0.47	U	< 0.47	U	< 0.5	UJ	< 0.25	UJ	< 0.5	U	< 0.5	UJ
	Ethylene	µg/L	NV	48.3		66.7		19.1		9.9		7.6		6.83	J	2.68	J	13.2	J	3.28	J
	Methane	µg/L	NV	1,450		4,650		1,470		1,200	J	780	J	733		257		2520	J	343	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	2,390		1,760		1,680		1,320		1,320		1,190		1,050		1,110		1,130	
	Bromide	mg/L	NV	143		119		94.8		83.6		84.5		88.1		79.1		59.6	J	56.5	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	< 0.1	U	< 0.1	U	< 0.5	U	< 0.2	U	< 0.2	U	1.26	J	< 0.5	U	< 0.2	U	< 0.2	U
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	3.19		4.43		5.73		6.59		6.79		< 1	U	< 2.5	U	< 1	U	< 1	U
	Total organic carbon	mg/L	NV	2,720		< 2	U	1,220		836		857		746		630		203	J	211	
PERCHLORATE																					
	Perchlorate	µg/L	17	< 2	U	< 0.5	U	< 0.1	U	< 0.5	U	< 0.5	U	< 0.1	U	< 0.1	U	< 0.2	U	0.13	J
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 5	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 10	U	< 1	U
	1,1-Dichloroethene	µg/L	7	< 5	U	1.5		0.67	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 5	U	0.96	J	0.98	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	110		110		220		23		22		15		19		11		2	
	Methylene chloride	µg/L	NV	< 10	U	< 1	U	< 1	U	< 2	U	< 2	U	< 2	U	< 1	U	< 10	U	< 2	U
	Trichloroethene	µg/L	5	200		190		46		31		29		5.4		13		< 5	U	0.91	J
	Vinyl chloride	µg/L	2	< 5	U	8.4		53		8.3		8.3		2.5		1.3		< 5	U	< 0.5	U

Table 2-5
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #3, LHAAP-16

			Location Code	16RW06															
			Sample ID	16RW06-200317		16RW06-200714		16RW06-201026		16RW06-210122		16RW06-210419		16RW06-210727		16RW06-211025		16RW06-220125	
			Sample Date	3/17/2020		7/14/2020		10/26/2020		1/22/2021		4/19/2021		7/27/2021		10/25/2021		1/25/2022	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																			
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																			
	Dissolved oxygen	mg/L	NV	0.73		1.68		0.27		0.55		0.49		0.87		0.37		0.57	
	Oxidation Reduction Potential	mV	NV	134		136		69		91.1		-236		158		135		59	
	pH	STD UNIT	NV	5.99		5.94		6.27		6.61		5.61		6.03		5.75		6.03	
	Specific conductivity	µmhos/cm	NV	3.8		3.87		4.46		5.111		3.13		3.240		3.99		3.85	
	Temperature	C	NV	18.94		24.69		18.42		18.69		18.91		24.06		21.45		15.86	
	Total Purge	L	NV	3.0		3		3.0		4.5		3		1.00		NA		NA	
	Turbidity	NTU	NV	0		0		0		0		0		11		0		16	
	Water Level at Reading Time	Ft BTOC	NV	23.53		22.98		23.37		22.77		22.34		21.8		NA		NA	
GASES																			
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																			
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																			
	Perchlorate	µg/L	17	< 2	U	< 0.5	U	< 0.1	U	< 0.25	UJ	< 0.5	U	< 1	U	< 0.2	U	0.089	J
VOLATILES																			
	1,1,2-Trichloroethane	µg/L	NV	< 0.5	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	UJ	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	0.9	J	1		1.3		1.3		0.82	J	< 0.5	UJ	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	1.9		2.4		4.8		3.3		1.7		4.4	J	6.8		5.3	
	Methylene chloride	µg/L	NV	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 1	UJ	< 1	U	< 2	U
	Trichloroethene	µg/L	5	86		77	J+	110		95		60		64	J	34		37	
	Vinyl chloride	µg/L	2	0.84	J	1.2		2.5		2.2		< 0.5	U	< 0.5	UJ	< 0.5	U	1.2	

Table 2-5
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #3, LHAAP-16

			Location Code	16RW07															
			Sample ID	16RW07-200317		16RW07-200714		16RW07-200714-FD		16RW07-201026		16RW07-210122		16RW07-210419		16RW07-210727		16RW07-211025	
			Sample Date	3/17/2020		7/14/2020		7/14/2020		10/26/2020		1/22/2021		4/19/2021		7/27/2021		10/25/2021	
			Sample Purpose	REG		REG		FD		REG		REG		REG		REG		REG	
			Location Description	Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																			
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																			
	Dissolved oxygen	mg/L	NV	0.09		0.48		0.48		0.91		0.58		0.98		1.55		0.86	
	Oxidation Reduction Potential	mV	NV	-26		86		86		143		70.1		-195		128		117	
	pH	STD UNIT	NV	6.41		5.96		5.96		5.6		6.52		5.73		6.02		6.23	
	Specific conductivity	µmhos/cm	NV	4.21		3.66		3.66		3.07		4.879		3.36		2.97		2.87	
	Temperature	C	NV	20.02		29.76		29.76		17.32		18.27		20.85		22.99		24.12	
	Total Purge	L	NV	3.0		3.0		3.0		3.0		5.5		3.0		3.00		NA	
	Turbidity	NTU	NV	0		0		0		0		0		0		11.8		0	
	Water Level at Reading Time	Ft BTOC	NV	21.4		19.93		19.93		21.37		20.7		20.29		19.88		NA	
GASES																			
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																			
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																			
	Perchlorate	µg/L	17	4.9		2.45		2.33		0.391		0.638	J	1		< 0.5	U	0.262	J
VOLATILES																			
	1,1,2-Trichloroethane	µg/L	NV	< 2.5	U	< 5	U	< 5	U	< 1	U	< 5	U	< 1	U	< 1	UJ	< 5	U
	1,1-Dichloroethene	µg/L	7	12		13		15		6.4		13		4.8		4.1	J	4.1	J
	1,2-Dichloroethane	µg/L	5	< 2.5	U	< 2.5	U	< 2.5	U	< 0.5	U	< 2.5	U	< 0.5	U	< 0.5	UJ	< 2.5	U
	cis-1,2-Dichloroethene	µg/L	70	120		110		100		38		120		46		35	J	35	
	Methylene chloride	µg/L	NV	< 5	U	< 5	U	< 5	U	< 1	U	< 10	U	< 2	U	< 1	UJ	< 5	U
	Trichloroethene	µg/L	5	1,900		2,100		2,300		1,100		2,000		900		760	J	700	
	Vinyl chloride	µg/L	2	76		89		95		28		90		29		15	J	15	

Table 2-5
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #3, LHAAP-16

			Location Code	16RW07		16RW09													
			Sample ID	16RW07-220125		16RW09-200311		16RW09-200714		16RW09-201026		16RW09-210202		16RW09-210420		16RW09-210714		16RW09-210727	
			Sample Date	1/25/2022		3/11/2020		7/14/2020		10/26/2020		2/2/2021		4/20/2021		7/14/2021		7/27/2021	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																			
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																			
	Dissolved oxygen	mg/L	NV	0.48		0.04		0.03		0.14		0.11		0.16		NA		0.5	
	Oxidation Reduction Potential	mV	NV	87		53		128		208		-14		127		NA		30	
	pH	STD UNIT	NV	6.07		6.69		5.95		5.56		5.65		5.82		NA		6.69	
	Specific conductivity	µmhos/cm	NV	2.82				4.27		3.96		3.83		3.18		NA		3.93	
	Temperature	C	NV	17.22				22.88		18.96		15.16		20.42		NA		21.37	
	Total Purge	L	NV	NA				3.0		3		3.0		3		NA		2	
	Turbidity	NTU	NV	0				0		0		0		0		NA		13.6	
	Water Level at Reading Time	Ft BTOC	NV	NA				23.61		24.24		23.55		22.93		NA		22.55	
GASES																			
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		< 0.5	U	NA		< 0.25	U
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		1.97	J	NA		1.25	J
	Methane	µg/L	NV	NA		NA		NA		NA		NA		144		NA		255	J
GEN CHEMISTRY																			
	Alkalinity	mg/L	NV	NA		NA													
	Bromide	mg/L	NV	NA		4.86		6.98		5.38		5.84		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		2.56		2.56		1.58		2.28		2.28		NA		2.52	
PERCHLORATE																			
	Perchlorate	µg/L	17	0.27		< 2	U	0.491	J	0.12	J	0.459	J	0.241		< 2	U	< 1	U
VOLATILES																			
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 0.5	U	< 5	U	< 0.5	U	< 5	U	< 1	U	< 1	U	< 5	U
	1,1-Dichloroethene	µg/L	7	3.4		7.5		9.9		7.5		6.8		4.8		< 0.5	U	9.6	
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 2.5	U	< 0.5	U	< 2.5	U	< 0.5	U	< 0.5	U	< 2.5	U
	cis-1,2-Dichloroethene	µg/L	70	38		34		45		290		230		160		0.69	J	180	
	Methylene chloride	µg/L	NV	< 2	U	< 1	U	< 5	U	< 1	U	< 10	U	< 2	U	< 1	U	< 5	U
	Trichloroethene	µg/L	5	540		1,300		1,300		980		690		810		1.1		1,400	
	Vinyl chloride	µg/L	2	15		41		52		33		25		33		< 0.5	U	59	

Table 2-5
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #3, LHAAP-16

		Location Code	16RW09				16RW10													
		Sample ID	16RW09-211026		16RW09-220126		16RW10-200311		16RW10-200720		16RW10-201026		16RW10-210202		16RW10-210420		16RW10-210727		16RW10-211026	
		Sample Date	10/26/2021		1/26/2022		3/11/2020		7/20/2020		10/26/2020		2/2/2021		4/20/2021		7/27/2021		10/26/2021	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG	
		Location Description	Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	0.31		0.41		0.86		0.07		0.04		0.09		0.16		0.82		0.2	
	Oxidation Reduction Potential	mV	NV	54		230		50		94		52		-30		58		62		97	
	pH	STD UNIT	NV	6.08		5.89		6.64		6.35		6.34		6.16		6.25		6.31		6.2	
	Specific conductivity	µmhos/cm	NV	4		3.78		1.91		5.38		5.58		3.17		4.37		4.18		4.79	
	Temperature	C	NV	19.07		14.86		18.39		21.72		18.13		13.97		18.38		23.94		19.11	
	Total Purge	L	NV	NA		NA		3		3.0		3.0		3.0		3		3.00		NA	
	Turbidity	NTU	NV	0		60.2		1.9		0.8		0		0.7		0		23.8		0	
	Water Level at Reading Time	Ft BTOC	NV	NA		NA		15.07		20.85		22.46		20.89		20.33		20.03		NA	
GASES																					
	Ethane	µg/L	NV	< 0.5	U	< 0.5	U	NA		NA		NA		NA		< 0.5	U	< 0.25	U	< 0.5	U
	Ethylene	µg/L	NV	2.6	J	2.54	J	NA		NA		NA		NA		26.1	J	10.4	J	5.19	J
	Methane	µg/L	NV	180		95.8		NA		NA		NA		NA		330		416	J	216	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV					NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		3.33		8.29		< 0.1	U	7.4		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	2.58		6.29		4.08		4.58		4.1		3.24		4.84		5.15		5.9	
PERCHLORATE																					
	Perchlorate	µg/L	17	< 0.2	U	< 0.2	U	150		62.7		8.11		125	J	36.5		18.7		27.8	
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 5	U	< 1	U	< 2.5	U	< 5	U	< 2.5	U	< 10	U	< 5	U	< 5	U	< 5	U
	1,1-Dichloroethene	µg/L	7	5.4		4.4		10		17		21		14		14		8.5		3.9	J
	1,2-Dichloroethane	µg/L	5	< 2.5	U	< 0.5	U	38		4	J	4.6	J	66		24		16		15	
	cis-1,2-Dichloroethene	µg/L	70	340		160		830		290		390		1,200		710		670		500	
	Methylene chloride	µg/L	NV	< 5	U	< 2	U	< 5	U	< 5	U	5.5	J	< 20	U	8.7	J	< 5	U	< 5	U
	Trichloroethene	µg/L	5	610		730		4,800		1,800		2,000		5,300		2,400		2,000		950	
	Vinyl chloride	µg/L	2	28		25		22		80		100		50		93		49		25	

Table 2-5
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #3, LHAAP-16

			Location Code	16RW10		16WW14															
			Sample ID	16RW10-220126		16WW14-181010		16WW14-190916		16WW14-200317		16WW14-200720		16WW14-201019		16WW14-210122		16WW14-210412		16WW14-210712	
			Sample Date	1/26/2022		10/10/2018		9/16/2019		3/17/2020		7/20/2020		10/19/2020		1/22/2021		4/12/2021		7/12/2021	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	0.61		0.44		0.88		0.03		0.26		0.37		0.93		0.47		0.74	
	Oxidation Reduction Potential	mV	NV	221		57.1		24		52		95		96		103.5		129		191	
	pH	STD UNIT	NV	6.26		5.93		6.17		6.41		6.24		6.02		6.67		5.97		5.74	
	Specific conductivity	µmhos/cm	NV	4.59		4.36		3.683		4.1		3.97		3.03		3.107		3.16		2.38	
	Temperature	C	NV	14.09		21.67		22.29		18.46		21.05		21.7		17.99		18.88		20.55	
	Total Purge	L	NV	NA		4.75		NA		3		3		3		6.25		3		1.5	
	Turbidity	NTU	NV	0		38.1		96.4		11.2		0.3		0		0		1.6		32.9	
	Water Level at Reading Time	Ft BTOC	NV	NA		26.96		25.19		24.66		24.03		24.32		23.93		23.5		22.8	
GASES																					
	Ethane	µg/L	NV	2.83		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	5.76	J	NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	413		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	5.35		NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																					
	Perchlorate	µg/L	17	4.1		< 2	U	< 2	U	< 2	U	0.544	J	< 0.05	U	< 0.05	UJ	< 0.05	U	0.21	
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	6.7		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	18		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	620		2.6		0.79	J	1.2		1.4		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Methylene chloride	µg/L	NV	16		< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 1	U
	Trichloroethene	µg/L	5	1,300		42		25		33		42		25		18		17		8.4	
	Vinyl chloride	µg/L	2	49		1.1		< 0.5	U	0.4	J	0.61	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-5
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #3, LHAAP-16

			Location Code	16WW14				16WW55													
			Sample ID	16WW14-211025		16WW14-220110		16WW55-181015		16WW55-190917		16WW55-200325		16WW55-200714		16WW55-201013		16WW55-210120		16WW55-210420	
			Sample Date	10/25/2021		1/10/2022		10/15/2018		9/17/2019		3/25/2020		7/14/2020		10/13/2020		1/20/2021		4/20/2021	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Upgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	NA		NA		< 0.5	U	NA		0.3	J	3.8		< 0.5	U	0.8		0.2	J
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	0.36		0.42		2.08		0.2		0.05		0.52		0.56		0.69		0.34	
	Oxidation Reduction Potential	mV	NV	196		165		319.9		90.7		134		182		60		153.5		189	
	pH	STD UNIT	NV	5.82		5.17		6.19		6.17		6.24		6.21		6.14		6.52		5.82	
	Specific conductivity	µmhos/cm	NV	2.79		3.93		6.130		4.821		5		4.88		4.67		5.689		4.72	
	Temperature	C	NV	22.02		13.45		19.10		21.85		18.01		24.15		17.91		17.1		17.62	
	Total Purge	L	NV	NA		NA		9.250		NA		3.0		3		3		3.75		3.0	
	Turbidity	NTU	NV	0		23.5		-8.6		0		0		0		0		0		0	
	Water Level at Reading Time	Ft BTOC	NV	NA		NA		23.01		20.94		20.35		19.84		20.53		20.09		19.42	
GASES																					
	Ethane	µg/L	NV	NA		NA		0.749	J	NA		0.607	J	0.682	J	< 0.25	U	0.25	J	< 0.5	U
	Ethylene	µg/L	NV	NA		NA		3.79		NA		2.06		2.76		1.07		0.92		< 0.5	UJ
	Methane	µg/L	NV	NA		NA		136		NA		70.1		82.2		30.1		63		7.09	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	NA		NA		347		NA		381		358		355		325		321	
	Bromide	mg/L	NV	NA		NA		2.12		NA		3.78		5.53		4.75		6.06		7.73	
	Chloride	mg/L	NV	NA		NA		1,000		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		0.152		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		< 0.1	U	NA		1.21		< 0.1	U	< 0.1	U	0.861		1.1	
	Nitrite	mg/L	1	NA		NA		< 0.1	U	NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		1,110		NA		770		982		745		1,020		862	
	Total organic carbon	mg/L	NV	NA		NA		7.32		NA		5.21		5.58		4.98		4.25		6.21	
PERCHLORATE																					
	Perchlorate	µg/L	17	< 0.2	U	0.21		400		480		360		263		287		259		198	
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 5	U	< 5	U	< 2.5	U	< 10	U	< 5	U	< 5	U	< 5	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 5	U	9.1	J	10		12		< 5	U	7.1		5.4	
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 5	U	5.3	J	5.8		6.9	J	12		4	J	3.6	J
	cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	0.63	J	540		310		380		440		450		340		270	
	Methylene chloride	µg/L	NV	< 1	U	< 2	U	< 10	U	< 10	U	< 5	U	< 10	U	< 10	U	< 10	U	< 10	U
	Trichloroethene	µg/L	5	12		17		5,900		3,200		4,300		4,500		4,400		2,900		2,200	
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 5	U	37		25		32		26		26		18	

Table 2-5
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #3, LHAAP-16

		Location Code	16WW55					
		Sample ID	16WW55-210713		16WW55-211014		16WW55-220112	
		Sample Date	7/13/2021		10/14/2021		1/12/2022	
		Sample Purpose	REG		REG		REG	
		Location Description	Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3		Shallow; Downgradient of Landfill Biobarrier #3	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC									
	Dehalococcoides	cells/mL	NV	0.3	J	< 0.5	U	< 0.5	U
FIELD TESTS									
	Dissolved oxygen	mg/L	NV	0.59		0.61		0.89	
	Oxidation Reduction Potential	mV	NV	217		183		64	
	pH	STD UNIT	NV	5.72		5.9		6.07	
	Specific conductivity	µmhos/cm	NV	4.94		4.09		4.2	
	Temperature	C	NV	19.86		22.29		16.09	
	Total Purge	L	NV	3		NA		NA	
	Turbidity	NTU	NV	3.3		1.1		0	
	Water Level at Reading Time	Ft BTOC	NV	18.88		NA		NA	
GASES									
	Ethane	µg/L	NV	0.642	J	< 0.5	U	< 0.5	U
	Ethylene	µg/L	NV	< 0.5	UJ	1.45	J	2.22	J
	Methane	µg/L	NV	18.2		10.9		26.8	
GEN CHEMISTRY									
	Alkalinity	mg/L	NV	333		303		305	
	Bromide	mg/L	NV	7.42		< 0.2	U	3.67	
	Chloride	mg/L	NV	NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA	
	Nitrate	mg/L	10	0.214		0.311		0.364	
	Nitrite	mg/L	1	NA		NA		NA	
	Sulfate	mg/L	NV	932		638		581	
	Total organic carbon	mg/L	NV	7.07		5.54		5.05	
PERCHLORATE									
	Perchlorate	µg/L	17	125		363		297	
VOLATILES									
	1,1,2-Trichloroethane	µg/L	NV	< 5	U	< 5	U	< 10	U
	1,1-Dichloroethene	µg/L	7	5.8		5.5		< 5	U
	1,2-Dichloroethane	µg/L	5	3.3	J	28		24	
	cis-1,2-Dichloroethene	µg/L	70	270		660		470	
	Methylene chloride	µg/L	NV	< 5	U	< 5	U	< 20	U
	Trichloroethene	µg/L	5	1,900		2,900		2,500	
	Vinyl chloride	µg/L	2	14		< 2.5	U	8.2	J

Table 2-5
Year 1 and Year 2 RA-O Analytical Results, Landfill Biobarrier #3, LHAAP-16

Notes:

COC concentrations highlighted in blue exceed the PCL/MCL.

µg/L - micrograms per liter

µS/cm - microsiemens per centimeter

J - The analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.

U - Not detected. The analyte was analyzed for, but not detected above the associated reporting limit.

cells/mL - cells per milliliter

deg. C - degrees Celsius

FD - field duplicate

Ft BTOC - feet below top of casing

Gal - gallons

ID - identifier

L - liters

MCL - maximum contaminant level

mg/L - milligrams per liter

mL/Min - milliliters per minute

mV - millivolts

NA - not analyzed

NTU - nephelometric turbidity unit

NV - no value

PCL - protective concentration level

RA-O - remedial action operation

Reg - regular sample

STD UNIT - standard unit

UTL - upper tolerance limit

Val Qual - validation qualifier

Table 2-6
Year 1 and Year 2 RA-O Analytical Results, Bayou Biobarrier, LHAAP-16

			Location Code	16IW20																16RW11			
			Sample ID	16IW20-200309		16IW20-200721		16IW20-201021		16IW20-210127		16IW20-210421		16IW20-210722		16IW20-211021		16IW20-220125		16RW11-200317		16RW11-200721	
			Sample Date	3/9/2020		7/21/2020		10/21/2020		1/27/2021		4/21/2021		7/22/2021		10/21/2021		1/25/2022		3/17/2020		7/21/2020	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Shallow; Bayou Biobarrier Area		Shallow; Bayou Biobarrier Area		Shallow; Bayou Biobarrier Area		Shallow; Bayou Biobarrier Area		Shallow; Bayou Biobarrier Area		Shallow; Bayou Biobarrier Area		Shallow; Bayou Biobarrier Area		Shallow; Bayou Biobarrier Area		Shallow; Within Bayou Biobarrier		Shallow; Within Bayou Biobarrier	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																							
	Dehalococcoides	cells/mL	NV	0.4	J	1.1		55,400		2,100		NA		NA		NA		NA		NA		NA	
FIELD TESTS																							
	Dissolved oxygen	mg/L	NV	2.6		0.04		0.07		0.5		0.04		0.4		0.15		0.44		0.07		0.24	
	Oxidation Reduction Potential	mV	NV	-230		-211		-23		-41.2		26		22		47		83		-82		-66	
	pH	STD UNIT	NV	6.49		6.00		6.20		6.44		5.98		6.21		5.98		6.4		6.28		6.46	
	Specific conductivity	µmhos/cm	NV	5.15		4.37		4.95		5.180		4.17		4.08		4.32		3.8		4.67		4.13	
	Temperature	deg. C	NV	16.9		21.63		19.96		17.39		16.98		24.10		19.15		16.15		19.38		21.75	
	Total Purge	L	NV	3		3		3.0		3.5		3		1		NA		NA		3.0		3	
	Turbidity	NTU	NV	21.5		18.3		9.5		7.1		49.1		43.5		3.7		20.1		34		20.4	
	Water Level at Reading Time	Ft BTOC	NV	16.07		16.6		17.4		16.25		15.86		16.03		NA		NA		17.47		17.51	
GASES																							
	Ethane	µg/L	NV	NA		3.87		4		1.1		< 0.5	U	< 0.25	U	< 0.5	U	< 0.5	U	NA		NA	
	Ethylene	µg/L	NV	NA		9.89		30.9		22		20.2	J	16	J	6.77	J	11.1	J	NA		NA	
	Methane	µg/L	NV	NA		1,450		2,400		2,900		2,240		2,170		1,370	J	2,080		NA		NA	
GEN CHEMISTRY																							
	Alkalinity	mg/L	NV	599		870		877		1,110		550		429		547		361		NA		NA	
	Bromide	mg/L	NV	13.4		37.5		34.9		46.7		12.3		6.43		13.3		6.27		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		< 0.1	U	< 0.1	U	0.0802	J	0.0503	J	< 0.5	U	< 0.5	U	0.09	J	NA		NA	
	Nitrite	mg/L	1	< 0.1	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	795		214		165		105		95.2		125		254		227		NA		NA	
	Total organic carbon	mg/L	NV	10.7		8.4		14.4		20.1		10.6		7.63		8.46		9.73		NA		NA	
PERCHLORATE																							
	Perchlorate	µg/L	17	< 2	U	0.562	J	< 0.05	U	< 0.5	UJ	< 0.05	U	< 0.5	U	< 0.2	U	< 0.2	U	< 2	U	< 0.05	U
VOLATILES																							
	1,1,2-Trichloroethane	µg/L	NV	< 0.5	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	UJ	< 1	U	< 0.5	U	< 1	U
	1,1-Dichloroethene	µg/L	7	5.4		3.5		1.6		< 0.5	UJ	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.5	U	0.56	J	< 0.5	U
	1,2-Dichloroethane	µg/L	5	6.2		4.4		2.7		0.92	J	0.7	J	0.56	J	< 0.5	UJ	< 0.5	U	1.6		1.6	
	cis-1,2-Dichloroethene	µg/L	70	57		170		170		47	J	30		7.2		1.9	J	1.1		73		60	J-
	Methylene chloride	µg/L	NV	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 1	U	< 1	UJ	< 2	U	< 1	U	< 1	U
	Trichloroethene	µg/L	5	850		280		130		13		5.7		7.6		1.2	J	0.96	J	20		8.9	J-
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	7.2	J	9.1		10		3.2	J	4.6		< 0.5	U	< 0.5	U

Table 2-6
Year 1 and Year 2 RA-O Analytical Results, Bayou Biobarrier, LHAAP-16

Location Code			16RW11																		
Sample ID			16RW11-201021		16RW11-201021-FD		16RW11-210203		16RW11-210421		16RW11-210421-FD		16RW11-210722-FD		16RW11-210722		16RW11-211021		16RW11-211021-FD		16RW11-220126	
Sample Date			10/21/2020		10/21/2020		2/3/2021		4/21/2021		4/21/2021		7/22/2021		7/22/2021		10/21/2021		10/21/2021		1/26/2022	
Sample Purpose			REG		FD		REG		REG		FD		FD		REG		REG		FD		REG	
Location Description			Shallow; Within Bayou Biobarrier		Shallow; Within Bayou Biobarrier		Shallow; Within Bayou Biobarrier		Shallow; Within Bayou Biobarrier		Shallow; Within Bayou Biobarrier		Shallow; Within Bayou Biobarrier		Shallow; Within Bayou Biobarrier		Shallow; Within Bayou Biobarrier		Shallow; Within Bayou Biobarrier		Shallow; Within Bayou Biobarrier	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																							
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																							
	Dissolved oxygen	mg/L	NV	0.04		0.04		0.04		0.03		0.03		0.29		0.29		0.27		0.27		0.36	
	Oxidation Reduction Potential	mV	NV	-18		-18		-220		-118		-118		-125		-125		-11		-11		101	
	pH	STD UNIT	NV	6.24		6.24		6.68		6.79		6.79		6.94		6.94		6.19		6.19		6.58	
	Specific conductivity	µmhos/cm	NV	4.45		4.45		4.04		4.05		4.05		4.07		4.07		4.04		4.04		3.82	
	Temperature	deg. C	NV	19.57		19.57		12.22		16.38		16.38		24.2		24.2		19.05		19.05		15.15	
	Total Purge	L	NV	3.0		3.0		3.0		3.0		3.0		1.5		1.5		NA		NA		NA	
	Turbidity	NTU	NV	33.1		33.1		33.1		24.3		24.3		26.1		26.1		7.9		7.9		87	
	Water Level at Reading Time	Ft BTOC	NV	18.13		18.13		17.16		16.7		16.7		16.65		16.65		NA		NA		NA	
GASES																							
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																							
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																							
	Perchlorate	µg/L	17	< 0.05	U	< 0.05	U	< 0.25	UJ	0.0617	J	< 0.1	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.2	U	< 0.2	U
VOLATILES																							
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	UJ	< 1	UJ	< 1	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.5	UJ	< 0.5	U
	1,2-Dichloroethane	µg/L	5	0.73	J	0.91	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.5	UJ	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	3.5		3.3		0.92	J	0.85	J	0.75	J	0.97	J	1.1		< 0.5	UJ	< 0.5	UJ	< 0.5	U
	Methylene chloride	µg/L	NV	< 1	U	< 1	U	< 2	U	< 2	U	< 2	U	< 1	U	< 1	U	< 1	UJ	< 1	UJ	< 2	U
	Trichloroethene	µg/L	5	3.7		3.3		2.2		2		1.9		2.1		2.3		1.3	J	1.2	J	1.1	
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	0.79	J	0.77	J	< 0.5	UJ	< 0.5	UJ	< 0.5	U

Table 2-6
Year 1 and Year 2 RA-O Analytical Results, Bayou Biobarrier, LHAAP-16

			Location Code	16RW11		16WW12															
			Sample ID	16RW11-220126-FD		16WW12-181012		16WW12-190918		16WW12-200311		16WW12-200721		16WW12-201021		16WW12-210203		16WW12-210421		16WW12-210728		16WW12-211021	
			Sample Date	1/26/2022		10/12/2018		9/18/2019		3/11/2020		7/21/2020		10/21/2020		2/3/2021		4/21/2021		7/28/2021		10/21/2021	
			Sample Purpose	FD		REG		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Shallow; Within Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																							
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																							
	Dissolved oxygen	mg/L	NV	0.36		0.36		0.34		0.61		0.07		0.25		0.08		0.03		0.78		0.27	
	Oxidation Reduction Potential	mV	NV	NA		NA		NA		158		68		72		55		130		83		165	
	pH	STD UNIT	NV	6.58		5.74		5.79		6.41		6.01		6.02		5.82		6.35		6.39		5.75	
	Specific conductivity	µmhos/cm	NV	3.82		6.607		5.774		5.73		5.73		5.91		5.58		5.70		5.32		5.47	
	Temperature	deg. C	NV	15.15		19.13		20.29		17.46		23.93		21.27		11		18.84		24.62		18.99	
	Total Purge	L	NV	NA		8.0		NA		3.0		3		3.0		3.0		3.0		2		NA	
	Turbidity	NTU	NV	87		0		16.5		26.8		7.8		18.8		107		89.3		43.2		18.9	
	Water Level at Reading Time	Ft BTOC	NV	NA		18.78		17.64		16.02		16.39		17.02		15.93		15.28		15.84		NA	
GASES																							
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																							
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		3.9		NA		3.71		6.16		5.76		5.7		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		7.08		8.72		3.98		3.73		NA		NA		NA	
PERCHLORATE																							
	Perchlorate	µg/L	17	< 0.2	U	12		120		53		61.5		18.5		24.1	J	42.1		16		23.2	
VOLATILES																							
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 5	U	< 2.5	U	< 2.5	U	< 5	U	< 5	U	< 1	U	< 10	U	< 5	U	< 10	UJ
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 5	U	4.9	J	3.6	J	7.5		3.8	J	3.2		5.4	J	4	J	< 5	UJ
	1,2-Dichloroethane	µg/L	5	< 0.5	U	16		9.2		7.5		12		5.5		4.3		7.3	J	5.8		5.1	J
	cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	86		52		48		71		67		84		76		64		69	J
	Methylene chloride	µg/L	NV	< 2	U	< 10	U	< 5	U	< 5	U	< 5	U	< 5	U	< 2	U	< 20	U	< 5	U	< 10	UJ
	Trichloroethene	µg/L	5	0.83	J	4,100		2,100		1,700		2,800		1,500		1,100		2,100		1,700		1,000	J
	Vinyl chloride	µg/L	2	< 0.5	U	12		5.5		3.4	J	8.1		5.8		4.8		8.2	J	5.5		4.6	J

Table 2-6
Year 1 and Year 2 RA-O Analytical Results, Bayou Biobarrier, LHAAP-16

		Location Code	16WW12		16WW21																	
		Sample ID	16WW12-220126		16WW21-181012		16WW21-200316		16WW21-200316-FD		16WW21-200715		16WW21-201014		16WW21-201014-FD		16WW21-210203		16WW21-210203-FD		16WW21-210415	
		Sample Date	1/26/2022		10/12/2018		3/16/2020		3/16/2020		7/15/2020		10/14/2020		10/14/2020		2/3/2021		2/3/2021		4/15/2021	
		Sample Purpose	REG		REG		REG		FD		REG		REG		FD		REG		FD		REG	
		Location Description	Shallow; Upgradient of Bayou Biobarrier		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																							
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																							
	Dissolved oxygen	mg/L	NV	0.49		0.82		0.88		0.88		0.41		0.23		0.23		0.12		0.12		0.41	
	Oxidation Reduction Potential	mV	NV	93		166.4		50		50		153		17		17		-152		-152		84	
	pH	STD UNIT	NV	6.47		5.52		7.89		7.89		5.67		6.55		6.55		6.50		6.50		5.51	
	Specific conductivity	µmhos/cm	NV	4.81		0.54		1.76		1.76		0.447		0.516		0.516		0.998		0.998		0.827	
	Temperature	deg. C	NV	14.69		20.15		16.93		16.93		21.68		21.85		21.85		16.13		16.13		18.67	
	Total Purge	L	NV	NA		4.5		0.5		0.5		3.0		3		3		3		3		3.0	
	Turbidity	NTU	NV	61.2		86.3		15.4		15.4		3.9		2.8		2.8		0.9		0.9		0	
	Water Level at Reading Time	Ft BTOC	NV	NA		26.9		23.99		23.99		23.77		24.52		24.52		23.68		23.68		23.03	
GASES																							
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																							
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		0.218		0.206		0.209		1.3		0.864		0.895		0.578		0.62		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		< 1.2	UJ	< 0.78	UJ	0.89		0.58		0.12	J	< 0.2	U	< 0.2	U	NA	
PERCHLORATE																							
	Perchlorate	µg/L	17	30.5		< 2	U	< 2	U	< 2	U	0.25		< 0.05	U	< 0.05	U	< 0.05	UJ	< 0.05	UJ	< 0.05	U
VOLATILES																							
	1,1,2-Trichloroethane	µg/L	NV	< 5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	< 2.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	4.8	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	77		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Methylene chloride	µg/L	NV	5.1	J	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 2	U
	Trichloroethene	µg/L	5	1,100		< 0.5	U	1.3		1.1		0.55	J	1.5		1.9		< 0.5	U	< 0.5	U	1.1	
	Vinyl chloride	µg/L	2	5	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-6
Year 1 and Year 2 RA-O Analytical Results, Bayou Biobarrier, LHAAP-16

			Location Code	16WW21						16WW22											
			Sample ID	16WW21-210720		16WW21-211019		16WW21-220113		16WW22-181010		16WW22-190917		16WW22-200316		16WW22-200715		16WW22-201014		16WW22-210125		16WW22-210415	
			Sample Date	7/20/2021		10/19/2021		1/13/2022		10/10/2018		9/17/2019		3/16/2020		7/15/2020		10/14/2020		1/25/2021		4/15/2021	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																							
	Dehalococcoides	cells/mL	NV	NA		NA		NA		5.2		NA		4.6		4		11.1		28.3		13.7	J
FIELD TESTS																							
	Dissolved oxygen	mg/L	NV	1.19		0.64		0.88		0.89		0.23		0.05		0.05		0.62		0.78		0.04	
	Oxidation Reduction Potential	mV	NV	30		33		112		68.3		-17.7		-5		51		8		51.1		110	
	pH	STD UNIT	NV	6.25		6.18		5.93		5.86		6.05		6.39		6.21		6.27		6.30		5.99	
	Specific conductivity	µmhos/cm	NV	0.504		0.586		0.673		5.988		3.671		4.07		3.65		3.97		3.89		3.53	
	Temperature	deg. C	NV	19.92		18.42		17.68		20.82		20.93		17.46		20.77		18.99		18.67		17.53	
	Total Purge	L	NV	2		NA		NA		5.25		NA		3		3		3.0		5.50		3.0	
	Turbidity	NTU	NV	1.7		0		0.7		135.7		28.4		16.3		8.3		13.3		7.7		30.3	
	Water Level at Reading Time	Ft BTOC	NV	22.95		NA		NA		29.53		27.85		26.74		26.16		26.91		26.13		25.76	
GASES																							
	Ethane	µg/L	NV	NA		NA		NA		< 1	U	NA		0.288	J	< 0.25	U	< 0.25	U	< 0.47	U	< 0.5	U
	Ethylene	µg/L	NV	NA		NA		NA		1.56		NA		1.68		1.16		< 0.5	U	< 0.55	U	1.24	J
	Methane	µg/L	NV	NA		NA		NA		2.46		NA		2.98		2.04		2.04		0.91	J	0.981	
GEN CHEMISTRY																							
	Alkalinity	mg/L	NV	NA		NA		NA		239		NA		168		204		183		200		252	
	Bromide	mg/L	NV	NA		NA		NA		4.46		NA		4		5.77		5.26		5.54		4.62	
	Chloride	mg/L	NV	NA		NA		NA		997		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		0.207		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		< 0.1	U	NA		< 0.5	U	< 0.1	U	< 0.1	U	0.186	J	0.0682	J
	Nitrite	mg/L	1	NA		NA		NA		< 0.1	U	NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		772		NA		368		283		163		307		209	
	Total organic carbon	mg/L	NV	NA		NA		NA		2.62		NA		2.35		1.23		0.81		1.13		1.49	
PERCHLORATE																							
	Perchlorate	µg/L	17	< 0.5	U	< 0.2	U	< 0.2	U	5.5		< 2	U	< 2	U	0.442	J	< 0.05	U	0.246	J	0.471	
VOLATILES																							
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	1.9		< 0.5	U	0.65	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	19		2.7		4.2		2.7		3		3.2		2	
	Methylene chloride	µg/L	NV	< 1	U	< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U
	Trichloroethene	µg/L	5	1		0.56	J	0.95	J	150		34		52		24		7.8		30		12	
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	4.5		0.44	J	0.69	J	< 0.5	U	< 0.5	U	0.49	J	< 0.5	U

Table 2-6
Year 1 and Year 2 RA-O Analytical Results, Bayou Biobarrier, LHAAP-16

			Location Code	16WW22						16WW39											
			Sample ID	16WW22-210720		16WW22-211019		16WW22-220111		16WW39-181010		16WW39-190917		16WW39-200316		16WW39-200715		16WW39-201014		16WW39-210203		16WW39-210415	
			Sample Date	7/20/2021		10/19/2021		1/11/2022		10/10/2018		9/17/2019		3/16/2020		7/15/2020		10/14/2020		2/3/2021		4/15/2021	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																							
	Dehalococcoides	cells/mL	NV	24.9		51.1		38		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																							
	Dissolved oxygen	mg/L	NV	0.64		0.19		0.61		0.48		0.23		0.08		0.05		0.25		0.03		0.14	
	Oxidation Reduction Potential	mV	NV	99		146		139		115.9		24.1		122		92		47		-50		117	
	pH	STD UNIT	NV	6.73		5.45		6.33		5.74		5.97		6.50		5.94		6.13		5.38		5.56	
	Specific conductivity	µmhos/cm	NV	3.45		3.35		3.43		5.745		5.599		5.61		5.58		6.23		5.83		5.88	
	Temperature	deg. C	NV	20.15		17.89		13.88		20.6		20.50		15.81		21.88		22.77		13.13		18.1	
	Total Purge	L	NV	2.50		NA		NA		4.125		NA		3		3.5		3.0		3.0		3.0	
	Turbidity	NTU	NV	36		2.6		38.3		15.7		105.3		40		67.5		17.6		29.2		1.7	
	Water Level at Reading Time	Ft BTOC	NV	25.55		NA		NA		22.04		20.66		19.34		19.03		19.7		18.87		18.54	
GASES																							
	Ethane	µg/L	NV	< 0.25	U	< 0.5	U	< 0.5	U	NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	0.673	J	0.951	J	1.04	J	NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	2.51		1.11		1.86	J	NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																							
	Alkalinity	mg/L	NV	243		205		214		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	4.85		1.8		3.44		4.2		NA		4.84		7.98		7.9		8.44		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	< 0.2	U	< 0.2	UJ	0.0496	J	NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	209		166		157		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	2.39		3.04		6.19		NA		NA		4.57		2.61		2.31		1.62	J	NA	
PERCHLORATE																							
	Perchlorate	µg/L	17	0.148		0.486		0.4		120		130		62		15.1		1.08		3.64	J	7.87	
VOLATILES																							
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 1	U	< 5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 5	U	2.7		2.3		2		1.7		0.84	J	0.75	J
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 5	U	2		1.7		1.2		1.3		0.72	J	0.72	J
	cis-1,2-Dichloroethene	µg/L	70	2.2		2.5		2.9		220		110		98		74		73		37		39	
	Methylene chloride	µg/L	NV	< 1	U	< 1	U	< 2	U	< 10	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	UJ	< 2	U
	Trichloroethene	µg/L	5	13		7.6		13		3,900		1,200		1,100		560		350		300		330	
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	15		7.1		5.3		3.3		5		2		1.1	

Table 2-6
Year 1 and Year 2 RA-O Analytical Results, Bayou Biobarrier, LHAAP-16

			Location Code	16WW39						16WW40											
			Sample ID	16WW39-210728		16WW39-211025		16WW39-220111		16WW40-181012-FD		16WW40-181012		16WW40-190917		16WW40-200310		16WW40-200721		16WW40-201021		16WW40-210203	
			Sample Date	7/28/2021		10/25/2021		1/11/2022		10/12/2018		10/12/2018		9/17/2019		3/10/2020		7/21/2020		10/21/2020		2/3/2021	
			Sample Purpose	REG		REG		REG		FD		REG		REG		REG		REG		REG		REG	
			Location Description	Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Upgradient of Bayou Biobarrier		Shallow; Downgradient of Bayou Biobarrier		Shallow; Downgradient of Bayou Biobarrier		Shallow; Downgradient of Bayou Biobarrier		Shallow; Downgradient of Bayou Biobarrier		Shallow; Downgradient of Bayou Biobarrier		Shallow; Downgradient of Bayou Biobarrier		Shallow; Downgradient of Bayou Biobarrier	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																							
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																							
	Dissolved oxygen	mg/L	NV	0.81		0.14		0.51		0.3		0.3		2.09		0.06		0.04		0.04		0.04	
	Oxidation Reduction Potential	mV	NV	120		111		176		-44.1		-44.1		7.8		78		-107		22		47	
	pH	STD UNIT	NV	5.57		5.9		5.87		5.90		5.90		5.88		6.3		6.12		6.21		5.46	
	Specific conductivity	µmhos/cm	NV	5.99		5.13		5.44		7.029		7.029		6.295		6.75		6.59		7.26		6.16	
	Temperature	deg. C	NV	22.80		23.71		15.21		21.27		21.27		24.23		20		20.85		20.91		14.27	
	Total Purge	L	NV	2.00		NA		NA		7		7		NA		3		3.0		3		3.0	
	Turbidity	NTU	NV	57.8		16.2		48.1		0		0		25.6		141		36.2		105		174	
	Water Level at Reading Time	Ft BTOC	NV	18.46		NA		NA		12.56		12.56		11.73		10.02		10.38		10.81		9.95	
GASES																							
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																							
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		NA		5.72		5.57		NA		4.2		8.9		6.97		9.31	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		9.79		8.66		7.35		7.61	
PERCHLORATE																							
	Perchlorate	µg/L	17	6.76		9.07		4		< 2	U	< 2	U	< 2	U	< 2	U	0.898	J	0.24		1.31	J
VOLATILES																							
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 5	U	< 2.5	U	< 5	U
	1,1-Dichloroethene	µg/L	7	0.58	J	0.61	J	< 0.5	U	3.5		3.5		3.7		5.8		7		7.5		5.3	
	1,2-Dichloroethane	µg/L	5	0.58	J	< 0.5	U	< 0.5	U	3.8		3.8		3.8		5.2		6.1		6		7	J
	cis-1,2-Dichloroethene	µg/L	70	29		28		10		240		220		130		160		220		230		150	
	Methylene chloride	µg/L	NV	< 1	U	< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 5	U	< 5	U	< 10	U
	Trichloroethene	µg/L	5	230		210	J	120		640		660		740		1,500		1,700		1,700		1,500	
	Vinyl chloride	µg/L	2	0.97	J	1.8		0.73	J	4.2		4.5		3		4.1		5.3		6.3		4.4	J

Table 2-6
Year 1 and Year 2 RA-O Analytical Results, Bayou Biobarrier, LHAAP-16

			Location Code	16WW40										16WW41							
			Sample ID	16WW40-210203-FD		16WW40-210421		16WW40-210727		16WW40-211021		16WW40-220126		16WW41-181009		16WW41-190917		16WW41-200316		16WW41-200715		16WW41-201014	
			Sample Date	2/3/2021		4/21/2021		7/27/2021		10/21/2021		1/26/2022		10/9/2018		9/17/2019		3/16/2020		7/15/2020		10/14/2020	
			Sample Purpose	FD		REG		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Shallow; Downgradient of Bayou Biobarrier		Shallow; Downgradient of Bayou Biobarrier		Shallow; Downgradient of Bayou Biobarrier		Shallow; Downgradient of Bayou Biobarrier		Shallow; Downgradient of Bayou Biobarrier		Intermediate; Upgradient of Bayou Biobarrier		Intermediate; Upgradient of Bayou Biobarrier		Intermediate; Upgradient of Bayou Biobarrier		Intermediate; Upgradient of Bayou Biobarrier		Intermediate; Upgradient of Bayou Biobarrier	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																							
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		< 0.5	U	NA		< 0.5	U	0.15	J	0.3	J
FIELD TESTS																							
	Dissolved oxygen	mg/L	NV	0.04		0.02		0.46		0.27		0.35		0.79		0.27		0.09		0.06		0.28	
	Oxidation Reduction Potential	mV	NV	47		135		79		89		85		266		109.5		82		149		10	
	pH	STD UNIT	NV	5.46		5.64		6.35		6		6.42		6.21		6.18		6.59		6.32		6.63	
	Specific conductivity	µmhos/cm	NV	6.16		6.22		6.36		5.75		4.98		14.58		14.22		15.5		15.1		16.3	
	Temperature	deg. C	NV	14.27		15.89		21.4		20.09		15.13		22.04		23.51		18.32		21.53		21.49	
	Total Purge	L	NV	3.0		3		2.00		NA		NA		4.725		NA		3.0		3.0		3	
	Turbidity	NTU	NV	174		118		78.3		20.2		284		86.2		106.8		14.1		2.2		4.5	
	Water Level at Reading Time	Ft BTOC	NV	9.95		9.73		10.06		NA		NA		28.24		28.06		25.17		24.53		26.04	
GASES																							
	Ethane	µg/L	NV	NA		< 0.5	U	0.953	J	1.67		< 0.5	U	0.281	J	NA		0.374	J	< 0.25	U	< 0.25	U
	Ethylene	µg/L	NV	NA		1.25	J	1.6	J	2.88	J	< 0.5	UJ	3.04		NA		9.96		10.2		10.7	
	Methane	µg/L	NV	NA		9.57		309	J	616	J	214		6.55		NA		16.3		16.6		14.5	
GEN CHEMISTRY																							
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		951		NA		1,010		1,040		1,000	
	Bromide	mg/L	NV	8.78		NA		NA		NA		NA		3.35		NA		< 0.5	U	5.9		< 0.5	U
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		733		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		0.204		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		< 0.2	U	NA		< 0.5	U	< 1	U	< 0.5	U
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		< 0.2	U	NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		9,260		NA		8,060		8,830		9,220	
	Total organic carbon	mg/L	NV	7.57		11.3		10.1		11.3		10.2		58		NA		44.8		42		40.8	
PERCHLORATE																							
	Perchlorate	µg/L	17	0.85	J	0.88		0.693	J	0.622		0.55		60		< 2	U	310		155		81.2	
VOLATILES																							
	1,1,2-Trichloroethane	µg/L	NV	< 5	U	< 5	U	< 1	U	< 10	UJ	< 1	U	< 5	U	< 5	U	< 2.5	U	< 20	U	< 5	U
	1,1-Dichloroethene	µg/L	7	4.3	J	2.8	J	7		< 5	UJ	1.5		17		11		14		24	J+	17	
	1,2-Dichloroethane	µg/L	5	6.8		5.6		6.4		5.2	J	3.7		< 5	U	< 5	U	4	J	< 10	U	5.7	J
	cis-1,2-Dichloroethene	µg/L	70	160		210		190		170	J	120		1,200		1,300		2,000		2,000	J+	2,400	
	Methylene chloride	µg/L	NV	< 10	U	< 10	U	< 1	U	< 10	UJ	< 2	U	< 10	U	< 10	U	< 5	U	< 20	U	< 10	U
	Trichloroethene	µg/L	5	1,400		1,000		1,900		1,000	J	540		9,800		3,900		6,400		6,200		5,400	
	Vinyl chloride	µg/L	2	4.5	J	5.4		9		< 5	UJ	2.9		110		80		120		160	J+	230	

Table 2-6
Year 1 and Year 2 RA-O Analytical Results, Bayou Biobarrier, LHAAP-16

			Location Code	16WW41										16WW56							
			Sample ID	16WW41-210125		16WW41-210415		16WW41-210720		16WW41-211019		16WW41-220113		16WW56-190917		16WW56-200316		16WW56-200715		16WW56-201021		16WW56-210125	
			Sample Date	1/25/2021		4/15/2021		7/20/2021		10/19/2021		1/13/2022		9/17/2019		3/16/2020		7/15/2020		10/21/2020		1/25/2021	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Intermediate; Upgradient of Bayou Biobarrier		Intermediate; Upgradient of Bayou Biobarrier		Intermediate; Upgradient of Bayou Biobarrier		Intermediate; Upgradient of Bayou Biobarrier		Intermediate; Upgradient of Bayou Biobarrier		Shallow; Downgradient of Bayou Biobarrier		Shallow; Downgradient of Bayou Biobarrier		Shallow; Downgradient of Bayou Biobarrier		Shallow; Downgradient of Bayou Biobarrier		Shallow; Downgradient of Bayou Biobarrier	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																							
	Dehalococcoides	cells/mL	NV	0.3	J	< 0.5	UJ	0.4	J	< 0.5	U	0.5	J	NA		8.8		27.4		41.5		65.3	
FIELD TESTS																							
	Dissolved oxygen	mg/L	NV	0.67		0.02		0.61		0.2		0.56		0.22		0.55		1.48		0.31		0.64	
	Oxidation Reduction Potential	mV	NV	61.5		143		122		208		44		33.7		2		105		233		204.7	
	pH	STD UNIT	NV	6.61		6.65		6.96		5.84		6.57		6.05		6.75		6.67		6.4		6.33	
	Specific conductivity	µmhos/cm	NV	17.25		15		14.80		16.8		13.6		3.440		6.69		3.16		6.06		3.893	
	Temperature	deg. C	NV	18.96		18.12		20.12		18.28		17.11		23.18		15.61		24.66		19.88		18.84	
	Total Purge	L	NV	5.0		3		1.00		NA		NA		NA		3.0		0.5		3.0		6.4	
	Turbidity	NTU	NV	4.1		2.5		0		3.1		40.1		2.6		7.3		7.3		0		0	
	Water Level at Reading Time	Ft BTOC	NV	24.71		24.07		23.97		NA		NA		26.7		25.79		25.47		26.46		25.15	
GASES																							
	Ethane	µg/L	NV	0.54	J	< 0.5	U	< 0.25	U	< 0.5	U	< 0.5	U	NA		0.417	J	< 0.25	U	< 0.25	U	< 0.47	U
	Ethylene	µg/L	NV	110		14.3	J	13.8	J	4.41	J	8.32	J	NA		5.17		0.93	J	2.01	J+	0.36	J
	Methane	µg/L	NV	180		16		13.5		3.37		7.22		NA		4.94		1.39		1.26		0.57	J
GEN CHEMISTRY																							
	Alkalinity	mg/L	NV	1,010		1,040		983		850		908		NA		389		178		233		188	
	Bromide	mg/L	NV	< 1	U	9.79		1.92		< 0.5	U	< 1	U	NA		3.19		5.2		3.95	J+	5.1	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	0.188	J	NA		< 0.5	U	< 0.1	U	< 0.1	U	0.213	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	9,300		7,890		7,670		1,450		6,990		NA		2,090		140		1,190		252	
	Total organic carbon	mg/L	NV	49.6		47.6		52.4		37.9		43		NA		10.7		0.93		0.72		1.17	
PERCHLORATE																							
	Perchlorate	µg/L	17	3.71	J	212		107		66.5		59.1		< 2	U	< 2	U	< 0.5	U	0.309		< 0.1	UJ
VOLATILES																							
	1,1,2-Trichloroethane	µg/L	NV	< 10	U	< 5	U	< 10	U	< 10	U	< 10	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 1	U
	1,1-Dichloroethene	µg/L	7	20		19		17		< 5	U	12		< 0.5	U	2.9		< 0.5	U	1.5		< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 5	U	4.2	J	< 5	U	< 5	U	< 5	U	< 0.5	U	3.4		< 0.5	U	0.66	J	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	2,400		2,600		2,300		920		1,600		1.7		44		< 0.5	U	20	J+	3.7	
	Methylene chloride	µg/L	NV	< 20	U	< 10	U	14	UB	< 10	U	< 20	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U
	Trichloroethene	µg/L	5	5,400		6,200		5,400		1,900		3,800		27		520		9.3		270		29	
	Vinyl chloride	µg/L	2	340		330		270		59		210		0.41	J	6.3		< 0.5	U	2.8		< 0.5	U

Table 2-6
Year 1 and Year 2 RA-O Analytical Results, Bayou Biobarrier, LHAAP-16

			Location Code	16WW56							
			Sample ID	16WW56-210415		16WW56-210720		16WW56-211019		16WW56-220111	
			Sample Date	4/15/2021		7/20/2021		10/19/2021		1/11/2022	
			Sample Purpose	REG		REG		REG		REG	
			Location Description	Shallow; Downgradient of Bayou Biobarrier		Shallow; Downgradient of Bayou Biobarrier		Shallow; Downgradient of Bayou Biobarrier		Shallow; Downgradient of Bayou Biobarrier	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC											
	Dehalococcoides	cells/mL	NV	21.9	J	28.6		5.85		1.6	
FIELD TESTS											
	Dissolved oxygen	mg/L	NV	0.48		0.87		0.33		0.69	
	Oxidation Reduction Potential	mV	NV	199		188		253		131	
	pH	STD UNIT	NV	5.82		5.80		5.32		6.07	
	Specific conductivity	µmhos/cm	NV	3.07		2.93		2.89		2.87	
	Temperature	deg. C	NV	16.73		19.51		17.34		15.51	
	Total Purge	L	NV	3.0		0.5		NA		NA	
	Turbidity	NTU	NV	0		1.9		9.5		42	
	Water Level at Reading Time	Ft BTOC	NV	28.25		24.78		NA		NA	
GASES											
	Ethane	µg/L	NV	< 0.5	U	< 0.25	U	< 0.5	UJ	< 0.5	U
	Ethylene	µg/L	NV	< 0.5	UJ	0.714	J	< 0.5	UJ	1.19	J
	Methane	µg/L	NV	1.02	J	1.68	J	0.952	J	2.29	J
GEN CHEMISTRY											
	Alkalinity	mg/L	NV	170		168		186		165	
	Bromide	mg/L	NV	5.19		4.29		1.55		3.42	
	Chloride	mg/L	NV	NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA	
	Nitrate	mg/L	10	0.249		< 0.2	U	< 0.2	UJ	0.0514	J
	Nitrite	mg/L	1	NA		NA		NA		NA	
	Sulfate	mg/L	NV	137		123		137		106	
	Total organic carbon	mg/L	NV	1.8		1.78		1.34	J	1.14	
PERCHLORATE											
	Perchlorate	µg/L	17	0.0783	J	< 0.05	U	< 0.2	U	0.13	J
VOLATILES											
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	1.2		1.5		0.76	J	0.67	J
	Methylene chloride	µg/L	NV	< 2	U	< 1	U	< 1	U	< 2	U
	Trichloroethene	µg/L	5	14		12		6.2		7	
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Tabe 2-6
Year 1 and Year 2 RA-O Analytical Results, Bayou Biobarrier, LHAAP-16

Notes:

COC concentrations highlighted in blue exceed the PCL/MCL.

µg/L - micrograms per liter

µS/cm - microsiemens per centimeter

J - The analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.

U - Not detected. The analyte was analyzed for, but not detected above the associated reporting limit.

cells/mL - cells per milliliter

deg. C - degrees Celsius

FD - field duplicate

Ft BTOC - feet below top of casing

Gal - gallon

ID - identifier

L - liters

MCL - maximum contaminant level

mg/L - milligrams per liter

mL/Min - milliliters per minute

mV - millivolts

NA - not analyzed

NTU - nephelometric turbidity unit

NV - no value

PCL - protective concentration level

RA-O - remedial action operation

Reg - regular sample

STD UNIT - standard unit

UTL - upper tolerance limit

Val Qual - validation qualifier

Table 2-7
Year 1 and Year 2 RA-O Analytical Results, Mid-Plume Area, Shallow Zone, LHAAP-16

			Location Code	16EW01																16EW02	
			Sample ID	16EW01-200309		16EW01-200716		16EW01-201020		16EW01-210125		16EW01-210421		16EW01-210713		16EW01-211020		16EW01-220113		16EW02-181009	
			Sample Date	3/9/2020		7/16/2020		10/20/2020		1/25/2021		4/21/2021		7/13/2021		10/20/2021		1/13/2022		10/9/2018	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	4.9		0.2	J	0.4	J	292		NA		NA		NA		NA		0.2	J
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	4.68		0.79		0.34		0.6		0.28		1.64		0.28		0.67		1.16	
	Oxidation Reduction Potential	mV	NV	-79		58		22		46.2		-18		25		77		42		80.2	
	pH	STD UNIT	NV	6.36		5.88		6.33		6.61		6.55		6.39		5.93		6.3		6	
	Specific conductivity	µmhos/cm	NV	7.41		7.43		9.17		10.33		7.81		5.99		7.09		6.86		4.950	
	Temperature	deg. C	NV	17.42		22.04		20.81		19.69		16.1		20.65		18.65		19.05		24.23	
	Total Purge	L	NV	3		3		3		7.6		3.0		2.50		NA		NA		3.75	
	Turbidity	NTU	NV	15.2		19.2		0		13.2		0		2.5		8.6		2.6		181.6	
	Water Level at Reading Time	Ft BTOC	NV	25.15		23.82		24.51		23.4		23.22		22.73		NA		NA		24.59	
GASES																					
	Ethane	µg/L	NV	3.01	J	0.603	J	< 2.5	U	< 0.47	U	< 0.5	U	< 0.25	U	< 0.5	U	< 0.5	U	1.16	
	Ethylene	µg/L	NV	92.8		105		112		9.1		102	J	20.2	J	50.9	J	51.8	J	8.81	
	Methane	µg/L	NV	82.6		177		182		11		406		89		122	J	122		33.6	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	396		418		517		891		529		397		610		598		438	
	Bromide	mg/L	NV	3.39		6.04		7.02		13.5		8.22		7.26		10.1		0.85		2.66	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		513	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		0.121	
	Nitrate	mg/L	10	< 0.1	U	< 0.5	U	< 0.5	U	1.46		0.494	J	1.66		< 0.5	U	0.22	J	< 0.1	U
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		< 0.2	U
	Sulfate	mg/L	NV	206		3,510		3,960		4,270		3,420		2,290		3,150		3,410		2,130	
	Total organic carbon	mg/L	NV	13.4		13.7		14.4		19.4		16.8		12.1		19.5		18.8		10.3	
PERCHLORATE																					
	Perchlorate	µg/L	17	28		28.4		27.5		180	J	41.9		29		40.3		61		< 2	U
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 5	U	< 20	U	< 12	U	< 10	U	< 25	U	< 10	U	< 10	U	< 10	U	< 25	U
	1,1-Dichloroethene	µg/L	7	27		36		29		24		22	J	7.4	J	6.8	J	9.6	J	100	
	1,2-Dichloroethane	µg/L	5	24		27		25		16		18	J	7.1	J	8	J	9.6	J	< 25	U
	cis-1,2-Dichloroethene	µg/L	70	6,500		6,800		7,600		7,200		6,000		2,000		3,400		3,600		16,000	
	Methylene chloride	µg/L	NV	< 10	U	< 20	U	< 25	U	< 20	U	< 50	U	< 10	U	< 10	U	< 20	U	< 50	U
	Trichloroethene	µg/L	5	3,700		4,700		5,400		4,100		3,500		990		970		1,800		24,000	
	Vinyl chloride	µg/L	2	530		780		630		820		720		100		180		260		470	

Table 2-7
Year 1 and Year 2 RA-O Analytical Results, Mid-Plume Area, Shallow Zone, LHAAP-16

Location Code				16EW02																
Sample ID				16EW02-190918		16EW02-200309		16EW02-200716		16EW02-200716-FD		16EW02-201021		16EW02-210126		16EW02-210419		16EW02-210726		16EW02-211020	
Sample Date				9/18/2019		3/9/2020		7/16/2020		7/16/2020		10/21/2020		1/26/2021		4/19/2021		7/26/2021		10/20/2021	
Sample Purpose				REG		REG		REG		FD		REG		REG		REG		REG		REG	
Location Description				Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	NA		3.6		5.9		NA		406		3600		NA		NA		NA	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	1.11		3.77		0.37		0.37		0.02		0.67		0.15		0.8		0.26	
	Oxidation Reduction Potential	mV	NV	171		55		191		191		43		65.6		43		44		15	
	pH	STD UNIT	NV	6.16		6.86		5.96		5.96		6.25		6.19		6.37		6.42		6.11	
	Specific conductivity	µmhos/cm	NV	5.59		4.17		4.48		4.48		4.72		7.645		4.15		3.800		4.61	
	Temperature	deg. C	NV	21.17		18.08		21.57		21.57		20.82		17.21		17		20.08		20	
	Total Purge	L	NV	3.5		3		3		3		3		7.9		3		2.50		NA	
	Turbidity	NTU	NV	0		21.65		5.7		5.7		0		1.7		0		4		0	
	Water Level at Reading Time	Ft BTOC	NV	24.77		NA		21.61		21.61		22.02		21.15		20.9		20.55		NA	
GASES																					
	Ethane	µg/L	NV	NA		0.463	J	0.275	J	0.349	J	< 0.25	U	0.71		NA		NA		NA	
	Ethylene	µg/L	NV	NA		1.58		0.627	J	1.12		1.54		26		NA		NA		NA	
	Methane	µg/L	NV	NA		4.34		5.65		6.34		9.39		130		NA		NA		NA	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	NA		418		407		411		328		473		NA		NA		NA	
	Bromide	mg/L	NV	NA		2.06		12.7		11.9		6.87		7.05		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		< 0.1	U	< 0.1	U	< 0.1	U	< 0.5	U	< 0.2	U	NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		1,260		1,650		1,590		1,380		2,950		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		6.48		8.37		8.3		7.36		12		NA		NA		NA	
PERCHLORATE																					
	Perchlorate	µg/L	17	< 2	U	25		16.2		9.34		< 0.05	U	< 0.5	U	0.53		0.984	J	2.53	
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 12	U	< 12	U	< 25	U	< 25	U	< 25	U	< 25	U	< 25	U	< 25	U	7.2	J
	1,1-Dichloroethene	µg/L	7	110		37		97		86		110		140		64		58		65	
	1,2-Dichloroethane	µg/L	5	51		22	J	43		39		48	J	55		35		29		37	
	cis-1,2-Dichloroethene	µg/L	70	25,000		11,000		22,000		21,000		26,000		35,000		18,000		18,000		22,000	
	Methylene chloride	µg/L	NV	< 25	U	< 25	U	< 25	U	< 25	U	< 50	U	< 50	U	41	J	< 25	U	< 10	U
	Trichloroethene	µg/L	5	42,000		17,000		37,000		35,000		26,000		38,000		23,000		25,000		23,000	
	Vinyl chloride	µg/L	2	650		< 12	U	39		28		51		930		45		42		630	

Table 2-7
Year 1 and Year 2 RA-O Analytical Results, Mid-Plume Area, Shallow Zone, LHAAP-16

			Location Code	16EW02		16EW03															
			Sample ID	16EW02-220112		16EW03-200325		16EW03-200728		16EW03-201022		16EW03-210202		16EW03-210421		16EW03-210722		16EW03-211020		16EW03-220127	
			Sample Date	1/12/2022		3/25/2020		7/28/2020		10/22/2020		2/2/2021		4/21/2021		7/22/2021		10/20/2021		1/27/2022	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	0.76		0.24		2.25		0.02		0.09		0.54		0.54		0.11		0.3	
	Oxidation Reduction Potential	mV	NV	69		-98		-263		-73		-189		-104		-78		-81		-95	
	pH	STD UNIT	NV	6.42		6.97		6.39		6.18		6.25		6.8		6.61		5.45		7.09	
	Specific conductivity	µmhos/cm	NV	4.24		4.3		5.50		5.98		5.62		4.42		5.21		6.1		5.78	
	Temperature	deg. C	NV	16.22		19.19		22.04		22.8		15.17		13.34		21.57		20.86		16.7	
	Total Purge	L	NV	NA		3		3		3		3.0		3		1.5		NA		NA	
	Turbidity	NTU	NV	1.1		17.5		68		91.3		8.2		0		0.4		8.2		162	
	Water Level at Reading Time	Ft BTOC	NV	NA		6.02		11.72		12.16		11		10.23		10.63		NA		NA	
GASES																					
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		< 0.5	U	< 0.25	U	< 0.5	U	< 0.5	U
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		527	J	701	J	131	J	175	J
	Methane	µg/L	NV	NA		NA		NA		NA		NA		528		1,140		164	J	574	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		961		1,140		1,050		1,160	
	Bromide	mg/L	NV	NA		NA		NA		NA		NA		5.93		3.7		9.02		7.37	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.1	U
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		1,090		1,350		1,860		1,920	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		12.2		14.8		67		20.9	
PERCHLORATE																					
	Perchlorate	µg/L	17	1.6		< 10	U	2.09		< 0.1	U	< 0.5	UJ	< 0.05	U	< 0.5	U	< 0.2	U	< 0.2	U
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 25	U	< 2.5	U	< 25	U	1.3		< 5	U	< 5	U	< 10	U	< 10	U	< 5	U
	1,1-Dichloroethene	µg/L	7	50		< 2.5	U	< 12	U	1.2		4	J	3.1	J	< 5	U	< 5	U	< 2.5	U
	1,2-Dichloroethane	µg/L	5	35		4.5	J	< 12	U	3.4		< 2.5	U	2.8	J	< 5	U	< 5	U	< 2.5	U
	cis-1,2-Dichloroethene	µg/L	70	16,000		1,700	J-	440		1,400		1,100		1,200		1,500		270		1,000	
	Methylene chloride	µg/L	NV	< 50	U	< 5	U	< 25	U	< 1	U	< 10	U	< 10	U	15	UB	< 10	U	< 10	U
	Trichloroethene	µg/L	5	19,000		170		60		130		290		250		77		54		84	
	Vinyl chloride	µg/L	2	340		750		< 12	U	200		780		460		310		92		230	

Table 2-7
Year 1 and Year 2 RA-O Analytical Results, Mid-Plume Area, Shallow Zone, LHAAP-16

Location Code				16EW04															16WW30	
Sample ID				16EW04-200309		16EW04-200728		16EW04-201020		16EW04-210202		16EW04-210419		16EW04-210726		16EW04-211020		16EW04-220112		16WW30-181012	
Sample Date				3/9/2020		7/28/2020		10/20/2020		2/2/2021		4/19/2021		7/26/2021		10/20/2021		1/12/2022		10/12/2018	
Sample Purpose				REG		REG		REG		REG		REG		REG		REG		REG		REG	
Location Description				Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Inside Mid-Plume ISB Area		Shallow; Performance Well; Downgradient of	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	2.78		0.11		0.02		0.03		0.15		1.88		0.34		0.79		1.3	
	Oxidation Reduction Potential	mV	NV	65		82		-105		-54		73		145		115		43		50.1	
	pH	STD UNIT	NV	7.26		5.91		6.70		5.66		5.81		6.64		5.95		6.11		5.83	
	Specific conductivity	µmhos/cm	NV	1.93		4.14		1.38		5.40		4.47		1.57		2.46		3.19		3.881	
	Temperature	deg. C	NV	16.9		22.72		21.16		12.72		14.61		21.06		22.33		17.85		19.27	
	Total Purge	L	NV	3		3.0		3.0		3.0		3		3.00		NA		NA		5.625	
	Turbidity	NTU	NV	2.5		47.3		7.2		147		31.1		155		13.4		48		177.1	
	Water Level at Reading Time	Ft BTOC	NV	6.2		6.76		7.3		6.22		5.19		5.83		NA		NA		9.56	
GASES																					
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	0.637		NA		NA		NA		NA		NA		NA		NA		3.22	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	3.4		NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																					
	Perchlorate	µg/L	17	< 2	U	1.42		< 0.05	U	< 0.5	UJ	< 0.05	U	< 0.5	U	< 0.2	U	< 0.2	U	< 2	U
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 2.5	U	< 25	U	< 5	UJ	< 10	U	< 10	U	< 5	U	< 10	U	< 10	U	< 0.5	U
	1,1-Dichloroethene	µg/L	7	3	J	20	J	5.9	J-	16		11		3.2	J	5.6	J	5.5	J	< 0.5	U
	1,2-Dichloroethane	µg/L	5	2.5	J	13	J	< 5	UJ	13		6.2	J	< 2.5	U	< 5	U	< 5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	960		4,300		4,400		4,800		2,600		640		1,300		1,300		< 0.5	U
	Methylene chloride	µg/L	NV	< 5	U	< 25	U	< 10	UJ	< 20	U	17	J	< 5	U	< 10	U	< 20	U	< 1	U
	Trichloroethene	µg/L	5	3,400		15,000		520	J-	17,000		9,500		3,100		5,100		3,400		1.8	
	Vinyl chloride	µg/L	2	< 2.5	U	15	J	< 5	UJ	29		11		2.5	J	15		11		< 0.5	U

Table 2-7
Year 1 and Year 2 RA-O Analytical Results, Mid-Plume Area, Shallow Zone, LHAAP-16

	Location Code			16WW30																
	Sample ID			16WW30-190918		16WW30-200330		16WW30-200715		16WW30-201014		16WW30-210121		16WW30-210420		16WW30-210720		16WW30-211014		16WW30-220112	
	Sample Date			9/18/2019		3/30/2020		7/15/2020		10/14/2020		1/21/2021		4/20/2021		7/20/2021		10/14/2021		1/12/2022	
	Sample Purpose			REG		REG		REG		REG		REG		REG		REG		REG		REG	
	Location Description			Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	0.22		0.06		0.07		0.08		0.52		0.18		0.55		0.24		0.68	
	Oxidation Reduction Potential	mV	NV	-54.3		152		2		-27		-28.3		40		-34		11		67	
	pH	STD UNIT	NV	6.14		4.4		5.81		6.19		6.23		5.83		6.42		5.91		6.28	
	Specific conductivity	µmhos/cm	NV	1.269		0.693		1.99		2.52		2.673		2.06		1.51		1.61		1.78	
	Temperature	deg. C	NV	20.11		17.02		23.09		17.18		16.2		16.36		22.13		20.97		16.55	
	Total Purge	L	NV	NA		3.0		3		3.0		7		3.0		2.50		NA		NA	
	Turbidity	NTU	NV	3.2		212		19.5		87.2		21.1		207		84.1		21.1		150	
	Water Level at Reading Time	Ft BTOC	NV	17.33		4.98		5.63		6.98		4.78		4.7		4.95		NA		NA	
GASES																					
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		1.05		3.79		3.56		4.18		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		5.23		2.35		2.13		1.01		NA		NA		NA		NA	
PERCHLORATE																					
	Perchlorate	µg/L	17	< 2	U	< 2	U	0.309	J	< 0.05	U	< 0.05	U	< 0.05	U	< 0.05	U	< 0.2	UJ	< 0.2	U
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	0.82	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	79		< 0.5	U	< 0.5	U	< 0.5	U	0.77	J	< 0.5	U	< 0.5	U	1.2		1.1	J
	Methylene chloride	µg/L	NV	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 1	U	< 1	U	< 2	U
	Trichloroethene	µg/L	5	360		14		3.5		5.7		2.2		11		12		32		31	
	Vinyl chloride	µg/L	2	0.41	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-7
Year 1 and Year 2 RA-O Analytical Results, Mid-Plume Area, Shallow Zone, LHAAP-16

		Location Code		16WW48																
		Sample ID		16WW48-181018		16WW48-190918		16WW48-200330		16WW48-200330-FD		16WW48-200715		16WW48-201020		16WW48-210121		16WW48-210422		16WW48-210713	
		Sample Date		10/18/2018		9/18/2019		3/30/2020		3/30/2020		7/15/2020		10/20/2020		1/21/2021		4/22/2021		7/13/2021	
		Sample Purpose		REG		REG		REG		FD		REG		REG		REG		REG		REG	
		Location Description		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	0.3	J	NA		1		NA		0.5		1.9		25.8		192		4.6	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	0.98		0.25		0.08		0.08		0.04		0.03		1.78		0.47		0.95	
	Oxidation Reduction Potential	mV	NV	173.1		124.7		33		33		158		59		40.9		168		223	
	pH	STD UNIT	NV	5.75		5.8		5.60		5.60		5.57		6.26		6.37		6.20		6.18	
	Specific conductivity	µmhos/cm	NV	6.771		5.709		2.62		2.62		6.54		7.77		7.416		6.57		6.76	
	Temperature	deg. C	NV	19.79		21.39		17.21		17.21		22.19		21.04		17.18		18.06		21.03	
	Total Purge	L	NV	6.6		NA		3		3		3.0		3		5.50		3.0		2.50	
	Turbidity	NTU	NV	0		8.3		32.4		32.4		4.5		0		0		0		1.9	
	Water Level at Reading Time	Ft BTOC	NV	11.95		13.56		11.27		11.27		11.85		12.43		11.03		10.53		11.23	
GASES																					
	Ethane	µg/L	NV	0.174	J	NA		< 0.5	U	< 0.5	U	0.249	J	< 0.25	UJ	< 0.47	U	< 0.5	U	< 0.25	U
	Ethylene	µg/L	NV	2.19		NA		0.244	J	0.546	J	1.6		1.23	J-	< 0.55	U	< 0.5	UJ	6.87	J
	Methane	µg/L	NV	2.21		NA		1.12		1.48		2.69		3.53	J-	1.2	J	2.83		3.5	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	259		NA		312		313		312		351		358		356		379	
	Bromide	mg/L	NV	4.33		NA		4.55		4.62		9.4		7.35		7.43		7.59		7.85	
	Chloride	mg/L	NV	1090		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	0.181	J	NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	< 0.2		NA		< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	0.408		< 0.5	U	< 0.2	U
	Nitrite	mg/L	1	< 0.2		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	1,770		NA		2,020		2,010		2,330		2,490		2,380		2,300		2,550	
	Total organic carbon	mg/L	NV	8.78		NA		9.82		9.5		8.9		8.44		7.81		13.2		12.4	
PERCHLORATE																					
	Perchlorate	µg/L	17	14		< 2	U	120		110		157		167		122		94.7		53.7	
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 0.5		< 2.5	U	< 10	U	< 10	U	< 20	U	< 25	U	< 10	U	< 25	U	< 10	U
	1,1-Dichloroethene	µg/L	7	11		7		12	J	13	J	27		32		36		38		40	
	1,2-Dichloroethane	µg/L	5	12		7		19	J	18	J	34		44		36		39		34	
	cis-1,2-Dichloroethene	µg/L	70	2,600		1,800		5,000		4,800		9,500		16,000		15,000		17,000		18,000	
	Methylene chloride	µg/L	NV	< 1		< 5	U	< 20	U	< 20	U	< 20	U	< 25	U	< 20	U	< 50	U	< 10	U
	Trichloroethene	µg/L	5	8,800		3,700		7,100		6,900		9,000		14,000	J+	13,000		15,000		13,000	
	Vinyl chloride	µg/L	2	15		7.4		< 10	U	< 10	U	22		57		20		16	J	110	

Table 2-7
Year 1 and Year 2 RA-O Analytical Results, Mid-Plume Area, Shallow Zone, LHAAP-16

			Location Code	16WW48			
			Sample ID	16WW48-211019		16WW48-220113	
			Sample Date	10/19/2021		1/13/2022	
			Sample Purpose	REG		REG	
			Location Description	Shallow; Performance Well; Downgradient of		Shallow; Performance Well; Downgradient of	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual
DHC							
	Dehalococcoides	cells/mL	NV	923		563	
FIELD TESTS							
	Dissolved oxygen	mg/L	NV	0.46		0.7	
	Oxidation Reduction Potential	mV	NV	200		66	
	pH	STD UNIT	NV	5.97		6.33	
	Specific conductivity	µmhos/cm	NV	7.28		7.06	
	Temperature	deg. C	NV	18.6		18.39	
	Total Purge	L	NV	NA		NA	
	Turbidity	NTU	NV	0		1.7	
	Water Level at Reading Time	Ft BTOC	NV	NA		NA	
GASES							
	Ethane	µg/L	NV	2.36		< 0.5	U
	Ethylene	µg/L	NV	23.3	J	< 0.5	UJ
	Methane	µg/L	NV	6.74		2.69	
GEN CHEMISTRY							
	Alkalinity	mg/L	NV	409		411	
	Bromide	mg/L	NV	< 0.2	U	3.48	
	Chloride	mg/L	NV	NA		NA	
	Fluoride	mg/L	NV	NA		NA	
	Nitrate	mg/L	10	< 0.2	U	0.212	J
	Nitrite	mg/L	1	NA		NA	
	Sulfate	mg/L	NV	2,530		3,130	
	Total organic carbon	mg/L	NV	15.7		13.7	
PERCHLORATE							
	Perchlorate	µg/L	17	37.9		14.8	
VOLATILES							
	1,1,2-Trichloroethane	µg/L	NV	< 10	U	< 10	U
	1,1-Dichloroethene	µg/L	7	37		29	
	1,2-Dichloroethane	µg/L	5	35		33	
	cis-1,2-Dichloroethene	µg/L	70	17,000		13,000	
	Methylene chloride	µg/L	NV	< 10	U	< 20	U
	Trichloroethene	µg/L	5	15,000		13,000	
	Vinyl chloride	µg/L	2	170		48	

Table 2-7
Year 1 and Year 2 RA-O Analytical Results, Mid-Plume Area, Shallow Zone, LHAAP-16

Notes:

COC concentrations highlighted in blue exceed the PCL/MCL.

µg/L - micrograms per liter

µS/cm - microsiemens per centimeter

J - The analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.

U - Not detected. The analyte was analyzed for, but not detected above the associated reporting limit.

cells/mL - cells per milliliter

deg. C - degrees Celsius

FD - field duplicate

Ft BTOC - feet below top of casing

Gal - gallon

ID - identifier

L - liters

MCL - maximum contaminant level

mg/L - milligrams per liter

mL/Min - milliliters per minute

mV - millivolts

NA - not analyzed

NTU - nephelometric turbidity unit

NV - no value

PCL - protective concentration level

RA-O - remedial action operation

Reg - regular sample

STD UNIT - standard unit

UTL - upper tolerance limit

Val Qual - validation qualifier

Table 2-8
Year 1 and Year 2 RA-O Analytical Results, Mid-Plume Area, Intermediate Zone, LHAAP-16

			Location Code	16EW05														16EW06			
			Sample ID	16EW05-181011		16EW05-200330		16EW05-200716		16EW05-211021		16EW05-211021-FD		16EW05-220127		16EW05-220127-FD		16EW06-181009		16EW06-190918	
			Sample Date	10/11/2018		3/30/2020		7/16/2020		10/21/2021		10/21/2021		1/27/2022		1/27/2022		10/9/2018		9/18/2019	
			Sample Purpose	REG		REG		REG		REG		FD		REG		FD		REG		REG	
			Location Description	Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	NA		5,060		5,040		NA		NA		NA		NA		1.7		NA	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	0.74		0.07		0.04		0.4		0.4		0.35		0.35		0.95		0.53	
	Flow Rate	mL/Min	NV	125		100		100		NA		NA		NA		NA		125		100	
	Oxidation Reduction Potential	mV	NV	189.9		-47		-32		-78		-78		63		63		59.3		58	
	pH	SU	NV	6.17		5.25		5.65		5.19		5.19		5.27		5.27		5.84		6.18	
	Specific conductivity	µS/cm	NV	10.32		3.12		4.54		1.53		1.53		3.09		3.09		10.25		9.79	
	Temperature	C	NV	19.94		17.43		22.34		19.61		19.61		16.94		16.94		24.76		22.02	
	Total Purge	Gal	NV	4.125		3		3		NA		NA		NA		NA		4.125		3	
	Turbidity	NTU	NV	167.9		1,000		1,000		1,000		1,000		1,000		1,000		154.6		7.8	
	Water Level at Reading Time	Ft BTOC	NV	29.06		5.11		3		NA		NA		NA		NA		24.33		23.18	
GASES																					
	Ethane	µg/L	NV	NA		9.16		NA		NA		NA		34.2		35.2	J	0.31	J	NA	
	Ethylene	µg/L	NV	NA		2.22		NA		NA		NA		26.1	J	29.2	J	3.76		NA	
	Methane	µg/L	NV	NA		248		NA		NA		NA		6,440		7,470		8.39		NA	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	NA		102	U	66.2		Refer to note "a"		Refer to note "a"		346	J	501	J	438		NA	
	Bromide	mg/L	NV	3.1		5	U	19.8						70.2		70.1		3.38		NA	
	Chloride	mg/L	NV	NA		NA		NA						NA		NA		683		NA	
	Nitrate	mg/L	10	NA		5	U	0.995	U					< 0.2	U	0.156	J	< 0.2	U	NA	
	Sulfate	mg/L	NV	NA		25	U	64.7						104	J	2.4	J	6,120		NA	
	Total organic carbon	mg/L	NV	NA		300		NA		21,900		20,800		161,000		165,000		31		NA	
PERCHLORATE																					
	Perchlorate	µg/L	17	NA		< 20	U	0.16	J	0.164	J	< 0.2	U	0.16	J	0.19	J	< 2	U	42	
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	NA		< 50	UJ	< 100	U	< 10,000	UJ	< 10000	UJ	< 5000	U	< 5000	U	< 2.5	U	< 12	U
	1,1-Dichloroethene	µg/L	7	NA		< 50	UJ	< 100	U	< 5000	UJ	< 5000	UJ	< 2500	U	< 2500	U	25		22	J
	1,2-Dichloroethane	µg/L	5	NA		< 50	UJ	< 100	U	< 5000	UJ	< 5000	UJ	< 2500	U	< 2500	U	4.6	J	< 12	U
	cis-1,2-Dichloroethene	µg/L	70	NA		< 50	UJ	< 100	U	< 5000	UJ	< 5000	UJ	< 2500	U	< 2500	U	3,700		3,700	
	Methylene chloride	µg/L	NV	NA		< 100	UJ	< 100	U	< 10000	UJ	< 10000	UJ	< 10000	U	< 10000	U	< 5	U	< 25	U
	Trichloroethene	µg/L	5	NA		< 50	UJ	< 100	U	< 5000	UJ	< 5000	UJ	< 2500	U	< 2500	U	5,500		6,500	
	Vinyl chloride	µg/L	2	NA		< 50	UJ	< 100	U	< 5000	UJ	< 5000	UJ	< 2500	U	< 2500	U	240		190	

Table 2-8
Year 1 and Year 2 RA-O Analytical Results, Mid-Plume Area, Intermediate Zone, LHAAP-16

			Location Code	16EW06																	
			Sample ID	16EW06-200325		16EW06-200716		16EW06-201021		16EW06-201021-FD		16EW06-210202		16EW06-210202-FD		16EW06-210422		16EW06-210727		16EW06-211021	
			Sample Date	3/25/2020		7/16/2020		10/21/2020		10/21/2020		2/2/2021		2/2/2021		4/22/2021		7/27/2021		10/21/2021	
			Sample Purpose	REG		REG		REG		FD		REG		FD		REG		REG		REG	
			Location Description	Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	0.02		0.08		0.11		0.11		0.07		0.07		0.05		0.45		0.08	
	Flow Rate	mL/Min	NV	100		100		100		100		100		100		100		100.00		NA	
	Oxidation Reduction Potential	mV	NV	29		-41		-49		-49		-59		-59		-70		-83.00		-105	
	pH	SU	NV	4.52		5.87		5.93		5.93		5.87		5.87		5.73		6.21		5.2	
	Specific conductivity	µS/cm	NV	0.048		5.40		5.55		5.55		5.52		5.52		5.65		4.97		2.65	
	Temperature	C	NV	19.29		22.05		19.12		19.12		15.84		15.84		17.94		20.91		20.44	
	Total Purge	Gal	NV	3.0		3.0		3.0		3.0		3.0		3.0		3.0		2.00		NA	
	Turbidity	NTU	NV	1,000		1,000		1,000		1,000		1,000		1,000		1,000		1000.00		1,000	
	Water Level at Reading Time	Ft BTOC	NV	38.52		19.45		21.42		21.42		19.24		19.24		16.85		18.75		NA	
GASES																					
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		Refer to note "a"		Refer to note "a"		Refer to note "a"	
	Bromide	mg/L	NV	NA		NA		NA		NA		NA		NA							
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA							
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA							
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA							
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																					
	Perchlorate	µg/L	17	< 10	U	< 0.75	U	< 0.75	U	< 0.75	U	< 0.75	U	< 0.75	U	< 7.5	U	NA		< 0.2	UJ
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 50	U	< 100	U	< 250	U	< 500	U	< 500	U	< 500	U	< 1000	U	< 5000	UJ	< 5000	UJ
	1,1-Dichloroethene	µg/L	7	< 50	U	< 100	U	< 250	U	< 250	U	< 250	U	< 250	U	< 500	U	< 5000	UJ	< 2500	UJ
	1,2-Dichloroethane	µg/L	5	< 50	U	< 100	U	< 250	U	< 250	U	< 250	U	< 250	U	< 500	U	< 5000	UJ	< 2500	UJ
	cis-1,2-Dichloroethene	µg/L	70	160		470		750		520		400	J	520		< 500	U	< 5000	UJ	6,800	J
	Methylene chloride	µg/L	NV	< 100	U	82	J	< 500	U	< 500	U	< 1000	U	< 1000	U	< 2000	U	< 5000	UJ	< 5000	UJ
	Trichloroethene	µg/L	5	< 50	U	40	J	< 250	U	< 250	U	< 250	U	< 250	U	< 500	U	< 5000	UJ	3,000	J
	Vinyl chloride	µg/L	2	< 50	U	370		510		< 250	U	250	J	240	J	< 500	U	< 5000	UJ	< 2500	UJ

Table 2-8
Year 1 and Year 2 RA-O Analytical Results, Mid-Plume Area, Intermediate Zone, LHAAP-16

			Location Code	16EW06		16EW07													
			Sample ID	16EW06-220127		16EW07-181013		16EW07-200325		16EW07-200728		16EW07-201022		16EW07-210202		16EW07-210415		16EW07-210727		16EW07-211021	
			Sample Date	1/27/2022		10/13/2018		3/25/2020		7/28/2020		10/22/2020		2/2/2021		4/15/2021		7/27/2021		10/21/2021	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	0.27		1.62		0.05		0.33		0.47		0.4		0.38		0.45		0.14	
	Flow Rate	mL/Min	NV	NA		200		100		100		100		100		100		100		NA	
	Oxidation Reduction Potential	mV	NV	25		-130.9		-37		-247		-261		-257		-261		-244		-6	
	pH	SU	NV	5.89		7.12		5.10		5.53		5.59		5.45		5.37		5.31		5.47	
	Specific conductivity	µS/cm	NV	4.37		10.56		0.084		4.81		4.76		4.55		4.49		4.23		1.3	
	Temperature	C	NV	16.65		19.74		19.71		22.01		19.92		15.42		17.19		20.87		19.3	
	Total Purge	Gal	NV	NA		7.750		3.0		3		3		3		3		1.50		NA	
	Turbidity	NTU	NV	1,000		-1		1,000		1,000		1,000		1,000		1,000		1,000		1,000	
	Water Level at Reading Time	Ft BTOC	NV	NA		14.67		9.35		10.34		10.83		9.5		9.25		9.07		NA	
GASES																					
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	Refer to note "a"		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV			2.14		NA		NA		NA		NA		NA		NA		NA	
	Chloride	mg/L	NV			NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10			NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV			NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																					
	Perchlorate	µg/L	17	< 1	U	NA		< 10	U	4.68	J	< 0.75	U	< 0.75	U	0.375	J	< 0.75	U	0.22	J
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 4900	U	NA		< 50	U	< 980	U	< 500	U	< 500	U	< 1000	U	< 1000	UJ	< 10000	UJ
	1,1-Dichloroethene	µg/L	7	< 2400	U	NA		< 50	U	10,000	J-	< 250	U	< 250	U	< 500	U	< 500	UJ	< 5000	UJ
	1,2-Dichloroethane	µg/L	5	< 2400	U	NA		< 50	U	< 980	U	< 250	U	< 250	U	< 500	U	< 500	UJ	< 5000	UJ
	cis-1,2-Dichloroethene	µg/L	70	< 2400	U	NA		< 50	U	4,100	J-	< 250	U	< 250	U	< 500	U	< 500	UJ	< 5000	UJ
	Methylene chloride	µg/L	NV	< 9800	U	NA		< 100	U	< 980	U	< 500	U	< 1000	U	< 2000	U	< 1000	UJ	< 10000	UJ
	Trichloroethene	µg/L	5	< 2400	U	NA		100		5,000	J-	490	J	< 250	U	< 500	U	< 500	UJ	< 5000	UJ
	Vinyl chloride	µg/L	2	< 2400	U	NA		< 50	U	< 980	U	< 250	U	< 250	U	< 500	U	< 500	UJ	< 5000	UJ

Table 2-8
Year 1 and Year 2 RA-O Analytical Results, Mid-Plume Area, Intermediate Zone, LHAAP-16

			Location Code	16EW07		16EW08													
			Sample ID	16EW07-220125		16EW08-181013		16EW08-200331		16EW08-200728		16EW08-201020		16EW08-210202		16EW08-210419		16EW08-210726		16EW08-211020	
			Sample Date	1/25/2022		10/13/2018		3/31/2020		7/28/2020		10/20/2020		2/2/2021		4/19/2021		7/26/2021		10/20/2021	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-plume ISB Area	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	0.35		0.48		0.07		0.26		0.03		0.06		0.02		0.45		0.21	
	Flow Rate	mL/Min	NV	NA		140		100		100		100		100		100		100		NA	
	Oxidation Reduction Potential	mV	NV	14		-16		-27		-243		74		-122		-15		16		19	
	pH	SU	NV	5.43		6.23		5.20		5.85		4.97		5.00		5.26		5.350		4.95	
	Specific conductivity	µS/cm	NV	1.57		1.117		1.85		4.26		0.232		0.952		0.608		0.467		1.86	
	Temperature	C	NV	16.64		19.13		17.01		22.16		21.20		13.37		15.39		21.05		21.38	
	Total Purge	Gal	NV	NA		3.2		3.0		3		3		3.0		3.0		1.50		NA	
	Turbidity	NTU	NV	1,000		8.8		1,000		1,000		73.2		29.1		55.2		141		62.1	
	Water Level at Reading Time	Ft BTOC	NV	NA		9.61		4.22		6.36		7.11		4.99		3.97		3.63		NA	
GASES																					
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		1.11		< 0.5	U	16		9.59		7.93		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		800		711		332		445		NA		NA		NA	
PERCHLORATE																					
	Perchlorate	µg/L	17	< 2	U	NA		< 20	U	0.0836	J	< 0.05	U	< 0.05	UJ	< 0.05	U	< 0.05	U	< 0.2	U
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 10000	U	NA		< 100	U	< 50	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 5	U
	1,1-Dichloroethene	µg/L	7	< 5000	U	NA		< 50	U	< 25	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 2.5	U
	1,2-Dichloroethane	µg/L	5	< 5000	U	NA		< 50	U	< 25	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 2.5	U
	cis-1,2-Dichloroethene	µg/L	70	< 5000	U	NA		< 50	U	< 25	U	1.7		1	J	0.84	J	1.3		14	
	Methylene chloride	µg/L	NV	< 20000	U	NA		< 100	U	< 50	U	< 1	U	< 2	U	< 2	U	< 1	U	< 5	U
	Trichloroethene	µg/L	5	< 5000	U	NA		52	J	< 25	U	1.6		3.1		2.6		1.8		3.3	J
	Vinyl chloride	µg/L	2	< 5000	U	NA		< 50	U	< 25	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 2.5	U

Table 2-8
Year 1 and Year 2 RA-O Analytical Results, Mid-Plume Area, Intermediate Zone, LHAAP-16

			Location Code	16EW08		16WW29															
			Sample ID	16EW08-220112		16WW29-181015		16WW29-190918		16WW29-200330		16WW29-200715		16WW29-201014		16WW29-210121		16WW29-210420-FD		16WW29-210420	
			Sample Date	1/12/2022		10/15/2018		9/18/2019		3/30/2020		7/15/2020		10/14/2020		1/21/2021		4/20/2021		4/20/2021	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		FD		REG	
			Location Description	Intermediate; Inside Mid-plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	NA		0.5		NA		10.1		7.5		32.2		7.2		NA		19.9	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	0.47		1.16		0.42		0.04		0.07		3.01		4.79		0.04		0.04	
	Flow Rate	mL/Min	NV	NA		160		250		100		100		100		180		100		100	
	Oxidation Reduction Potential	mV	NV	76		25.1		-39.1		-44		-6		-2		138.3		-86		-86	
	pH	SU	NV	5.5		6.19		5.85		4.96		5.77		5.99		5.97		6.42		6.42	
	Specific conductivity	µS/cm	NV	2.07		0.522		1.427		3.13		3.52		3.92		0.949		3.77		3.77	
	Temperature	C	NV	17.8		18.39		20.60		17.19		23.37		16.71		15.24		16.02		16.02	
	Total Purge	Gal	NV	NA		5.8		NA		3.5		3.0		3		6.4		3		3	
	Turbidity	NTU	NV	180		0		5.1		173		4.6		38.2		89.6		71		71	
	Water Level at Reading Time	Ft BTOC	NV	NA		8.83		17.27		4.76		5.38		6.94		4.42		4.36		4.36	
GASES																					
	Ethane	µg/L	NV	NA		< 1	U	NA		0.275	J	0.26	J	< 0.25	U	< 0.47	U	< 0.5	U	< 0.5	U
	Ethylene	µg/L	NV	NA		1.87		NA		0.864	J	1.14		1.13		< 0.55	U	1.36	J	< 0.5	UJ
	Methane	µg/L	NV	NA		2.41		NA		35.5		31.3		15.3		8		30.2		30.6	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	NA		45.9		NA		65.2		24.4		71.8		26.2		35.4		41.4	
	Bromide	mg/L	NV	NA		0.218		NA		1.16		2.62		1.37		0.886		2.23		2.35	
	Chloride	mg/L	NV	NA		45.4		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		< 0.1	U	NA		< 0.1	U	< 0.2	U	< 0.2	U	0.273		< 0.5	U	< 0.5	U
	Sulfate	mg/L	NV	NA		99.2		NA		1,560		1,900		1,200		462		1,850		1,800	
	Total organic carbon	mg/L	NV	NA		1.8		NA		16		15.3		11.2		4.47		16.9		16.9	
PERCHLORATE																					
	Perchlorate	µg/L	17	< 0.2	U	< 2		< 2	U	< 2	U	< 0.5	U	< 0.05	U	< 0.05	U	< 0.05	U	< 0.05	U
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	11		8.4		< 0.5	U	< 0.5	U	< 0.5	U	1.1		1.8		< 0.5	U	< 0.5	U
	Methylene chloride	µg/L	NV	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 2	U
	Trichloroethene	µg/L	5	3.4		3.3		2.7		< 0.5	U	< 0.5	U	< 0.5	U	0.99	J	< 0.5	U	< 0.5	U
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-8
Year 1 and Year 2 RA-O Analytical Results, Mid-Plume Area, Intermediate Zone, LHAAP-16

			Location Code	16WW29										16WW49							
			Sample ID	16WW29-210720		16WW29-210720-FD		16WW29-211014		16WW29-211014-FD		16WW29-220112		16WW49-190919		16WW49-200316		16WW49-200727		16WW49-201020	
			Sample Date	7/20/2021		7/20/2021		10/14/2021		10/14/2021		1/12/2022		9/19/2019		3/16/2020		7/27/2020		10/20/2020	
			Sample Purpose	REG		FD		REG		FD		REG		REG		REG		REG		REG	
			Location Description	Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	25.1		NA		32.4		NA		43.8		NA		NA		NA		NA	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	0.48		0.48		0.43		0.43		0.44		0.44		0.08		0.04		0.09	
	Flow Rate	mL/Min	NV	100		100		NA		NA		NA		250		100		100		100	
	Oxidation Reduction Potential	mV	NV	-74		-74		-9		-9		-12		-27.3		-38		28		-23	
	pH	SU	NV	6.5		6.5		6.1		6.1		6.74		6.16		6.51		6.23		6.39	
	Specific conductivity	µS/cm	NV	3.700		3.700		2.83		2.83		3.68		2.474		3.08		2.67		3.03	
	Temperature	C	NV	21.40		21.40		21.97		21.97		16.64		20.3		18.09		20.51		19.86	
	Total Purge	Gal	NV	2.50		2.50		NA		NA		NA		NA		3.0		3.0		3.0	
	Turbidity	NTU	NV	41.7		41.7		6.2		6.2		37		26.8		6.8		25.2		0	
	Water Level at Reading Time	Ft BTOC	NV	4.8		4.8		NA		NA		NA		21.91		17.77		17.73		18.49	
GASES																					
	Ethane	µg/L	NV	< 0.25	U	< 0.25	U	< 0.5	U	< 0.5	U	< 0.5	U	NA		NA		NA		NA	
	Ethylene	µg/L	NV	< 0.5	UJ	1.72	J	3.66	J	2.32	J	0.859	J	NA		NA		NA		NA	
	Methane	µg/L	NV	21.5		22.3		19.8		21.4		29.1		NA		NA		NA		NA	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	36.5	J	22.5	J	24		26.5		23.4		NA		NA		NA		NA	
	Bromide	mg/L	NV	0.897		0.916		< 0.2	U	< 0.2	U	< 0.5	U	NA		2.16		3.01		2.66	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	< 0.5	U	< 0.5	U	< 0.2	U	< 0.2	U	0.254	J	NA		NA		NA		NA	
	Sulfate	mg/L	NV	1,790		1,790		1,700		1,890		1,950		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	17.4		17		16.8		18		22		NA		5.22		4.11		3.74	
PERCHLORATE																					
	Perchlorate	µg/L	17	< 0.25	U	< 0.25	U	< 0.2	U	< 0.2	U	< 0.2	U	< 2	U	< 2	U	2.41		< 0.05	U
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	0.77	J	0.77	J	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	0.86	J	0.85	J	0.77	J	0.66	J
	cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	130		270		170		190	
	Methylene chloride	µg/L	NV	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
	Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	0.64	J	< 0.5	U	< 0.5	U	260		8.3		36		4.8	
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	0.41	J	< 0.5	U

Table 2-8
Year 1 and Year 2 RA-O Analytical Results, Mid-Plume Area, Intermediate Zone, LHAAP-16

			Location Code	16WW49										16WW51							
			Sample ID	16WW49-210129		16WW49-210422		16WW49-210728		16WW49-211019		16WW49-220113		16WW51-190918		16WW51-200317		16WW51-200727		16WW51-200727-FD	
			Sample Date	1/29/2021		4/22/2021		7/28/2021		10/19/2021		1/13/2022		9/18/2019		3/17/2020		7/27/2020		7/27/2020	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		FD	
			Location Description	Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																					
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	1.48		1.11		0.95		0.35		0.45		0		0.07		0.1		0.1	
	Flow Rate	mL/Min	NV	100		100		100		NA		NA		250		100		100		100	
	Oxidation Reduction Potential	mV	NV	-11.4		130		143		140		100		-90.8		-84		21		21	
	pH	SU	NV	6.67		6.21		5.85		5.44		5.96		6.06		6.32		5.99		5.99	
	Specific conductivity	µS/cm	NV	2.938		2.59		2.52		2.5		2.62		3.227		3.56		3.35		3.35	
	Temperature	C	NV	18.18		18.05		22.74		19.26		18.38		20.77		19.22		21.47		21.47	
	Total Purge	Gal	NV	6		3.0		2.5		NA		NA		NA		3.0		3		3	
	Turbidity	NTU	NV	0		64.2		58.4		1.4		0		0		85.4		16.3		16.3	
	Water Level at Reading Time	Ft BTOC	NV	17.58		16.99		17.27		NA		NA		14.38		10.66		11.36		11.36	
GASES																					
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																					
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	3.12		NA		NA		NA		NA		NA		3.71		5.27		5.26	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	3.81		NA		NA		NA		NA		NA		4.43		4.55		4.57	
PERCHLORATE																					
	Perchlorate	µg/L	17	< 0.5	U	< 0.05	U	0.0291	J	< 0.2	U	< 0.2	U	< 2	U	< 2	U	2.86		2.82	
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 5	U	< 5	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	1.4		2.8	J	3.4	J
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 2.5	U	< 2.5	U
	cis-1,2-Dichloroethene	µg/L	70	120		100		77		72		60		9.1		25		54		57	
	Methylene chloride	µg/L	NV	< 2	U	< 2	U	< 1	U	< 1	U	< 2	U	< 1	U	< 1	U	< 5	U	< 5	U
	Trichloroethene	µg/L	5	2.5		11		19		30		46		90		830		1,300		1,300	
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 2.5	U	< 2.5	U

Table 2-8
Year 1 and Year 2 RA-O Analytical Results, Mid-Plume Area, Intermediate Zone, LHAAP-16

			Location Code	16WW51											
			Sample ID	16WW51-201020		16WW51-210129		16WW51-210415		16WW51-210720		16WW51-211019		16WW51-220113	
			Sample Date	10/20/2020		1/29/2021		4/15/2021		7/20/2021		10/19/2021		1/13/2022	
			Sample Purpose	REG		REG		REG		REG		REG		REG	
			Location Description	Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area		Intermediate; Inside Mid-Plume ISB Area	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC															
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA	
FIELD TESTS															
	Dissolved oxygen	mg/L	NV	0.18		0.54		0.51		0.63		0.52		0.54	
	Flow Rate	mL/Min	NV	100		100		100		100		NA		NA	
	Oxidation Reduction Potential	mV	NV	41		-58.3		70		-40		-24		57	
	pH	SU	NV	5.49		6.14		5.45		6.33		6.04		6.11	
	Specific conductivity	µS/cm	NV	3.97		3.859		3.34		3.50		3.7		3.55	
	Temperature	C	NV	21.01		16.29		17.91		21.45		19.74		18.48	
	Total Purge	Gal	NV	3.0		5.0		3.0		1.00		NA		NA	
	Turbidity	NTU	NV	25.8		0		82.1		12.1		1.7		17.2	
	Water Level at Reading Time	Ft BTOC	NV	12.32		10.27		10.17		11.4		NA		NA	
GASES															
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY															
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	4.65		5.58		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	4.52		3.9		NA		NA		NA		NA	
PERCHLORATE															
	Perchlorate	µg/L	17	< 0.05	U	< 0.5	U	0.306		< 0.05	U	< 0.2	U	< 0.2	U
VOLATILES															
	1,1,2-Trichloroethane	µg/L	NV	< 2.5	U	< 1	U	< 1	U	< 5	U	< 5	U	< 10	U
	1,1-Dichloroethene	µg/L	7	< 2.5	U	1.3		0.83	J	2.6	J	< 2.5	U	< 5	U
	1,2-Dichloroethane	µg/L	5	< 2.5	U	< 0.5	U	< 0.5	U	< 2.5	U	< 2.5	U	< 5	U
	cis-1,2-Dichloroethene	µg/L	70	50		86		44		71		140		220	
	Methylene chloride	µg/L	NV	< 5	U	< 2	U	< 2	U	6.8	UB	< 5	U	< 20	U
	Trichloroethene	µg/L	5	1,700		1,000		560		1,800		2,500		3,200	
	Vinyl chloride	µg/L	2	< 2.5	U	< 0.5	U	< 0.5	U	< 2.5	U	< 2.5	U	< 5	U

Table 2-8
Year 1 and Year 2 RA-O Analytical Results, Mid-Plume Area, Intermediate Zone, LHAAP-16

Notes:

COC concentrations highlighted in blue exceed the PCL/MCL.

[a] General chemistry samples from 16EW05, 16EW06 were collected. The sample matrix was very viscous during select sampling events and described by the lab as oil and grease. The samples were analyzed as solids with high dilution instead of liquids by the laboratory as a liquid due to the consistency.

The analytical data for these locations are not reported here, as the dilution and alternate method used make them unsuitable for comparison to the pre-remedy samples.

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U - Undetected: The analyte was analyzed for, but not detected.
µg/L - micrograms per liter
µS/cm - microsiemens per centimeter
C - degrees Celsius
cells/mL - cells per milliliter
FD - field duplicate
Ft BTOC - feet below top of casing
Gal - gallon
ID - identifier
ISB - in situ bioremediation
MCL - maximum contaminant level
mg/L - milligrams per liter
mL - milliliter
mL/Min - milliliters per minute
mV - millivolt
NA - not analyzed
NTU - nephelometric turbidity unit
NV - No value, PCL values are only shown for constituents of concern.
PCL - Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level.
RA-O - remedial action operation
Reg - regular sample
SU - standard unit
UTL - upper tolerance limit
Val Qual - validation qualifier

Table 2-9
Year 1 and Year 2 RA-O Analytical Results, Outside Treatment Areas, LHAAP-16

		Location Code	16WW23																			
		Sample ID	16WW23-181012		16WW23-190917		16WW23-200331		16WW23-200727		16WW23-201008		16WW23-210128		16WW23-210422		16WW23-210714		16WW23-211013		16WW23-220127	
		Sample Date	10/12/2018		9/17/2019		3/31/2020		7/27/2020		10/8/2020		1/28/2021		4/22/2021		7/14/2021		10/13/2021		1/27/2022	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
		Location Description	Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																							
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																							
	Dissolved oxygen	mg/L	NV	1.23		0.14		0.08		0.03		0.04		1.37		3.42		0.47		0.23		0.5	
	Oxidation Reduction Potential	mV	NV	13.2		8		2		17		-23		56.7		53		42		-5		90	
	pH	STD UNIT	NV	5.49		6.07		4.53		5.67		5.96		5.61		5.57		5.23		5.87		6.3	
	Specific conductivity	mS/cm	NV	7.916		2.43		2.33		2.63		3.88		2.649		2.39		1.02		3.85		3.75	
	Temperature	C	NV	19.18		21.45		16.82		21.1		19.48		14.39		14.78		21.70		20.94		14.3	
	Total Purge	L	NV	6.500		3.5		3.0		3.0		3.0		4.75		3		2.5		NA		NA	
	Turbidity	NTU	NV	183.8		32.8		289		8.3		14.7		47		36.3		53.9		5.7		101	
	Water Level at Reading Time	Ft BTOC	NV	9.64		8.54		4.13		5.78		6.65		4.4		4.11		5.47		NA		NA	
GASES																							
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																							
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																							
	Perchlorate	µg/L	17	< 2	U	< 2	U	< 20	U	< 0.05	U	< 0.05	U	0.346	J	< 0.05	U	< 2	U	< 0.2	UJ	< 1	U
VOLATILES																							
	1,1,2-Trichloroethane	µg/L	NV	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Methylene chloride	µg/L	NV	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 1	U	< 1	U	< 2	U
	Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	1.8		< 0.5	U
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-9
Year 1 and Year 2 RA-O Analytical Results, Outside Treatment Areas, LHAAP-16

		Location Code	16WW24																			
		Sample ID	16WW24-181009		16WW24-181009-FD		16WW24-190917		16WW24-200331-FD		16WW24-200331		16WW24-200727		16WW24-201008		16WW24-210128		16WW24-210422		16WW24-210714	
		Sample Date	10/9/2018		10/9/2018		9/17/2019		3/31/2020		3/31/2020		7/27/2020		10/8/2020		1/28/2021		4/22/2021		7/14/2021	
		Sample Purpose	REG		FD		REG		FD		REG		REG		REG		REG		REG		REG	
		Location Description	Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																							
	Dehalococcoides	cells/mL	NV	1.6		NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																							
	Dissolved oxygen	mg/L	NV	0.17		0.17		0.44		0.04		0.04		1.71		0.03		2.09		0.43		0.61	
	Oxidation Reduction Potential	mV	NV	282.6		282.6		357		356		356		402		225		189.3		482		301	
	pH	STD UNIT	NV	3.54		3.54		3.76		4.78		4.78		4.03		3.89		3.44		3.31		3.30	
	Specific conductivity	mS/cm	NV	2.542		2.542		2.22		2.22		2.22		2.33		3.12		3.349		3.22		2.91	
	Temperature	C	NV	23.49		23.49		21.57		16.01		16.01		24.27		20.8		14.25		14.78		21.32	
	Total Purge	L	NV	4		4		3.0		3		3		3.0		3.0		7.4		3.0		0.5	
	Turbidity	NTU	NV	0		0		6.2		4.2		4.2		1.1		0		0		17.9		0.5	
	Water Level at Reading Time	Ft BTOC	NV	11.1		11.1		10.48		3.48		3.48		6.19		7.45		3.58		3.76		6.48	
GASES																							
	Ethane	µg/L	NV	0.256	J	0.555	J	NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	1.39	J	1.24		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	1.65		3.27		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																							
	Alkalinity	mg/L	NV	< 5	U	< 5	U	NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	1.26		1.32		NA		NA		NA		NA		NA		NA		NA		NA	
	Chloride	mg/L	NV	287		284		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	0.326		0.33		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	< 0.1	U	< 0.1	U	NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	< 0.1	U	< 0.2	U	NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	905		898		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	2.76		2.65		NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																							
	Perchlorate	µg/L	17	< 2	U	< 2	U	< 2	U	< 2	U	< 2	U	2.38		< 0.05	U	< 0.5	U	< 0.05	U	< 0.5	U
VOLATILES																							
	1,1,2-Trichloroethane	µg/L	NV	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Methylene chloride	µg/L	NV	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 1	U
	Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-9
Year 1 and Year 2 RA-O Analytical Results, Outside Treatment Areas, LHAAP-16

	Location Code		16WW24				16WW27															
	Sample ID		16WW24-211013		16WW24-220127		16WW27-181012		16WW27-190917		16WW27-200312		16WW27-200312-FD		16WW27-200723		16WW27-201022		16WW27-201022-FD		16WW27-210128	
	Sample Date		10/13/2021		1/27/2022		10/12/2018		9/17/2019		3/12/2020		3/12/2020		7/23/2020		10/22/2020		10/22/2020		1/28/2021	
	Sample Purpose		REG		REG		REG		REG		REG		FD		REG		REG		FD		REG	
	Location Description		Shallow Zone		Shallow Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone	
Parameter	Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																						
Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																						
Dissolved oxygen	mg/L	NV	1		0.72		0.98		0.04		0.05		0.05		0.03		0.03		0.03		0.67	
Oxidation Reduction Potential	mV	NV	327		312		-11.4		-26		-52		-52		2		4		4		-28.8	
pH	STD UNIT	NV	3.52		3.76		5.54		5.99		6.17		6.17		5.83		5.99		5.99		5.87	
Specific conductivity	mS/cm	NV	2.34		2.36		8.499		3.63		3.56		3.56		3.82		4.24		4.24		4.156	
Temperature	C	NV	22.17		14.69		19.61		20.53		17.82		17.82		23.13		19.90		19.90		14.85	
Total Purge	L	NV	NA		NA		9.5		3		3		3		3.0		3		3		6.0	
Turbidity	NTU	NV	0		18		186.5		91.7		120		120		22.3		6.7		6.7		15.2	
Water Level at Reading Time	Ft BTOC	NV	NA		NA		9.32		8.38		4.52		4.52		5.49		6.74		6.74		4.27	
GASES																						
Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																						
Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Bromide	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																						
Perchlorate	µg/L	17	< 0.2	U	< 0.2	U	< 2	U	< 2	U	< 2	U	< 2	U	< 0.5	U	< 0.05	U	< 0.05	U	< 0.5	U
VOLATILES																						
1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 1	U
1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Methylene chloride	µg/L	NV	< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U
Trichloroethene	µg/L	5	1.2		< 0.5	U	< 0.5	U	< 0.5	U	1.1		1.3		< 0.5	U	1.2		1.1		< 0.5	U
Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-9
Year 1 and Year 2 RA-O Analytical Results, Outside Treatment Areas, LHAAP-16

			Location Code	16WW27								16WW31											
			Sample ID	16WW27-210422		16WW27-210728		16WW27-211018		16WW27-220125		16WW31-181010		16WW31-181010-FD		16WW31-200312		16WW31-200727		16WW31-201019		16WW31-210119	
			Sample Date	4/22/2021		7/28/2021		10/18/2021		1/25/2022		10/10/2018		10/10/2018		3/12/2020		7/27/2020		10/19/2020		1/19/2021	
			Sample Purpose	REG		REG		REG		REG		REG		FD		REG		REG		REG		REG	
			Location Description	Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																							
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																							
	Dissolved oxygen	mg/L	NV	0.3		1.49		4.72		0.68		0.71		0.71		0.04		0.22		0.12		0.98	
	Oxidation Reduction Potential	mV	NV	-20		23		11		63		219.1		219.1		101		129		89		182.5	
	pH	STD UNIT	NV	6.0		5.47		5.62		6.14		5.32		5.32		6.3		6.47		6.27		6.05	
	Specific conductivity	mS/cm	NV	3.99		2.86		4.27		3.2		1.417		1.417		1.16		0.932		0.984		1.16	
	Temperature	C	NV	14.97		21.97		21.09		16.95		22.25		22.25		20.79		20.11		20.60		16.48	
	Total Purge	L	NV	3.0		2		NA		NA		8		8		3.0		3		3		4.5	
	Turbidity	NTU	NV	80.2		37.3		6.2		77		55.9		55.9		29.9		1.6		0		0	
	Water Level at Reading Time	Ft BTOC	NV	4.18		5		NA		NA		31.55		31.55		28.87		28.59		29.23		28.56	
GASES																							
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																							
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																							
	Perchlorate	µg/L	17	< 0.05	U	< 0.25	U	< 0.2	U	< 0.2	U	< 2	U	< 2	U	< 2	U	1.31		< 0.05	U	< 0.05	U
VOLATILES																							
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 1	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Methylene chloride	µg/L	NV	< 2	U	< 1	U	< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U
	Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	1.1		< 0.5	U	< 0.5	U	< 0.5	U
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-9
Year 1 and Year 2 RA-O Analytical Results, Outside Treatment Areas, LHAAP-16

			Location Code	16WW31								16WW32											
			Sample ID	16WW31-210412		16WW31-210712		16WW31-211018		16WW31-220111		16WW32-181011		16WW32-200312		16WW32-200727		16WW32-201019		16WW32-210119		16WW32-210412	
			Sample Date	4/12/2021		7/12/2021		10/18/2021		1/11/2022		10/11/2018		3/12/2020		7/27/2020		10/19/2020		1/19/2021		4/12/2021	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																							
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																							
	Dissolved oxygen	mg/L	NV	0.86		0.85		0.57		0.64		1.94		0.64		2		0.34		1.04		0.66	
	Oxidation Reduction Potential	mV	NV	217		168		190		172		115.4		19		78		70		142.2		190	
	pH	STD UNIT	NV	5.60		6.15		5.4		5.82		5.64		6.71		6.58		6.52		6.40		5.76	
	Specific conductivity	mS/cm	NV	1.07		0.77		0.852		0.953		1.171		1.41		1.39		1.49		1.524		1.67	
	Temperature	C	NV	20.11		22.49		17.81		17.02		18.30		23.82		21.54		22.32		15.15		19.67	
	Total Purge	L	NV	3.0		0.5		NA		NA		6.0		3		3.0		3.0		4.6		3	
	Turbidity	NTU	NV	1.4		18.3		1.5		4.5		25.9		35.2		51.2		17.3		6.7		78.3	
	Water Level at Reading Time	Ft BTOC	NV	27.98		27.59		NA		NA		32.24		28.9		28.63		29.26		28.76		28.04	
GASES																							
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																							
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																							
	Perchlorate	µg/L	17	< 0.05	U	< 2.5	U	< 0.2	U	< 0.2	U	< 2		< 2	U	< 0.05	U	< 0.05	U	< 0.05	U	< 0.05	U
VOLATILES																							
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	0.8	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Methylene chloride	µg/L	NV	< 2	U	< 1	U	< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U
	Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	9.9		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-9
Year 1 and Year 2 RA-O Analytical Results, Outside Treatment Areas, LHAAP-16

			Location Code	16WW32						16WW33													
			Sample ID	16WW32-210712		16WW32-211018		16WW32-220110		16WW33-181010		16WW33-200312		16WW33-200723		16WW33-200723-FD		16WW33-201019		16WW33-210203		16WW33-210412	
			Sample Date	7/12/2021		10/18/2021		1/10/2022		10/10/2018		3/12/2020		7/23/2020		7/23/2020		10/19/2020		2/3/2021		4/12/2021	
			Sample Purpose	REG		REG		REG		REG		REG		REG		FD		REG		REG		REG	
			Location Description	Shallow Zone		Shallow Zone		Shallow Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																							
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																							
	Dissolved oxygen	mg/L	NV	0.67		0.39		0.76		1.39		0.06		0.03		0.03		0.11		0.11		0.08	
	Oxidation Reduction Potential	mV	NV	173		133		105		132.3		63		99		99		116		-56		239	
	pH	STD UNIT	NV	6.08		5.8		6.69		6.49		6.51		6.33		6.33		6.09		6.26		5.25	
	Specific conductivity	mS/cm	NV	1.74		1.52		1.51		2.174		2.08		1.79		1.79		1.97		2.16		1.95	
	Temperature	C	NV	20.27		17.29		16.7		20.40		20.17		21.35		21.35		20.02		16.98		18.72	
	Total Purge	L	NV	1		NA		NA		4		3.5		3.0		3.0		3		3		3.0	
	Turbidity	NTU	NV	118		61.3		50.3		49.2		64		39.2		39.2		13.4		26.3		24.3	
	Water Level at Reading Time	Ft BTOC	NV	27.5		NA		NA		31.75		29.06		28.5		28.5		29.18		28.45		28.1	
GASES																							
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																							
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																							
	Perchlorate	µg/L	17	< 5	U	< 0.2	U	0.089	J	< 2	U	< 2	U	< 0.5	U	< 0.5	U	0.0259	J	< 0.05	UJ	< 0.05	U
VOLATILES																							
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	13		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Methylene chloride	µg/L	NV	< 1	U	< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U
	Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	79		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-9
Year 1 and Year 2 RA-O Analytical Results, Outside Treatment Areas, LHAAP-16

		Location Code	16WW33						16WW34														
		Sample ID	16WW33-210712		16WW33-211018		16WW33-220110		16WW34-181010		16WW34-200312		16WW34-200723		16WW34-201019-FD		16WW34-201019		16WW34-210203		16WW34-210203-FD	
		Sample Date	7/12/2021		10/18/2021		1/10/2022		10/10/2018		3/12/2020		7/23/2020		10/19/2020		10/19/2020		2/3/2021		2/3/2021	
		Sample Purpose	REG		REG		REG		REG		REG		REG		FD		REG		REG		FD	
		Location Description	Intermediate Zone		Intermediate Zone		Intermediate Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																							
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																							
	Dissolved oxygen	mg/L	NV	0.74		0.38		0.44		0.92		0.85		0.57		0.36		0.36		0.04		0.04	
	Oxidation Reduction Potential	mV	NV	213		152		117		13.2		-18		77		139		139		-2		-2	
	pH	STD UNIT	NV	5.69		5.37		6.63		6.15		6.86		6.37		5.76		5.76		5.72		5.72	
	Specific conductivity	mS/cm	NV	1.91		1.91		2.08		1.305		1.22		1.12		1.22		1.22		1.48		1.48	
	Temperature	C	NV	19.59		16.67		16.77		20.63		21.25		21.65		20.88		20.88		16.23		16.23	
	Total Purge	L	NV	0.50		NA		NA		4.0		2.5		3.0		3		3		3.0		3.0	
	Turbidity	NTU	NV	29.7		13.2		23.1		84.1		62.2		21		0.6		0.6		2.9		2.9	
	Water Level at Reading Time	Ft BTOC	NV	27.58		NA		NA		31.82		28.94		28.42		29.05		29.05		28.49		28.49	
GASES																							
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																							
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																							
	Perchlorate	µg/L	17	< 5	U	< 0.2	U	0.12	J	< 2	U	< 2	U	< 0.5	U	< 0.05	U	< 0.05	U	< 0.05	UJ	< 0.05	UJ
VOLATILES																							
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	31		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Methylene chloride	µg/L	NV	< 1	U	< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U
	Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	130		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-9
Year 1 and Year 2 RA-O Analytical Results, Outside Treatment Areas, LHAAP-16

			Location Code	16WW34															16WW37			
			Sample ID	16WW34-210412		16WW34-210412-FD		16WW34-210712		16WW34-210712-FD		16WW34-211018		16WW34-211018-FD		16WW34-220110		16WW34-220110-FD		16WW37-181010		16WW37-200317	
			Sample Date	4/12/2021		4/12/2021		7/12/2021		7/12/2021		10/18/2021		10/18/2021		1/10/2022		1/10/2022		10/10/2018		3/17/2020	
			Sample Purpose	REG		FD		REG		FD		REG		FD		REG		FD		REG		REG	
			Location Description	Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Intermediate Zone		Intermediate Zone	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																							
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																							
	Dissolved oxygen	mg/L	NV	0.33		0.33		1.49		1.49		0.36		0.36		0.61		0.61		0.57		0.08	
	Oxidation Reduction Potential	mV	NV	154		154		195		195		171		171		132		132		48.3		-11	
	pH	STD UNIT	NV	5.55		5.55		5.93		5.93		5.34		5.34		6.4		6.4		6.73		7.17	
	Specific conductivity	mS/cm	NV	1.32		1.32		0.969		0.969		1.1		1.1		1.28		1.28		4.617		4.62	
	Temperature	C	NV	18.40		18.40		19.73		19.73		16.5		16.5		16.23		16.23		21.51		19.50	
	Total Purge	L	NV	3.0		3.0		2		2		NA		NA		NA		NA		3.5		3	
	Turbidity	NTU	NV	24.3		24.3		35.5		35.5		8.3		8.3		48.3		48.3		43.2		77.7	
	Water Level at Reading Time	Ft BTOC	NV	27.99		27.99		27.41		27.41		NA		NA		NA		NA		30.29		27.15	
GASES																							
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																							
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																							
	Perchlorate	µg/L	17	< 0.05	U	< 0.05	U	< 2.5	U	< 2.5	U	< 0.2	U	< 0.2	U	0.14	J	0.13	J	< 2	U	< 2	U
VOLATILES																							
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	0.82	J
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	5.2		6.1	
	Methylene chloride	µg/L	NV	< 2	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 1	U	< 1	U
	Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	0.51	J	< 0.5	U	84		110	
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	2.1	

Table 2-9
Year 1 and Year 2 RA-O Analytical Results, Outside Treatment Areas, LHAAP-16

			Location Code	16WW37													16WW38					
			Sample ID	16WW37-200723		16WW37-201019		16WW37-210120		16WW37-210412		16WW37-210712		16WW37-211025		16WW37-220110		16WW38-181010		16WW38-200317		16WW38-200723	
			Sample Date	7/23/2020		10/19/2020		1/20/2021		4/12/2021		7/12/2021		10/25/2021		1/10/2022		10/10/2018		3/17/2020		7/23/2020	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Shallow Zone		Shallow Zone		Shallow Zone	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																							
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																							
	Dissolved oxygen	mg/L	NV	0.67		0.15		0.58		0.19		0.92		0.54		0.63		0.38		0.07		1.17	
	Oxidation Reduction Potential	mV	NV	72		50		23.4		166		143		216		180		-44.9		-16		45	
	pH	STD UNIT	NV	6.96		6.23		6.82		5.96		6.37		5.79		5.24		5.94		6.50		6.37	
	Specific conductivity	mS/cm	NV	4.33		4.86		4.892		4.60		4.330		3.99		4.74		2.604		2.99		1.42	
	Temperature	C	NV	21.37		21.00		18.48		18.51		21.30		20.27		12.14		20.99		18.94		22.88	
	Total Purge	L	NV	3		3		4.0		3.0		0.50		NA		NA		3.5		3.0		3.0	
	Turbidity	NTU	NV	53		12.6		0		13.2		48.6		12		59.1		24.4		2.3		0.8	
	Water Level at Reading Time	Ft BTOC	NV	26.44		27.05		26.69		26.02		25.21		NA		NA		29.48		27.05		26.54	
GASES																							
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																							
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																							
	Perchlorate	µg/L	17	< 0.5	U	0.393		0.786		1.6		2.74		168		55.3		< 2	U	< 2	U	< 0.5	U
VOLATILES																							
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 5	U	< 2.5	U	< 5	U
	1,1-Dichloroethene	µg/L	7	0.76	J	0.64	J	0.7	J	0.9	J	< 0.5	U	< 0.5	U	< 0.5	U	21		13		17	
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 5	U	< 2.5	U	< 2.5	U
	cis-1,2-Dichloroethene	µg/L	70	5.7		5.9		6.5		5.8		5.4		15		13		240		200		940	
	Methylene chloride	µg/L	NV	< 1	U	< 1	U	< 2	U	< 2	U	< 1	U	< 1	U	< 2	U	< 10	U	< 5	U	< 5	U
	Trichloroethene	µg/L	5	87		120		99		110		89		190		180		4,400		3,000		2,400	
	Vinyl chloride	µg/L	2	0.41	J	1.4		3.1		2.2		< 0.5	U	4.2		4.9		160		95		57	

Table 2-9
Year 1 and Year 2 RA-O Analytical Results, Outside Treatment Areas, LHAAP-16

	Location Code		16WW38												16WW43							
	Sample ID		16WW38-201019		16WW38-210120		16WW38-210412		16WW38-210712		16WW38-211025		16WW38-220110		16WW43-181009		16WW43-190917		16WW43-200312		16WW43-200723	
	Sample Date		10/19/2020		1/20/2021		4/12/2021		7/12/2021		10/25/2021		1/10/2022		10/9/2018		9/17/2019		3/12/2020		7/23/2020	
	Sample Purpose		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
	Location Description		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone	
Parameter	Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																						
Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		2.1		NA		NA		NA	
FIELD TESTS																						
Dissolved oxygen	mg/L	NV	0.13		0.65		0.04		0.76		0.29		0.58		1.46		0.09		1.37		0.05	
Oxidation Reduction Potential	mV	NV	33		101.3		97		69		49		158		-1.7		42		62		56	
pH	STD UNIT	NV	6.35		6.51		5.62		6.53		6.15		5.07		6.12		5.92		6.24		5.83	
Specific conductivity	mS/cm	NV	1.58		2.942		1.43		1.500		1.03		1.65		.0300		0.307		0.275		0.268	
Temperature	C	NV	21.78		18.12		18.02		21.37		21.01		16.62		21.93		23.88		16.75		24.20	
Total Purge	L	NV	3		4.0		3.0		3.00		NA		NA		3.5		3.0		3		3	
Turbidity	NTU	NV	0		0		9.1		45.7		0.4		17.3		20.6		11.6		6		0.2	
Water Level at Reading Time	Ft BTOC	NV	26.88		26.56		25.93		25.3		NA		NA		11.37		10.15		4.74		6.6	
GASES																						
Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		< 1	U	NA		NA		NA	
Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		2.28		NA		NA		NA	
Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		133		NA		NA		NA	
GEN CHEMISTRY																						
Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		104		NA		NA		NA	
Bromide	mg/L	NV	NA		NA		NA		NA		NA		NA		0.173		NA		NA		NA	
Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		31.7		NA		NA		NA	
Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		0.181		NA		NA		NA	
Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		< 0.1	U	NA		NA		NA	
Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		< 0.1	U	NA		NA		NA	
Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		6.35		NA		NA		NA	
Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		9.46		NA		NA		NA	
PERCHLORATE																						
Perchlorate	µg/L	17	< 0.05	U	< 0.05	U	< 0.05	U	< 2.5	U	< 0.2	U	0.17	J	< 2	U	< 2	U	< 2	U	0.0428	J
VOLATILES																						
1,1,2-Trichloroethane	µg/L	NV	< 5	U	< 1	U	< 10	U	< 5	U	< 5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U
1,1-Dichloroethene	µg/L	7	20		12		11		14		10		5.1		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichloroethane	µg/L	5	< 5	U	< 0.5	U	< 5	U	< 2.5	U	< 2.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70	1,100		210		600		1,000		870		380		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Methylene chloride	µg/L	NV	< 10	U	< 2	U	16	UB	< 5	U	< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
Trichloroethene	µg/L	5	3,800		2,300		2,100		2,000		1,200		1,200		< 0.5	U	< 0.5	U	0.61	J	< 0.5	U
Vinyl chloride	µg/L	2	100		94		39		37		48		30		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-9
Year 1 and Year 2 RA-O Analytical Results, Outside Treatment Areas, LHAAP-16

			Location Code	16WW43											16WW44							
			Sample ID	16WW43-201022		16WW43-210128		16WW43-210422		16WW43-210728		16WW43-211018		16WW43-220125		16WW44-181010		16WW44-200317		16WW44-200720		16WW44-201019	
			Sample Date	10/22/2020		1/28/2021		4/22/2021		7/28/2021		10/18/2021		1/25/2022		10/10/2018		3/17/2020		7/20/2020		10/19/2020	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description	Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																							
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																							
	Dissolved oxygen	mg/L	NV	0.04		3.24		0.38		0.56		0.39		0.76		1.8		0.03		0.2		0.08	
	Oxidation Reduction Potential	mV	NV	15		-6.8		136		5		34		127		53.5		4		107		22	
	pH	STD UNIT	NV	5.92		6.3		5.2		6.01		5.47		5.46		5.99		6.42		5.55		6.05	
	Specific conductivity	mS/cm	NV	0.357		0.442		0.408		0.437		0.558		0.806		0.381		0.224		0.163		0.201	
	Temperature	C	NV	20.52		14.40		14.19		24.05		23.75		16.67		20.51		18.41		22.06		21.09	
	Total Purge	L	NV	3.0		7		3		3.00		NA		NA		7.125		3.0		3		3.0	
	Turbidity	NTU	NV	1.2		7.5		4.8		20.2		1.7		22.3		139.3		19.7		41.5		0.7	
	Water Level at Reading Time	Ft BTOC	NV	7.92		4.8		4.95		5.91		NA		NA		26.76		23.32		22.89		23.6	
GASES																							
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																							
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																							
	Perchlorate	µg/L	17	< 0.05	U	0.0777	J	< 0.25	U	< 0.05	U	< 0.2	U	< 0.2	U	< 2	U	< 2	U	< 0.05	U	< 0.05	U
VOLATILES																							
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Methylene chloride	µg/L	NV	< 1	U	< 2	U	< 2	U	< 1	U	< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
	Trichloroethene	µg/L	5	0.94	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-9
Year 1 and Year 2 RA-O Analytical Results, Outside Treatment Areas, LHAAP-16

			Location Code	16WW44										16WW46									
			Sample ID	16WW44-210122		16WW44-210412		16WW44-210712		16WW44-211025		16WW44-220110		16WW46-181012		16WW46-200312		16WW46-200727-FD		16WW46-200727		16WW46-201019	
			Sample Date	1/22/2021		4/12/2021		7/12/2021		10/25/2021		1/10/2022		10/12/2018		3/12/2020		7/27/2020		7/27/2020		10/19/2020	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		FD		REG		REG	
			Location Description	Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																							
	Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
FIELD TESTS																							
	Dissolved oxygen	mg/L	NV	0.67		0.3		0.95		0.31		0.8		0.49		0.61		0.02		0.02		0.16	
	Oxidation Reduction Potential	mV	NV	-45.1		157		195		156		267		43.9		70		3		3		85	
	pH	STD UNIT	NV	6.46		5.79		5.13		5.28		3.98		6.24		6.88		6.42		6.42		5.89	
	Specific conductivity	mS/cm	NV	0.400		0.176		0.123		0.152		0.216		2.912		2.90		3.95		3.95		3.88	
	Temperature	C	NV	17.59		16.65		20.59		20.33		15.22		18.84		21.73		21.53		21.53		21.34	
	Total Purge	L	NV	7.0		3		1		NA		NA		5.2		3.0		3.0		3.0		3.0	
	Turbidity	NTU	NV	0		52.2		61		8.2		18.2		18.2		19.6		13.2		13.2		0	
	Water Level at Reading Time	Ft BTOC	NV	22.6		22.36		22.13		NA		NA		16.09		12.67		13.24		13.24		13.82	
GASES																							
	Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
GEN CHEMISTRY																							
	Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Bromide	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrate	mg/L	10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
PERCHLORATE																							
	Perchlorate	µg/L	17	< 0.05	UJ	0.134		1.35		< 0.2	U	3.2		< 2	U	< 2	U	3.31		4.07		< 0.05	U
VOLATILES																							
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Methylene chloride	µg/L	NV	< 2	U	< 2	U	< 1	U	< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
	Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	0.5	J	3		2.7		0.66	J	0.57	J	0.66	J
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-9
Year 1 and Year 2 RA-O Analytical Results, Outside Treatment Areas, LHAAP-16

	Location Code		16WW46										16WW57								
	Sample ID		16WW46-210119		16WW46-210412		16WW46-210727		16WW46-211018		16WW46-220111		16WW57-190918		16WW57-200817		16WW57-200817		16WW57-201008		16WW57-210127	
	Sample Date		1/19/2021		4/12/2021		7/27/2021		10/18/2021		1/11/2022		9/18/2019		March 2020		8/17/2020		10/8/2020		1/27/2021	
	Sample Purpose		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
	Location Description		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Shallow Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone	
Parameter	Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																						
Dehalococcoides	cells/mL	NV	NA		NA		NA		NA		NA		35.3		NS		1.3		2.6		4.3	
FIELD TESTS																						
Dissolved oxygen	mg/L	NV	0.74		0.85		0.73		0.48		0.52		0.17		NS		0.04		0.04		0.44	
Oxidation Reduction Potential	mV	NV	-12		127		-61		94		128		13.6		NS		45		2		14.9	
pH	STD UNIT	NV	6.52		6.70		6.95		5.7		6.38		5.69		NS		5.79		5.85		6.02	
Specific conductivity	mS/cm	NV	3.22		3.67		4.33		3.07		2.59		3.577		NS		6.18		6.33		6.731	
Temperature	C	NV	15.22		21.35		21.43		18.5		16.73		20.79		NS		21.25		19.24		15.42	
Total Purge	L	NV	6.6		3		2.50		NA		NA		N		NS		3.5		3		7.0	
Turbidity	NTU	NV	18.9		15.3		14.3		4.1		81.3		0.4		NS		165		191		5.8	
Water Level at Reading Time	Ft BTOC	NV	12.7		12.46		12.42		NA		NA		6.15		NS		5.2		5.57		3.84	
GASES																						
Ethane	µg/L	NV	NA		NA		NA		NA		NA		0.246	J	NS		< 0.25	U	< 0.25	U	< 0.47	U
Ethylene	µg/L	NV	NA		NA		NA		NA		NA		1.18		NS		< 0.5	U	1.25		< 0.55	U
Methane	µg/L	NV	NA		NA		NA		NA		NA		2.44		NS		2.19	J-	2.99		0.86	J
GEN CHEMISTRY																						
Alkalinity	mg/L	NV	NA		NA		NA		NA		NA		133		NS		138		77.6		131	
Bromide	mg/L	NV	NA		NA		NA		NA		NA		3.16		NS		4.7		5.69		4.96	
Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NS		NA		NA		NA	
Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NS		NA		NA		NA	
Nitrate	mg/L	10	NA		NA		NA		NA		NA		< 0.1	U	NS		< 0.5	U	< 1	U	< 0.5	U
Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NS		NA		NA		NA	
Sulfate	mg/L	NV	NA		NA		NA		NA		NA		2,310		NS		2,610		2,440		2,520	
Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		10.9		NS		13.2		13.1		12.6	
PERCHLORATE																						
Perchlorate	µg/L	17	< 0.05	U	< 0.5	U	< 1	U	< 0.2	U	0.098	J	< 2	U	NS		0.454	J	< 0.05	U	< 0.5	UJ
VOLATILES																						
1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 1	UJ	< 1	U	< 1	U	< 0.5	U	NS		< 1	U	< 1	U	< 1	U
1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	U	0.56	J	NS		1.5		1.3		0.94	J
1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	U	< 0.5	U	NS		< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	U	< 0.5	U	NS		< 0.5	U	< 0.5	U	< 0.5	U
Methylene chloride	µg/L	NV	< 2	U	< 2	U	< 1	UJ	< 1	U	< 2	U	< 1	U	NS		< 1	U	< 1	U	< 2	U
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	0.63	J	< 0.5	U	0.82	J	24		NS		69	J+	72		65	J
Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	U	< 0.5	U	NS		< 0.5	U	< 0.5	U	< 0.5	UJ

Table 2-9
Year 1 and Year 2 RA-O Analytical Results, Outside Treatment Areas, LHAAP-16

			Location Code	16WW57								16WW58											
			Sample ID	16WW57-210413		16WW57-210714		16WW57-211013		16WW57-220113		16WW58-190918		16WW58-190918-FD		16WW58		16WW58-200817		16WW58-201008		16WW58-210127	
			Sample Date	4/13/2021		7/14/2021		10/13/2021		1/13/2022		9/18/2019		9/18/2019		March 2020		8/17/2020		10/8/2020		1/27/2021	
			Sample Purpose	REG		REG		REG		REG		REG		FD		REG		REG		REG		REG	
			Location Description	Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																							
	Dehalococcoides	cells/mL	NV	3.1		4.7		6.7		9.9		17.8		NA		NS		1.1		10.3		28	
FIELD TESTS																							
	Dissolved oxygen	mg/L	NV	0.36		0.56		0.26		0.58		0.16		0.16		NS		NA		0.06		0.47	
	Oxidation Reduction Potential	mV	NV	54		55		-21		106		-78.1		-78.1		NS		NA		-73		-39.2	
	pH	STD UNIT	NV	5.83		5.3		5.54		5.74		5.98		5.98		NS		NA		6.23		6.21	
	Specific conductivity	mS/cm	NV	5.04		3.65		5.29		5.34		2.761		2.761		NS		NA		3.01		2.991	
	Temperature	C	NV	17		20.27		21.26		13.5		20.86		20.86		NS		NA		19.23		16.81	
	Total Purge	L	NV	3.0		1.50		NA		NA		NA		NA		NS		NA		3		6	
	Turbidity	NTU	NV	63		166		90.1		202		0.7		0.7		NS		NA		157		0	
	Water Level at Reading Time	Ft BTOC	NV	4.37		4.48		NA		NA		9.18		9.18		NS		NA		6.98		4.73	
GASES																							
	Ethane	µg/L	NV	< 0.5	U	< 0.25	U	< 0.5	U	< 0.5	U	0.332	J	0.318	J	NS		< 0.25	U	< 0.25	U	< 0.47	U
	Ethylene	µg/L	NV	< 0.5	UJ	1.08	J	1.95	J	1.45	J	1.51		1.43		NS		1.71		0.645	J	0.44	J
	Methane	µg/L	NV	1.41	J	3.14		1.43		2.6	J	3.62		4.37		NS		9.69		6.59		7.7	
GEN CHEMISTRY																							
	Alkalinity	mg/L	NV	175		126		164		191		94		107		NS		97.8		41.9		85.6	
	Bromide	mg/L	NV	4.78		1.96		< 0.5	U	< 0.5	UJ	3.52		3.48		NS		3.42		4.33		3.7	
	Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NS		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA		NA		NA		NS		NA		NA		NA	
	Nitrate	mg/L	10	< 0.5	U	< 0.2	U	< 0.5	U	0.215	J	< 0.1	U	< 0.1	U	NS		< 0.1	U	< 0.5	U	0.234	
	Nitrite	mg/L	1	NA		NA		NA		NA		NA		NA		NS		NA		NA		NA	
	Sulfate	mg/L	NV	2,360		1,660		2,250		2,650	J	394		396		NS		348		383		367	
	Total organic carbon	mg/L	NV	16.8		17.1		19		19.8		4.21		4.27		NS		4.56		4.13		3.53	
PERCHLORATE																							
	Perchlorate	µg/L	17	0.171	J	< 0.5	U	< 0.2	UJ	0.099	J	< 2	U	< 2	U	NS		< 0.5	U	< 0.05	U	< 0.25	U
VOLATILES																							
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 1	U	< 1	U	< 2.5	U	< 2.5	U	NS		< 5	U	< 2.5	U	< 5	U
	1,1-Dichloroethene	µg/L	7	1		1.1		1.2		1.1		3.9	J	3.9	J	NS		2.9	J	3.3	J	< 2.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 2.5	U	< 2.5	U	NS		< 2.5	U	< 2.5	U	< 2.5	U
	cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	0.8	J	< 0.5	U	0.66	J	170		180		NS		110		140		94	
	Methylene chloride	µg/L	NV	< 2	U	< 1	U	< 1	U	< 2	U	< 5	U	< 5	U	NS		< 5	U	5.7	J	< 10	U
	Trichloroethene	µg/L	5	57		60		75		85		4,300		4,100		NS		3,400		4,400		2,700	
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 2.5	U	< 2.5	U	NS		< 2.5	U	< 2.5	U	< 2.5	U

Table 2-9
Year 1 and Year 2 RA-O Analytical Results, Outside Treatment Areas, LHAAP-16

		Location Code	16WW58							
		Sample ID	16WW58-210413		16WW58-210714		16WW58-211013		16WW58-220113	
		Sample Date	4/13/2021		7/14/2021		10/13/2021		1/13/2022	
		Sample Purpose	REG		REG		REG		REG	
		Location Description	Intermediate Zone		Intermediate Zone		Intermediate Zone		Intermediate Zone	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC											
	Dehalococcoides	cells/mL	NV	13		6.9		8.05		21.6	
FIELD TESTS											
	Dissolved oxygen	mg/L	NV	0.05		0.64		0.34		0.77	
	Oxidation Reduction Potential	mV	NV	10		18		-53		118	
	pH	STD UNIT	NV	5.53		5.26		5.11		5.91	
	Specific conductivity	mS/cm	NV	2.49		1.83		2.5		3.21	
	Temperature	C	NV	16.9		19.37		22.44		14.86	
	Total Purge	L	NV	3		3.00		NA		NA	
	Turbidity	NTU	NV	247		58.3		49.2		166	
	Water Level at Reading Time	Ft BTOC	NV	5.84		6.32		NA		NA	
GASES											
	Ethane	µg/L	NV	< 0.5	U	< 0.25	U	< 0.5	U	< 0.5	U
	Ethylene	µg/L	NV	< 0.5	UJ	2.15	J	3.14	J	3.72	J
	Methane	µg/L	NV	6.29	J	8.35		1.67		4.57	
GEN CHEMISTRY											
	Alkalinity	mg/L	NV	98.4		99.2		162		144	
	Bromide	mg/L	NV	2.5		2.3		< 0.1	U	2.24	
	Chloride	mg/L	NV	NA		NA		NA		NA	
	Fluoride	mg/L	NV	NA		NA		NA		NA	
	Nitrate	mg/L	10	< 0.1	U	< 0.1	U	< 0.1	U	0.0416	J
	Nitrite	mg/L	1	NA		NA		NA		NA	
	Sulfate	mg/L	NV	282		162		194		594	
	Total organic carbon	mg/L	NV	3.43		4.68		5.5		9.26	
PERCHLORATE											
	Perchlorate	µg/L	17	0.0348	J	< 1	U	< 0.2	UJ	< 0.2	U
VOLATILES											
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 5	U	< 5	U	< 10	U
	1,1-Dichloroethene	µg/L	7	1.1		< 2.5	U	< 2.5	U	< 5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 2.5	U	< 2.5	U	< 5	U
	cis-1,2-Dichloroethene	µg/L	70	49		52		120		170	
	Methylene chloride	µg/L	NV	< 2	U	< 5	U	< 5	U	< 20	U
	Trichloroethene	µg/L	5	1,100		1,000		3,300		5,500	
	Vinyl chloride	µg/L	2	< 0.5	U	< 2.5	U	< 2.5	U	< 5	U

Table 2-9
Year 1 and Year 2 RA-O Analytical Results, Outside Treatment Areas, LHAAP-16

Notes:

COC concentrations highlighted in blue exceed the PCL/MCL.

µg/L - micrograms per liter

µS/cm - microsiemens per centimeter

J - The analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.

U - Not detected. The analyte was analyzed for, but not detected above the associated reporting limit.

cells/mL - cells per milliliter

deg. C - degrees Celsius

FD - field duplicate

Ft BTOC - feet below top of casing

Gal - gallons

ID - identifier

L - liters

MCL - maximum contaminant level

mg/L - milligrams per liter

mL/Min - milliliters per minute

mV - millivolts

NA - not analyzed

NS - not sampled

NTU - nephelometric turbidity unit

NV - no value

PCL - protective concentration level

RA-O - remedial action operation

Reg - regular sample

STD UNIT - standard unit

UTL - upper tolerance limit

Val Qual - validation qualifier

Table 2-10
Approved LHAAP-16 Monitoring Network for Year 3

Sampling Location	Sampling Purpose	Perchlorate (EPA 6850)	VOCs [a] (SW8260B)	DO (field reading)	ORP (field reading)	pH (field reading)	Anions [b] (E300.0)	Ethene (RSK-175)	Ethane (RSK-175)	Methane (RSK-175)	Carbon Dioxide (RSK-175) [c]	TOC (SW9060)	DHC (qPCR)
Landfill Biobarrier #1 (RAWP Table 4-4)													
16IW09	Performance data within the biobarrier	X	X	X	X	X	X	X	X	X	X	X	X
16RW01	Upgradient well for monitoring influent concentrations	X	X	X	X	X							
16RW04	Downgradient well to monitor effluent concentrations and biobarrier effectiveness	X	X	X	X	X		X	X	X			
16RW05	Downgradient well to monitor effluent concentrations and biobarrier effectiveness	X	X	X	X	X		X	X	X			
16WW26	Downgradient well to monitor effluent concentrations and biobarrier effectiveness	X	X	X	X	X						X	
16WW42	Downgradient well to monitor effluent concentrations and biobarrier effectiveness	X	X	X	X	X							
Landfill Biobarrier #2 (RAWP Table 4-5)													
16IW03	Performance data within the biobarrier	X	X	X	X	X	X	X	X	X	X	X	X
16PM02	Upgradient well for monitoring influent concentrations	X	X	X	X	X							
16PM03	Upgradient well for monitoring influent concentrations	X	X	X	X	X							
16PM06	Downgradient well to monitor effluent concentrations and biobarrier effectiveness	X	X	X	X	X		X	X	X			
16PM09	Downgradient well to monitor effluent concentrations and biobarrier effectiveness	X	X	X	X	X							

Table 2-10
Approved LHAAP-16 Monitoring Network for Year 3

Sampling Location	Sampling Purpose	Perchlorate (EPA 6850)	VOCs [a] (SW8260B)	DO (field reading)	ORP (field reading)	pH (field reading)	Anions [b] (E300.0)	Ethene (RSK-175)	Ethane (RSK-175)	Methane (RSK-175)	Carbon Dioxide (RSK-175) [c]	TOC (SW9060)	DHC (qPCR)
16PM14	Downgradient well to monitor effluent concentrations and biobarrier effectiveness	X	X	X	X	X							
16WW36	Downgradient well to monitor effluent concentrations and biobarrier effectiveness	X	X	X	X	X						X	
Landfill Biobarrier #3 (RAWP Table 4-6)													
16IW10	Performance data within the biobarrier	X	X	X	X	X	X	X	X	X	X	X	X
16RW06	Upgradient well for monitoring influent concentrations	X	X	X	X	X							
16RW07	Upgradient well for monitoring influent concentrations	X	X	X	X	X							
16RW09	Downgradient well to monitor effluent concentrations and biobarrier effectiveness	X	X	X	X	X		X	X	X		X	
16RW10	Downgradient well to monitor effluent concentrations and biobarrier effectiveness	X	X	X	X	X		X	X	X			
Bayou Biobarrier (RAWP Table 4-7)													
16IW20	Performance data within the biobarrier	X	X	X	X	X	X	X	X	X	X	X	X
16RW12	Performance data downgradient the biobarrier	X	X	X	X	X							
16WW12	Upgradient well to monitor effluent concentrations and biobarrier effectiveness	X	X	X	X	X							
16WW22	Upgradient well to monitor effluent concentrations and biobarrier effectiveness	X	X	X	X	X							
16WW39	Upgradient well for monitoring influent concentrations	X	X	X	X	X							

Table 2-10
Approved LHAAP-16 Monitoring Network for Year 3

Sampling Location	Sampling Purpose	Perchlorate (EPA 6850)	VOCs [a] (SW8260B)	DO (field reading)	ORP (field reading)	pH (field reading)	Anions [b] (E300.0)	Ethene (RSK-175)	Ethane (RSK-175)	Methane (RSK-175)	Carbon Dioxide (RSK-175) [c]	TOC (SW9060)	DHC (qPCR)
16WW40	Downgradient well to monitor effluent concentrations and biobarrier effectiveness	X	X	X	X	X		X	X	X		X	
Mid-Plume ISB (RAWP Table 4-8)													
16EW01	Performance data for injection ISB area - Shallow Zone	X	X	X	X	X						X	
16EW02	Performance data for injection ISB area - Shallow Zone	X	X	X	X	X	X	X	X	X	X	X	X
16EW03	Performance data for injection ISB area - Shallow Zone	X	X	X	X	X	X	X	X	X	X	X	
16EW04	Performance data for injection ISB area - Shallow Zone	X	X	X	X	X							
16EW08	Performance data for injection well - Intermediate Zone	X	X	X	X	X							
16IW26	Performance data for injection well - Intermediate Zone	X	X	X	X	X	X	X	X	X	X	X	X
Proposed Intermediate well between 16EW06 and 16EW07	Performance data for injection - Intermediate Zone	X	X	X	X	X	X	X	X	X	X	X	X
16WW29	Performance data for downgradient well - Intermediate Zone	X	X	X	X	X							
16WW30	Performance data for downgradient - Shallow Zone	X	X	X	X	X							
16WW39	Performance data for downgradient - Shallow Zone	X	X	X	X	X							
16WW48	Performance data for downgradient - Shallow Zone (proposed)	X	X	X	X	X	X	X	X	X	X		
16WW49	Performance data for downgradient well - Intermediate Zone (proposed)	X	X	X	X	X							

Table 2-10
Approved LHAAP-16 Monitoring Network for Year 3

Sampling Location	Sampling Purpose	Perchlorate (EPA 6850)	VOCs [a] (SW8260B)	DO (field reading)	ORP (field reading)	pH (field reading)	Anions [b] (E300.0)	Ethene (RSK-175)	Ethane (RSK-175)	Methane (RSK-175)	Carbon Dioxide (RSK-175) [c]	TOC (SW9060)	DHC (qPCR)
16WW51	Performance data for downgradient well - Intermediate Zone (proposed)	X	X	X	X	X							
MNA and LTM "Other Wells" (RAWP Table 4-9)													
16WW13	Intermediate	X	X	X	X	X							
16WW16	Shallow	X	X	X	X	X	X	X	X	X	X	X	
16WW23	Intermediate	X	X	X	X	X							
16WW24	Shallow	X	X	X	X	X							
16WW25	Intermediate	X	X	X	X	X							
16WW27	Intermediate	X	X	X	X	X							
16WW31	Intermediate	X	X	X	X	X							
16WW32	Shallow	X	X	X	X	X							
16WW33	Intermediate	X	X	X	X	X							
16WW34	Shallow	X	X	X	X	X							
16WW35	Intermediate	X	X	X	X	X	X	X	X	X	X	X	
16WW37	Intermediate	X	X	X	X	X							
16WW38	Shallow	X	X	X	X	X							
16WW41	Intermediate	X	X	X	X	X	X	X	X	X	X	X	
16WW43	Shallow	X	X	X	X	X							
16WW44	Shallow	X	X	X	X	X							
16WW46	Shallow	X	X	X	X	X							
16WW55	Shallow	X	X	X	X	X	X	X	X	X	X	X	
16WW56	Shallow	X	X	X	X	X							
16WW57	Shallow	X	X	X	X	X	X	X	X	X	X	X	
16WW58	Shallow	X	X	X	X	X	X	X	X	X	X	X	

Table 2-10
Approved RA-O Monitoring Network for Year 3, LHAAP-16

Notes:

[a] VOCs include TCE; cis-1,2-DCE; 1,1-DCE; 1,2-DCA; 1,1,2-TCA; VC; and methylene chloride.

[b] Anions include nitrate and sulfate.

[c] As discussed in the *Final Technical Memorandum - MNA Monitoring Parameters* (Bhate 2019), alkalinity is a proxy for carbon dioxide. Switching the two parameters allows removal of one laboratory method, since carbon dioxide can be analyzed using RSK-175.

X - Parameter/measurement will be analyzed/collected at this location.

Bhate - Bhate Environmental Associates, Inc.

DCA - dichloroethane

DCE - dichloroethene

DHC - Dehalococcoides

DO - dissolved oxygen

EPA - U.S. Environmental Protection Agency

ISB - in situ bioremediation

MNA - monitored natural attenuation

ORP - oxygen reduction potential

qPCR - quantitative polymerase chain reaction

RAWP - Remedial Action Work Plan

TCA - trichloroethane

TCE - trichloroethene

TOC - total organic carbon

VC - vinyl chloride

VOCs - volatile organic compounds

Table 2-11
Five Year Review Monitoring for Metals, LHAAP-16

Cleanup Levels	Arsenic	Chromium	Manganese [a]	Nickel	Thallium [b]
	10	100	1100/7820	490	2
Shallow Wells					
16WW12		X			X
16WW14		X			X
16WW16			X		X
16WW22				X	X
16WW24		X	X		X
16WW26			X		X
16WW30			X		X
16WW32					X
16WW34		X		X	X
16WW36			X		X
16WW38		X			X
16WW39	X	X	X	X	X
16WW40	X	X	X	X	X
16WW42	X	X	X	X	X
16WW43	X	X	X	X	X
16WW44	X	X	X	X	X
16WW46	X	X	X	X	X
Intermediate Wells					
16WW06					X
16WW13			X		X
16WW23			X		X
16WW25	X		X		X
16WW27			X		X
16WW28			X		X
16WW29			X		X
16WW31		X			X
16WW33			X		X
16WW35	X		X		X
16WW37			X		X
16WW41	X	X	X	X	X
Upper Deep Wells					
16WW19					X
16WW20					X
16WW21					X
Lower Deep Wells					
16WW15					X
16WW17					X
16WW18					X

Notes:

[a] TCEQ Protective Concentration Limit of 1,100 µg/L and background of 7,820 µg/L.

[b] Historically, thallium was not detected; however, the detection limits were above the cleanup level.

µg/L - micrograms per liter

Table 2-12
Year 1 and Year 2 RA-O Analytical Results, Surface Water, LHAAP-16

			Location Code	16SW01																	
			Sample ID	16SW01-200331		16SW01-200728		16SW01-201026		16SW01-210127		16SW01-210419-FD		16SW01-210419		16SW01-210726		16SW01-210726-FD		16SW01-220126	
			Sample Date	3/31/2020		7/28/2020		10/26/2020		1/27/2021		4/19/2021		4/19/2021		7/26/2021		7/26/2021		1/26/2022	
			Sample Purpose	REG		REG		REG		REG		FD		REG		REG		FD		REG	
			Location Description																		
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	NM		NM		NM		8.54		0.98		0.98		0.6		0.6		0.77	
	Oxidation Reduction Potential	mV	NV	NM		NM		NM		19.9		77		77		121		121		133	
	pH	pH_units	NV	NM		NM		NM		6.67		7.71		7.71		6.39		6.39		6.54	
	Specific conductivity	mS/cm	NV	NM		NM		NM		0.478		0.163		0.163		0.459		0.459		0.779	
	Temperature	deg. C	NV	NM		NM		NM		11.86		14.79		14.79		22.08		22.08		16.72	
	Turbidity	NTU	NV	NM		NM		NM		23.1		23.9		23.9		139		139		107	
METALS																					
	Arsenic	mg/L	NV	0.00106	J	0.00195	J	0.00145	J	0.00101	J	NA		0.000933	J	0.0014	J	0.00142	J	0.000423	J
	Chromium	mg/L	NV	0.00185	J	0.00189	J	0.000543	J	0.00196	J	NA		0.00235	J	0.00106	J	0.000898	J	< 0.001	U
	Manganese	mg/L	7.8	0.123		1.05		1.21		0.0488	J	NA		0.107		0.313		0.335		0.0468	J
	Nickel	mg/L	NV	0.00397	J	0.00364	J	0.00353	J	0.00384	J	NA		0.00412	J	0.00236	J	0.00242	J	0.000987	J
	Thallium	mg/L	NV	< 0.0005	U	< 0.0005	U	0.000711	J	0.000668	J	NA		0.00117	J	< 0.0005	U	< 0.0005	U	< 0.0005	U
PERCHLORATE																					
	Perchlorate	µg/L	17	< 2	U	< 0.05	U	< 0.05	U	< 0.05	U	NA		< 0.25	U	< 0.05	U	< 0.05	U	0.18	J
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 0.5	U	< 1	U	NA		< 1	U	< 1	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Methylene chloride	µg/L	NV	< 1	U	< 1	U	< 1	U	< 2	U	NA		< 2	U	< 1	U	< 1	U	< 2	U
	Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-12
Year 1 and Year 2 RA-O Analytical Results, Surface Water, LHAAP-16

			Location Code	16SW01		16SW02												16SW03	
			Sample ID	16SW01-220126-FD		16SW02-200331		16SW02-200728		16SW02-201026		16SW02-210127		16SW02-210419		16SW02-210726		16SW02-220126		16SW03-200331	
			Sample Date	1/26/2022		3/31/2020		7/28/2020		10/26/2020		1/27/2021		4/19/2021		7/26/2021		1/26/2022		3/31/2020	
			Sample Purpose	FD		REG		REG		REG		REG		REG		REG		REG		REG	
			Location Description																		
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
FIELD TESTS																					
	Dissolved oxygen	mg/L	NV	0.77		NM		NM		NM		8.6		0.92		0.71		0.65		NM	
	Oxidation Reduction Potential	mV	NV	133		NM		NM		NM		63.7		63		145		150		NM	
	pH	pH_units	NV	6.54		NM		NM		NM		6.82		7.55		6.57		6.71		NM	
	Specific conductivity	mS/cm	NV	0.779		NM		NM		NM		0.268		0.201		0.38		0.597		NM	
	Temperature	deg. C	NV	16.72		NM		NM		NM		12.22		15.21		21.88		16.38		NM	
	Turbidity	NTU	NV	107		NM		NM		NM		18.9		27.3		145		121		NM	
METALS																					
	Arsenic	mg/L	NV	0.000488	J	0.00102	J	0.00209	J	0.00225	J	0.000934	J	0.00101	J	0.0018	J	0.000497	J	0.0012	J
	Chromium	mg/L	NV	0.0005	J	0.00138	J	0.00196	J	0.00114	J	0.00175	J	0.00336	J	0.00196	J	< 0.001	U	0.00206	J
	Manganese	mg/L	7.8	0.0322	J	0.114		1.42		3.53		0.045		0.119		0.742		0.0316		0.136	
	Nickel	mg/L	NV	0.00139	J	0.00349	J	0.00398	J	0.00691		0.00338	J	0.00452	J	0.00373	J	0.00113	J	0.00436	J
	Thallium	mg/L	NV	< 0.0005	U	< 0.0005	U	< 0.0005	U	< 0.0005	U	< 0.0005	U	< 0.0005	U	< 0.0005	U	< 0.0005	U	< 0.0005	U
PERCHLORATE																					
	Perchlorate	µg/L	17	0.18	J	< 2	U	< 0.05	U	< 0.05	U	< 0.05	U	< 0.25	U	< 0.05	U	0.17	J	< 2	U
VOLATILES																					
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Methylene chloride	µg/L	NV	< 2	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 1	U	< 2	U	< 1	U
	Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-12
Year 1 and Year 2 RA-O Analytical Results, Surface Water, LHAAP-16

			Location Code	16SW03											
			Sample ID	16SW03-200728		16SW03-201026		16SW03-210127		16SW03-210419		16SW03-210726		16SW03-220126	
			Sample Date	7/28/2020		10/26/2020		1/27/2021		4/19/2021		7/26/2021		1/26/2022	
			Sample Purpose	REG		REG		REG		REG		REG		REG	
			Location Description												
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
FIELD TESTS															
	Dissolved oxygen	mg/L	NV	NM		NM		8.88		0.88		0.67		0.81	
	Oxidation Reduction Potential	mV	NV	NM		NM		16.5		72		155		159	
	pH	pH_units	NV	NM		NM		7.41		7.45		6.49		6.62	
	Specific conductivity	mS/cm	NV	NM		NM		0.452		0.221		0.40		0.818	
	Temperature	deg. C	NV	NM		NM		13.44		15.43		21.71		16.55	
	Turbidity	NTU	NV	NM		NM		20.5		25.1		141		162	
METALS															
	Arsenic	mg/L	NV	0.0018	J	0.00097	J	0.000854	J	0.00104	J	0.00149	J	0.000567	J
	Chromium	mg/L	NV	0.00212	J	< 0.001	U	0.00203	J	0.00277	J	0.00243	J	< 0.001	U
	Manganese	mg/L	7.8	0.687	J	0.204		0.122		0.106		0.38		0.0296	
	Nickel	mg/L	NV	0.0032	J	0.00205	J	0.00361	J	0.00451	J	0.00309	J	0.000992	J
	Thallium	mg/L	NV	< 0.0005	U	< 0.0005	U	< 0.0005	U	< 0.0005	U	< 0.0005	U	< 0.0005	U
PERCHLORATE															
	Perchlorate	µg/L	17	< 0.05	U	< 0.05	U	< 0.05	U	< 0.25	U	< 0.05	U	0.18	J
VOLATILES															
	1,1,2-Trichloroethane	µg/L	NV	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
	1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Methylene chloride	µg/L	NV	< 1	U	< 1	U	< 2	U	< 2	U	< 1	U	< 2	U
	Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-12
Year 1 and Year 2 RA-O Analytical Results, Surface Water, LHAAP-16

Notes:

No flow in October 2021; therefore no surface water samples were collected.

µg/L - micrograms per liter

J - The analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.

U - Not detected. The analyte was analyzed for, but not detected above the associated reporting limit.

deg. C - degrees Celsius

FD - field duplicate

ID - identifier

MCL - maximum contaminant level

mg/L - milligrams per liter

mL/Min - milliliters per minute

mS/cm - millisiemens per centimeter

mV - millivolts

NA - not analyzed

NM - not measured

NTU - nephelometric turbidity unit

NV - no value

PCL - protective concentration level

RA-O - remedial action operation

Reg - regular sample

UTL - upper tolerance limit

Val Qual - validation qualifier

Table 3-1
Historical Data

Well ID	Parameter / Date	Perchlorate µg/L Result	Trichloroethene µg/L Result
16EW01	02/10/2010	770	68.1
	02/16/2011	729	36.4
	12/04/2012	1050	380 J
	02/05/2014	245	8470
	02/19/2015	217	
	02/19/2015	217	12800
	02/25/2016	206	7250
	02/07/2018	130	3600
	02/26/2019	51 J	3700
	03/09/2020	28	3700
	07/16/2020	28.4	4700
	10/20/2020	27.5	5400
	01/25/2021	180 J	4100
	04/21/2021	41.9	3500
	07/13/2021	29	990
	10/20/2021	40.3	970
	01/13/2022	61	1800
16EW02	02/10/2010	38	102000
	02/16/2011	29.3	68000
	12/04/2012	151	33400
	02/05/2014	2.28	34900
	02/19/2015	0.482	57800
	02/25/2016	2.64	47100
	02/07/2018	5	19000
	10/09/2018	< 2 U	24000
	02/26/2019	< 2 U	34000
	09/18/2019	< 2 U	42000
	03/09/2020	25	17000
	07/16/2020	16.2	37000
	10/21/2020	< 0.05 U	26000
	01/26/2021	< 0.5 U	38000
	04/19/2021	0.53	23000
	07/26/2021	0.984 J	25000
	10/20/2021	2.53	23000
	01/12/2022	1.6	19000
16EW03	02/10/2010	< 3	44900
	02/16/2011	6.54	30500
	12/04/2012	0.139 J	31400
	02/05/2014	1.83	5800
	02/19/2015	0.554	3190
	02/25/2016	< 0.2 U	29600
	02/07/2018	< 4 U	24000
	02/26/2019	< 2 U	7400
	03/25/2020	< 10 U	170

Table 3-1
Historical Data

Well ID	Parameter / Date	Perchlorate µg/L Result	Trichloroethene µg/L Result
16EW03 (cont.)	07/28/2020	2.09	60
	10/22/2020	< 0.1 U	130
	02/02/2021	< 0.5 UJ	290
	04/21/2021	< 0.05 U	250
	07/22/2021	< 0.5 U	77
	10/20/2021	< 0.2 U	54
	01/27/2022	< 0.2 U	84
16EW04	02/10/2010	< 1.5	758
	02/16/2011	0.518	11000
	12/04/2012	0.165 J	53500
	02/05/2014	12.7	31000
	02/19/2015	2.97	24400
	02/25/2016	0.229 J	40200
	02/07/2018	< 4 U	67
	02/26/2019	< 2 U	900
	03/09/2020	< 2 U	3400
	07/28/2020	1.42	15000
	10/20/2020	< 0.05 U	520 J-
	02/02/2021	< 0.5 UJ	17000
	04/19/2021	< 0.05 U	9500
	07/26/2021	< 0.5 U	3100
	10/20/2021	< 0.2 U	5100
	01/12/2022	< 0.2 U	3400
16EW05	02/10/2010	4.4	15.1
	02/16/2011	252	501
	12/04/2012	529	7130
	02/05/2014	334	7410
	02/19/2015	67	570
	02/25/2016	410	4010
	02/07/2018	130	100 J
	02/26/2019	230	1700
	03/30/2020	< 20 U	< 50 UJ
	07/16/2020	0.16 J	< 100 U
	10/21/2021	0.164 J	< 5000 UJ
	01/27/2022	0.16 J	< 2500 U
16EW06	02/10/2010	30	2580
	02/16/2011	123	8330
	12/04/2012	76.4	6370
	02/05/2014	190	2710
	02/19/2015	75.5	6740
	02/25/2016	0.389 J	2360
	02/07/2018	< 4 U	660
	10/09/2018	< 2 U	5500
	02/26/2019	< 2 U	250

Table 3-1
Historical Data

Well ID	Parameter / Date	Perchlorate µg/L Result	Trichloroethene µg/L Result
16EW06 (cont.)	09/18/2019	42	6500
	03/25/2020	< 10 U	< 50 U
	07/16/2020	< 0.75 U	40 J
	10/21/2020	< 0.75 U	< 250 U
	02/02/2021	< 0.75 U	< 250 U
	04/22/2021	< 7.5 U	< 500 U
	07/27/2021		5000
	10/21/2021	< 0.2 UJ	3000 J
	01/27/2022	< 1 U	< 2400 U
16EW07	02/10/2010	< 3	184
	02/16/2011	1.85	356
	12/04/2012	< 0.2 U	304
	02/05/2014	< 0.2 U	573
	02/19/2015	< 0.2 U	859
	02/25/2016	< 0.2 U	386
	02/07/2018	< 4 U	130
	02/26/2019	< 2 U	81
	03/25/2020	< 10 U	100
	07/28/2020	4.68 J	5000 J-
	10/22/2020	< 0.75 U	490 J
	02/02/2021	< 0.75 U	< 250 U
	04/15/2021	0.375 J	< 500 U
	07/27/2021	< 0.75 U	< 500 UJ
	10/21/2021	0.22 J	< 5000 UJ
	01/25/2022	< 2 U	< 5000 U
16EW08	02/10/2010	< 1.2	39.8
	02/16/2011	0.116	196
	12/04/2012	< 0.2 U	122
	02/05/2014	0.823	53.9
	02/19/2015	< 0.2 U	59.9
	02/25/2016	< 0.2 U	35.8
	02/07/2018	< 4 U	460
	02/26/2019	< 2 U	170
	03/31/2020	< 20 U	52 J
	07/28/2020	0.0836 J	< 25 U
	10/20/2020	< 0.05 U	1.6
	02/02/2021	< 0.05 UJ	3.1
	04/19/2021	< 0.05 U	2.6
	07/26/2021	< 0.05 U	1.8
	10/20/2021	< 0.2 U	3.3 J
	01/12/2022	< 0.2 U	3.4
16IW03	03/25/2020	< 2 U	8000
	07/28/2020	1.85	13000
	10/13/2020	0.0876 J	10000

Table 3-1
Historical Data

Well ID	Parameter Date	Perchlorate µg/L Result	Trichloroethene µg/L Result
16IW03 (cont.)	01/26/2021	< 0.5 U	8800
	04/20/2021	0.754 J	8900
	07/22/2021	< 0.5 U	8100
	10/21/2021	< 0.2 U	9000 J
	01/27/2022	< 1 U	5600
16IW09	03/25/2020	< 2 UJ	< 5 UJ
	07/16/2020	0.184 J	< 25 U
	10/13/2020	0.0381 J	5.8
	01/26/2021	< 0.25 U	1
	04/22/2021	< 0.05 U	0.62 J
	07/14/2021	< 1 U	3.8
	10/20/2021	< 0.2 U	0.99 J
	01/25/2022	0.16 J	< 0.5 U
16IW10	03/25/2020	< 2 U	200
	07/14/2020	< 0.5 U	190
	10/13/2020	< 0.1 U	46
	01/26/2021	< 0.5 U	31
	04/21/2021	< 0.1 U	5.4
	07/22/2021	< 0.1 U	13
	10/20/2021	< 0.2 U	< 5 U
	01/25/2022	0.13 J	0.91 J
16IW20	03/09/2020	< 2 U	850
	07/21/2020	0.562 J	280
	10/21/2020	< 0.05 U	130
	01/27/2021	< 0.5 UJ	13
	04/21/2021	< 0.05 U	5.7
	07/22/2021	< 0.5 U	7.6
	10/21/2021	< 0.2 U	1.2 J
	01/25/2022	< 0.2 U	0.96 J
16PM02	03/17/2020	< 2 U	21000
	07/20/2020	0.0686 J	31000
	10/26/2020	< 0.05 U	65000
	01/22/2021	< 0.05 UJ	23000
	04/14/2021	0.0372 J	15000
	07/13/2021	< 2.5 U	17000
	10/25/2021	< 0.2 U	16000
	01/24/2022	< 0.2 U	31000
16PM03	03/17/2020	400	9700
	07/20/2020	245	9100
	10/26/2020	360	12000
	01/22/2021	330 J	9800
	04/14/2021	193	8800
	07/13/2021	118	8400
	10/25/2021	220	6300

Table 3-1
Historical Data

Well ID	Parameter Date	Perchlorate µg/L Result	Trichloroethene µg/L Result
16PM03	01/24/2022	278	6800
16PM06	03/10/2020	< 2 U	44000
	07/20/2020	< 0.5 U	58000
	10/26/2020	< 0.05 U	85000
	02/02/2021	< 0.5 UJ	49000 J
	04/13/2021	< 0.5 U	77000
	07/13/2021	0.0474 J	57000
	10/26/2021	< 0.2 U	19000
	01/24/2022	< 0.2 U	28000
16PM09	03/10/2020	< 2 U	680
	07/20/2020	< 0.05 U	1400
	10/26/2020	0.0253 J	2000
	01/22/2021	< 0.05 UJ	1300
	04/13/2021	0.0355 J	640
	07/22/2021	< 0.05 U	370
	10/26/2021	< 0.2 U	770
	01/24/2022	< 0.2 U	1300
16PM14	03/10/2020	< 2 U	4900
	07/20/2020	0.435 J	5100
	10/26/2020	< 0.1 U	5400
	02/02/2021	0.648 J	3800
	04/13/2021	0.259 J	4300
	07/22/2021	< 0.5 U	3700
	10/26/2021	< 0.2 U	2200
	01/24/2022	< 0.2 U	2300
16RW01	03/12/2020	< 2 U	3300
	07/27/2020	1.63	4200
	10/20/2020	< 0.05 U	4000
	01/22/2021	< 0.05 UJ	2900
	04/14/2021	0.0618 J	3000
	07/26/2021	< 0.5 U	2300
	10/26/2021	< 0.2 U	2200
	01/24/2022	0.053 J	1200
16RW02	03/12/2020	< 2 U	2.3
	07/21/2020	< 0.05 U	4.8
	10/22/2020	< 0.05 U	6.7
	01/22/2021	< 0.05 UJ	1.9
	04/14/2021	0.0612 J	3.1
	07/26/2021	0.0255 J	2.1
	10/13/2021	< 0.2 U	2.7
	01/24/2022	< 0.2 U	2.7
16RW04	03/09/2020	< 2 U	3000
	07/28/2020	2.08	3500
	10/21/2020	< 0.05 U	3400

Table 3-1
Historical Data

Well ID	Parameter Date	Perchlorate µg/L Result	Trichloroethene µg/L Result
16RW04 (cont.)	01/28/2021	0.328 J	2800
	04/14/2021	< 0.05 U	1100
	07/26/2021	< 0.5 U	1200
	10/20/2021	< 0.2 U	1600
	01/24/2022	< 0.2 U	970
16RW05	03/12/2020	< 2 U	3
	07/16/2020	1.77	< 5 U
	10/22/2020	< 0.05 U	0.89 J
	01/29/2021	< 0.5 U	< 0.5 U
	04/19/2021	< 0.1 U	0.52 J
	07/14/2021	< 2 U	1.1
	10/18/2021	< 0.2 U	< 0.5 U
	01/24/2022	< 0.2 U	0.81 J
16RW06	03/17/2020	< 2 U	86
	07/14/2020	< 0.5 U	77 J+
	10/26/2020	< 0.1 U	110
	01/22/2021	< 0.25 UJ	95
	04/19/2021	< 0.5 U	60
	07/27/2021	< 1 U	64 J
	10/25/2021	< 0.2 U	34
	01/25/2022	0.089 J	37
16RW07	03/17/2020	4.9	1900
	07/14/2020	2.45	2100
	10/26/2020	0.391	1100
	01/22/2021	0.638 J	2000
	04/19/2021	1	900
	07/27/2021	< 0.5 U	760 J
	10/25/2021	0.262 J	700
	01/25/2022	0.27	540
16RW09	03/11/2020	< 2 U	1300
	07/14/2020	0.491 J	1300
	10/26/2020	0.12 J	980
	02/02/2021	0.459 J	690
	04/20/2021	0.241	810
	07/14/2021	< 2 U	1.1
	07/27/2021	< 1 U	1400
	10/26/2021	< 0.2 U	610
	01/26/2022	< 0.2 U	730
16RW10	03/11/2020	150	4800
	07/20/2020	62.7	1800
	10/26/2020	8.11	2000
	02/02/2021	125 J	5300
	04/20/2021	36.5	2400
	07/27/2021	18.7	2000

Table 3-1
Historical Data

Well ID	Parameter / Date	Perchlorate µg/L Result	Trichloroethene µg/L Result
16RW10	10/26/2021	27.8	950
(cont.)	01/26/2022	4.1	1300
16RW11	03/17/2020	< 2 U	20
	07/21/2020	< 0.05 U	8.9 J-
	10/21/2020	< 0.05 U	3.7
	02/03/2021	< 0.25 UJ	2.2
	04/21/2021	0.0617 J	2
	07/22/2021	< 0.5 U	2.3
	10/21/2021	< 0.2 U	1.3 J
	01/26/2022	< 0.2 U	1.1
16SW01	10/11/2018	< 2 U	< 0.5 U
	10/11/2018	< 2 U	< 0.5 U
	03/31/2020	< 2 U	< 0.5 U
	07/28/2020	< 0.05 U	< 0.5 U
	10/26/2020	< 0.05 U	< 0.5 U
	01/27/2021	< 0.05 U	< 0.5 U
	04/19/2021	< 0.25 U	< 0.5 U
	07/26/2021	< 0.05 U	< 0.5 U
	01/26/2022	0.18 J	< 0.5 U
16SW02	10/11/2018	< 2 U	< 0.5 U
	03/31/2020	< 2 U	< 0.5 U
	07/28/2020	< 0.05 U	< 0.5 U
	10/26/2020	< 0.05 U	< 0.5 U
	01/27/2021	< 0.05 U	< 0.5 U
	04/19/2021	< 0.25 U	< 0.5 U
	07/26/2021	< 0.05 U	< 0.5 U
	01/26/2022	0.17 J	< 0.5 U
16SW03	10/11/2018	< 2 U	< 0.5 U
	03/31/2020	< 2 U	< 0.5 U
	07/28/2020	< 0.05 U	< 0.5 U
	10/26/2020	< 0.05 U	< 0.5 U
	01/27/2021	< 0.05 U	< 0.5 U
	04/19/2021	< 0.25 U	< 0.5 U
	07/26/2021	< 0.05 U	< 0.5 U
	01/26/2022	0.18 J	< 0.5 U
16WW12	05/23/2013	248	3290
	10/12/2018	12	4100
	09/18/2019	120	2100
	03/11/2020	53	1700
	07/21/2020	61.5	2800
	10/21/2020	18.5	1500
	02/03/2021	24.1 J	1100
	04/21/2021	42.1	2100
	07/28/2021	16	1700

Table 3-1
Historical Data

Well ID	Parameter Date	Perchlorate µg/L Result	Trichloroethene µg/L Result
16WW12	10/21/2021	23.2	1000 J
(cont.)	01/26/2022	30.5	1100
16WW13	05/21/2013	< 0.2 U	50.4
	10/12/2018	< 2 U	4400
	09/18/2019	< 2 U	630
	03/12/2020	< 2 U	7.5
	07/23/2020	0.134	190
	10/22/2020	< 0.05 U	1100
	01/22/2021	< 0.05 UJ	97
	04/19/2021	0.292	22
	07/26/2021	< 0.5 U	1500
	10/26/2021	< 0.2 U	2800
	01/27/2022	< 1 U	2300
16WW14	05/21/2013	1.32	72.1
	10/10/2018	< 2 U	42
	09/16/2019	< 2 U	25
	03/17/2020	< 2 U	33
	07/20/2020	0.544 J	42
	10/19/2020	< 0.05 U	25
	01/22/2021	< 0.05 UJ	18
	04/12/2021	< 0.05 U	17
	07/12/2021	0.21	8.4
	10/25/2021	< 0.2 U	12
	01/10/2022	0.21	17
16WW16	05/22/2013	443	22000
	10/10/2018	420	21000
	09/16/2019	460	13000
	03/11/2020	510	27000
	07/14/2020	442	28000
	10/08/2020	480	32000
	01/20/2021	309	5700
	04/15/2021	288	28000
	07/20/2021	408	30000
	10/13/2021	555	34000
	01/11/2022	561	29000
16WW21	10/12/2018	< 2 U	< 0.5 U
	03/16/2020	< 2 U	1.3
	07/15/2020	0.25	0.55 J
	10/14/2020	< 0.05 U	1.5
	02/03/2021	< 0.05 UJ	< 0.5 U
	04/15/2021	< 0.05 U	1.1
	07/20/2021	< 0.5 U	1
	10/19/2021	< 0.2 U	0.56 J
	01/13/2022	< 0.2 U	0.95 J

Table 3-1
Historical Data

Well ID	Parameter Date	Perchlorate µg/L Result	Trichloroethene µg/L Result
16WW22	05/21/2013	65.4	323
	10/10/2018	5.5	150
	09/17/2019	< 2 U	34
	03/16/2020	< 2 U	52
	07/15/2020	0.442 J	24
	10/14/2020	< 0.05 U	7.8
	01/25/2021	0.246 J	30
	04/15/2021	0.471	12
	07/20/2021	0.148	13
	10/19/2021	0.486	7.6
	01/11/2022	0.4	13
16WW23	05/20/2013	< 0.2 U	< 0.5 U
	10/12/2018	< 2 U	< 0.5 U
	09/17/2019	< 2 U	< 0.5 U
	03/31/2020	< 20 U	< 0.5 U
	07/27/2020	< 0.05 U	< 0.5 U
	10/08/2020	< 0.05 U	< 0.5 U
	01/28/2021	0.346 J	< 0.5 U
	04/22/2021	< 0.05 U	< 0.5 U
	07/14/2021	< 2 U	< 0.5 U
	10/13/2021	< 0.2 UJ	1.8
	01/27/2022	< 1 U	< 0.5 U
16WW24	05/20/2013	< 0.2 U	< 0.5 U
	10/09/2018	< 2 U	< 0.5 U
	09/17/2019	< 2 U	< 0.5 U
	03/31/2020	< 2 U	< 0.5 U
	07/27/2020	2.38	< 0.5 U
	10/08/2020	< 0.05 U	< 0.5 U
	01/28/2021	< 0.5 U	< 0.5 U
	04/22/2021	< 0.05 U	< 0.5 U
	07/14/2021	< 0.5 U	< 0.5 U
	10/13/2021	< 0.2 U	1.2
	01/27/2022	< 0.2 U	< 0.5 U
16WW25	05/22/2013	< 0.2 U	< 0.5 U
	10/09/2018	< 2 U	< 0.5 U
	09/19/2019	< 2 U	< 0.5 U
	03/16/2020	< 2 U	0.85 J
	07/21/2020	0.512 J	0.58 J
	10/14/2020	0.077 J	< 0.5 U
	01/21/2021	< 0.5 U	< 0.5 U
	04/20/2021	< 0.25 U	< 0.5 U
	07/13/2021	< 1 U	< 0.5 U
	10/14/2021	< 0.2 U	< 0.5 U
	01/12/2022	< 0.2 U	< 0.5 U

Table 3-1
Historical Data

Well ID	Parameter Date	Perchlorate µg/L Result	Trichloroethene µg/L Result
16WW26	05/23/2013	0.262 J	4580
	10/09/2018	< 2 U	2400
	09/17/2019	< 2 U	380
	09/18/2019	< 2 U	440
	03/09/2020	< 2 U	900
	07/21/2020	0.025 J	490
	10/14/2020	< 0.05 U	850
	01/21/2021	< 0.05 U	1000
	04/20/2021	< 0.05 U	130
	07/13/2021	< 1 U	26
	10/14/2021	< 0.2 U	500
	01/12/2022	< 0.2 U	440
16WW27	05/20/2013	< 0.2 U	< 0.5 U
	10/12/2018	< 2 U	< 0.5 U
	09/17/2019	< 2 U	< 0.5 U
	03/12/2020	< 2 U	1.1
	07/23/2020	< 0.5 U	< 0.5 U
	10/22/2020	< 0.05 U	1.2
	01/28/2021	< 0.5 U	< 0.5 U
	04/22/2021	< 0.05 U	< 0.5 U
	07/28/2021	< 0.25 U	< 0.5 U
	10/18/2021	< 0.2 U	< 0.5 U
	01/25/2022	< 0.2 U	< 0.5 U
16WW29	05/21/2013	< 0.2 U	1.07
	10/15/2018	< 2	3.3
	09/18/2019	< 2 U	2.7
	03/30/2020	< 2 U	< 0.5 U
	07/15/2020	< 0.5 U	< 0.5 U
	10/14/2020	< 0.05 U	< 0.5 U
	01/21/2021	< 0.05 U	0.99 J
	04/20/2021	< 0.05 U	< 0.5 U
	07/20/2021	< 0.25 U	< 0.5 U
	10/14/2021	< 0.2 U	0.64 J
	01/12/2022	< 0.2 U	< 0.5 U
16WW30	05/23/2013	< 0.2 U	203
	10/12/2018	< 2 U	1.8
	09/18/2019	< 2 U	360
	03/30/2020	< 2 U	14
	07/15/2020	0.309 J	3.5
	10/14/2020	< 0.05 U	5.7
	01/21/2021	< 0.05 U	2.2
	04/20/2021	< 0.05 U	11
	07/20/2021	< 0.05 U	12
	10/14/2021	< 0.2 UJ	32

Table 3-1
Historical Data

Well ID	Parameter Date	Perchlorate µg/L Result	Trichloroethene µg/L Result
16WW30	01/12/2022	< 0.2 U	31
16WW31	05/22/2013	< 0.2 U	< 0.5 U
	10/10/2018	< 2 U	< 0.5 U
	03/12/2020	< 2 U	1.1
	07/27/2020	1.31	< 0.5 U
	10/19/2020	< 0.05 U	< 0.5 U
	01/19/2021	< 0.05 U	< 0.5 U
	04/12/2021	< 0.05 U	< 0.5 U
	07/12/2021	< 2.5 U	< 0.5 U
	10/18/2021	< 0.2 U	< 0.5 U
	01/11/2022	< 0.2 U	< 0.5 U
16WW32	05/21/2013	< 0.2 U	< 0.5 U
	10/11/2018	< 2	< 0.5 U
	03/12/2020	< 2 U	9.9
	07/27/2020	< 0.05 U	< 0.5 U
	10/19/2020	< 0.05 U	< 0.5 U
	01/19/2021	< 0.05 U	< 0.5 U
	04/12/2021	< 0.05 U	< 0.5 U
	07/12/2021	< 5 U	< 0.5 U
	10/18/2021	< 0.2 U	< 0.5 U
	01/10/2022	0.089 J	< 0.5 U
16WW33	05/18/2013	< 0.2 U	< 0.5 U
	10/10/2018	< 2 U	< 0.5 U
	03/12/2020	< 2 U	79
	07/23/2020	< 0.5 U	< 0.5 U
	10/19/2020	0.0259 J	< 0.5 U
	02/03/2021	< 0.05 UJ	< 0.5 U
	04/12/2021	< 0.05 U	< 0.5 U
	07/12/2021	< 5 U	< 0.5 U
	10/18/2021	< 0.2 U	< 0.5 U
	01/10/2022	0.12 J	< 0.5 U
16WW34	05/20/2013	< 0.2 U	< 0.5 U
	10/10/2018	< 2 U	< 0.5 U
	03/12/2020	< 2 U	130
	07/23/2020	< 0.5 U	< 0.5 U
	10/19/2020	< 0.05 U	< 0.5 U
	02/03/2021	< 0.05 UJ	< 0.5 U
	04/12/2021	< 0.05 U	< 0.5 U
	07/12/2021	< 2.5 U	< 0.5 U
	10/18/2021	< 0.2 U	< 0.5 U
	01/10/2022	0.14 J	0.51 J
16WW35	05/22/2013	310	4830
	10/10/2018	420	21000
	09/18/2019	410	13000

Table 3-1
Historical Data

Well ID	Parameter Date	Perchlorate µg/L Result	Trichloroethene µg/L Result
16WW35 (cont.)	03/11/2020	560	11000
	07/14/2020	451	9500
	10/13/2020	565	11000
	01/20/2021	< 0.5 U	13000
	04/13/2021	367	9300
	07/14/2021	352	8100
	10/13/2021	366	9700
	01/11/2022	342	11000
16WW36	05/22/2013	< 0.2 U	4220
	10/09/2018	< 2 U	22000
	09/16/2019	< 2 U	15000
	03/11/2020	< 2 U	18000
	07/14/2020	< 0.5 U	25000
	10/13/2020	0.167	22000
	01/20/2021	< 0.05 U	1500
	04/13/2021	1.26	10000
	07/14/2021	0.438 J	15000
	10/13/2021	0.291 J	8100
	01/11/2022	0.098 J	8100
16WW37	05/18/2013	10.4	305 J
	10/10/2018	< 2 U	84
	03/17/2020	< 2 U	110
	07/23/2020	< 0.5 U	87
	10/19/2020	0.393	120
	01/20/2021	0.786	99
	04/12/2021	1.6	110
	07/12/2021	2.74	89
	10/25/2021	168	190
	01/10/2022	55.3	180
16WW38	05/18/2013	< 0.2 U	745 J
	10/10/2018	< 2 U	4400
	03/17/2020	< 2 U	3000
	07/23/2020	< 0.5 U	2400
	10/19/2020	< 0.05 U	3800
	01/20/2021	< 0.05 U	2300
	04/12/2021	< 0.05 U	2100
	07/12/2021	< 2.5 U	2000
	10/25/2021	< 0.2 U	1200
	01/10/2022	0.17 J	1200
16WW39	10/10/2018	120	3900
	09/17/2019	130	1200
	03/16/2020	62	1100
	07/15/2020	15.1	560
	10/14/2020	1.08	350

Table 3-1
Historical Data

Well ID	Parameter Date	Perchlorate µg/L Result	Trichloroethene µg/L Result
16WW39 (cont.)	02/03/2021	3.64 J	300
	04/15/2021	7.87	330
	07/28/2021	6.76	230
	10/25/2021	9.07	210 J
	01/11/2022	4	120
16WW40	05/23/2013	0.208 J	1060
	10/12/2018	< 2 U	660
	09/17/2019	< 2 U	740
	03/10/2020	< 2 U	1500
	07/21/2020	0.898 J	1700
	10/21/2020	0.24	1700
	02/03/2021	1.31 J	1500
	04/21/2021	0.88	1000
	07/27/2021	0.693 J	1900
	10/21/2021	0.622	1000 J
	01/26/2022	0.55	540
16WW41	05/22/2013	292	6550
	10/09/2018	60	9800
	09/17/2019	< 2 U	3900
	03/16/2020	310	6400
	07/15/2020	155	6200
	10/14/2020	81.2	5400
	01/25/2021	3.71 J	5400
	04/15/2021	212	6200
	07/20/2021	107	5400
	10/19/2021	66.5	1900
	01/13/2022	59.1	3800
16WW42	05/21/2013	< 0.2 U	1.31
	10/12/2018	< 2 U	6
	09/16/2019	< 2 U	29
	03/10/2020	< 2 U	3.3
	07/23/2020	< 0.05 U	1.3
	10/22/2020	< 0.05 U	3.2
	01/28/2021	< 0.05 U	0.59 J
	04/19/2021	< 0.05 U	0.97 J
	07/26/2021	< 0.05 U	1.1
	10/26/2021	< 0.2 U	180
	01/27/2022	< 1 U	190
16WW43	05/20/2013	< 0.2 U	< 0.5 U
	10/09/2018	< 2 U	< 0.5 U
	09/17/2019	< 2 U	< 0.5 U
	03/12/2020	< 2 U	0.61 J
	07/23/2020	0.0428 J	< 0.5 U
	10/22/2020	< 0.05 U	0.94 J

Table 3-1
Historical Data

Well ID	Parameter Date	Perchlorate µg/L Result	Trichloroethene µg/L Result
16WW43 (cont.)	01/28/2021	0.0777 J	< 0.5 U
	04/22/2021	< 0.25 U	< 0.5 U
	07/28/2021	< 0.05 U	< 0.5 U
	10/18/2021	< 0.2 U	< 0.5 U
	01/25/2022	< 0.2 U	< 0.5 U
16WW44	05/20/2013	< 0.2 U	< 0.5 U
	10/10/2018	< 2 U	< 0.5 U
	03/17/2020	< 2 U	< 0.5 U
	07/20/2020	< 0.05 U	< 0.5 U
	10/19/2020	< 0.05 U	< 0.5 U
	01/22/2021	< 0.05 UJ	< 0.5 U
	04/12/2021	0.134	< 0.5 U
	07/12/2021	1.35	< 0.5 U
	10/25/2021	< 0.2 U	< 0.5 U
	01/10/2022	3.2	0.5 J
16WW45	05/21/2013	< 0.2 U	< 0.5 U
	10/10/2018	< 2 U	< 0.5 U
16WW46	05/21/2013	< 0.2 U	0.647 J
	10/12/2018	< 2 U	3
	03/12/2020	< 2 U	2.7
	07/27/2020	4.07	0.57 J
	10/19/2020	< 0.05 U	0.66 J
	01/19/2021	< 0.05 U	< 0.5 U
	04/12/2021	< 0.5 U	< 0.5 U
	07/27/2021	< 1 U	0.63 J
	10/18/2021	< 0.2 U	< 0.5 U
	01/11/2022	0.098 J	0.82 J
16WW48	10/18/2018	14	8800
	09/18/2019	< 2 U	3700
	03/30/2020	120	7100
	07/15/2020	157	9000
	10/20/2020	167	14000 J+
	01/21/2021	122	13000
	04/22/2021	94.7	15000
	07/13/2021	53.7	13000
	10/19/2021	37.9	15000
	01/13/2022	14.8	13000
16WW49	09/19/2019	< 2 U	260
	03/16/2020	< 2 U	8.3
	07/27/2020	2.41	36
	10/20/2020	< 0.05 U	4.8
	01/29/2021	< 0.5 U	2.5
	04/22/2021	< 0.05 U	11
	07/28/2021	0.0291 J	19

Table 3-1
Historical Data

Well ID	Parameter Date	Perchlorate µg/L Result	Trichloroethene µg/L Result
16WW49	10/19/2021	< 0.2 U	30
(cont.)	01/13/2022	< 0.2 U	46
16WW51	02/06/2019		68
	09/18/2019	< 2 U	90
	03/17/2020	< 2 U	830
	07/27/2020	2.86	1300
	10/20/2020	< 0.05 U	1700
	01/29/2021	< 0.5 U	1000
	04/15/2021	0.306	560
	07/20/2021	< 0.05 U	1800
	10/19/2021	< 0.2 U	2500
	01/13/2022	< 0.2 U	3200
16WW55	10/15/2018	400	5900
	09/17/2019	480	3200
	03/25/2020	360	4300
	07/14/2020	263	4500
	10/13/2020	287	4400
	01/20/2021	259	2900
	04/20/2021	198	2200
	07/13/2021	125	1900
	10/14/2021	363	2900
	01/12/2022	297	2500
16WW56	02/06/2019		40
	09/17/2019	< 2 U	27
	03/16/2020	< 2 U	520
	07/15/2020	< 0.5 U	9.3
	10/21/2020	0.309	270
	01/25/2021	< 0.1 UJ	29
	04/15/2021	0.0783 J	14
	07/20/2021	< 0.05 U	12
	10/19/2021	< 0.2 U	6.2
	01/11/2022	0.13 J	7
16WW57	08/15/2019	< 2 U	25
	09/18/2019	< 2 U	24
	08/17/2020	0.454 J	69 J+
	10/08/2020	< 0.05 U	72
	01/27/2021	< 0.5 UJ	65 J
	04/13/2021	0.171 J	57
	07/14/2021	< 0.5 U	60
	10/13/2021	< 0.2 UJ	75
	01/13/2022	0.099 J	85
16WW58	08/15/2019	< 2 U	2700
	09/18/2019	< 2 U	4300
	08/17/2020	< 0.5 U	3400

Table 3-1
Historical Data

Well ID	Parameter Date	Perchlorate µg/L Result	Trichloroethene µg/L Result
16WW58 (cont.)	10/08/2020	< 0.05 U	4400
	01/27/2021	< 0.25 U	2700
	04/13/2021	0.0348 J	1100
	07/14/2021	< 1 U	1000
	10/13/2021	< 0.2 UJ	3300
	01/13/2022	< 0.2 U	5500

Table 3-2
RA-O Mann-Kendall Trend Summary, LHAAP-16

Monitoring Well	Area	1,1-DCE	1,2-DCA	cis-1,2-DCE	TCE	VC	Perchlorate
16IW09 [a]	Landfill Biobarrier 1	NA	NA	NA	Decreasing	NA	NA
16RW04	Landfill Biobarrier 1	NA	NA	Probably Decreasing	Decreasing	Stable	NA
16IW03	Landfill Biobarrier 2	Stable	No Trend	Stable	Stable	Probably Increasing	NA
16PM06	Landfill Biobarrier 2	Decreasing	Probably Decreasing	Decreasing	Stable	Decreasing	NA
16IW10 [a]	Landfill Biobarrier 3	NA	NA	Decreasing	Decreasing	Decreasing	
16RW10 [a]	Landfill Biobarrier 3	Decreasing	Stable	Stable	Stable	Stable	Decreasing
16IW20 [a]	Bayou Barrier	NA	Decreasing	Decreasing	Decreasing	Probably Increasing	NA
16WW40	Bayou Barrier	Stable	No Trend	Stable	No Trend	No Trend	NA
16EW02	Mid Plume Shallow	Stable	No Trend	No Trend	Stable	No Trend	No Trend
16EW03	Mid Plume Shallow	Probably Decreasing	Decreasing	Probably Decreasing	Probably Decreasing	No Trend	NA
16WW48	Mid Plume Shallow	Increasing	No Trend	Increasing	Increasing	Increasing	Stable
16WW49	Mid Plume Intermediate	NA	NA	Decreasing	No Trend	NA	NA
16WW51	Mid Plume Intermediate	NA	NA	Increasing	Increasing	NA	NA

Notes:

[a] COCs where decreasing trends are observed are below the MCL during the most recent sampling event.

MCL - maximum contaminant level

NA - Not analyzed due to concentrations below the MCL.

PCE - tetrachloroethene

RA-O - remedial action operation

TCE - trichloroethene

Table 3-3
USEPA Screening for Anaerobic Biodegradation Processes

				Location Code	16WW16			16WW22			16WW26			16WW35			16WW36			16WW41			16WW48			16WW55			16WW56			16WW57			16WW58		
				Sample ID	16WW16-220111			16WW22-220111			16WW26-220112			16WW35-220111			16WW36-220111			16WW41-220113			16WW48-220113			16WW55-220112			16WW56-220111			16WW57-220113			16WW58-220113		
				Sample Date	1/11/2022			1/11/2022			1/12/2022			1/11/2022			1/11/2022			1/13/2022			1/13/2022			1/12/2022			1/11/2022			1/13/2022			1/13/2022		
				Sample Purpose	REG			REG			REG			REG			REG			REG			REG			REG			REG			REG			REG		
Parameter	Units	Score if Parameter Exceeds	Score if Parameter is Less than		Result	VQ	Score	Result	VQ	Score	Result	VQ	Score	Result	VQ	Score	Result	VQ	Score	Result	VQ	Score	Result	VQ	Score	Result	VQ	Score	Result	VQ	Score	Result	VQ	Score	Result	VQ	Score
Dissolved oxygen	mg/L	5	0.5		0.73			0.61			0.59			0.45		3	0.54			0.56			0.7			0.89			0.69			0.58			0.77		
Nitrate	mg/L	NV	1		0.0442	J	2	0.0496	J	2	0.0479	J	2	0.262	J	2	0.225	J	2	0.188	J	2	0.212	J	2	0.364		2	0.0514	J	2	0.215	J	2	0.0416	J	2
Sulfate	mg/L	NV	20		372			157			372			8,090			2,310			6,990			3,130			581			106			2,650	J		594		
Methane	µg/L	500	500		490	J	0	1.86	J	0	4.01		0	76.6	J	0	101	J	0	7.22		0	2.69		0	26.8		0	2.29	J	0	2.6	J	0	4.57		0
Oxidation Reduction Potential	mV	NV	50		191			139			155			125			154			44		1	66			64			131			106			118		
pH	Std. Units	NV	NV		6.14		0	6.33		0	5.04		0	7.14		0	6.58		0	6.57		0	6.33		0	6.07		0	6.07		0	5.74		0	5.91		0
Total organic carbon	mg/L	20	NV		4.69	J		6.19			4.58	J		53.1		2	21.7		2	43		2	13.7			5.05			1.14			19.8			9.26		
Temperature	deg. C	NV	NV		14.77			13.88			14.96			10.47			14.82			17.11			18.39			16.09			15.51			13.5			14.86		
Alkalinity	mg/L	NV	NV		365		0	214		0	43		1	1,000		1	490		1	908		1	411		1	305		0	165			191		0	144		0
Trichloroethene	µg/L	0	NV		29,000		0	13		0	440		0	11,000		0	8,100		0	3,800		0	13,000		0	2,500		0	7		0	85		0	5,500		0
cis-1,2-Dichloroethene	µg/L	0	NV		14,000		2	2.9		2	44		2	4,400		2	6,700		2	1,600		2	13,000		2	470		2	0.67	J	2	0.66	J	2	170		2
Vinyl chloride	µg/L	0	NV		170		2	< 0.5	U	0	0.65	J	2	58		2	49		2	210		2	48		2	8.2	J	2	< 0.5	U		< 0.5	U		< 5	U	
Ethylene	µg/L	10	NV		3.93	J		1.04	J		0.997	J		3.47	J		3.3	J		8.32	J		< 0.5	UJ		2.22	J		1.19	J		1.45	J		3.72	J	
Ethane	µg/L	10	NV		2.63			< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U	
Sum of Screening Scores					6			4			7			12			9			10			7			6			4			4			4		
Scoring Interpretation					Limited Evidence for Anaerobic Biodegradation			Inadequate Evidence for Anaerobic Biodegradation			Limited Evidence for Anaerobic Biodegradation			Limited Evidence for Anaerobic Biodegradation			Limited Evidence for Anaerobic Biodegradation			Limited Evidence for Anaerobic Biodegradation			Limited Evidence for Anaerobic Biodegradation			Limited Evidence for Anaerobic Biodegradation			Inadequate Evidence for Anaerobic Biodegradation			Inadequate Evidence for Anaerobic Biodegradation			Inadequate Evidence for Anaerobic Biodegradation		
Mann-Kendall Analysis					Increasing trend for TCE No trend for perchlorate			Decreasing trend for TCE No trend for perchlorate			Stable trend for TCE No trend for perchlorate			Probably decreasing trend for TCE Probably decreasing trend for perchlorate			Decreasing trend for TCE Probably increasing trend for perchlorate			Decreasing trend for TCE Stable trend for perchlorate			Increasing trend for TCE Stable trend for perchlorate			Decreasing trend for TCE Probably decreasing trend for perchlorate			Decreasing trend for TCE No trend for perchlorate			Probably increasing trend for TCE No trend for perchlorate			Stable trend for TCE No trend for perchlorate		

Notes:

Highlighted cells indicate concentrations greater than concentration range provided in Table 2-3 of USEPA document.

Bolded results indicates concentration below the concentration range provided in Table 2-3 of the USEPA document.

Reference Document for Scoring Process: *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater* .

0 to 5 - Inadequate evidence for anaerobic biodegradation of chlorinated organics.

6 to 14 - Limited evidence for anaerobic biodegradation of chlorinated organics.

15 to 20 - Adequate evidence for anaerobic biodegradation of chlorinated organics.

> 20 - Strong evidence for anaerobic biodegradation of chlorinated organics.

µg/L - micrograms per liter

J - The analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.

U - Not detected. The analyte was analyzed for, but not detected above the associated reporting limit.

deg. C - degrees Celsius

ID - identifier

mg/L- milligrams per liter

mV - millivolts

NV - no value

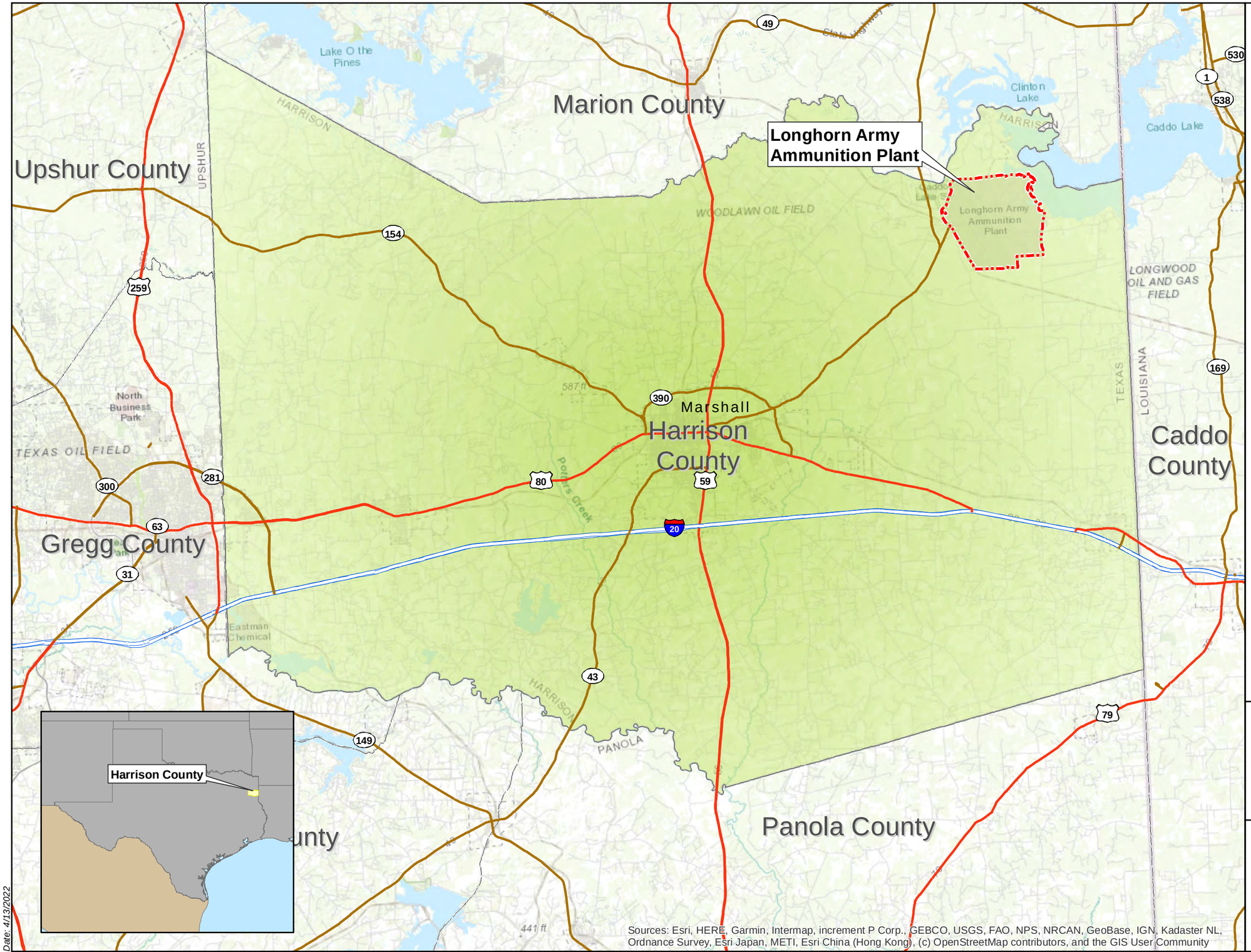
REG - regular sample

Std. Units - standard pH units

TCE - trichloroethene

VQ - validation qualifier

Figures



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Figure 1-1

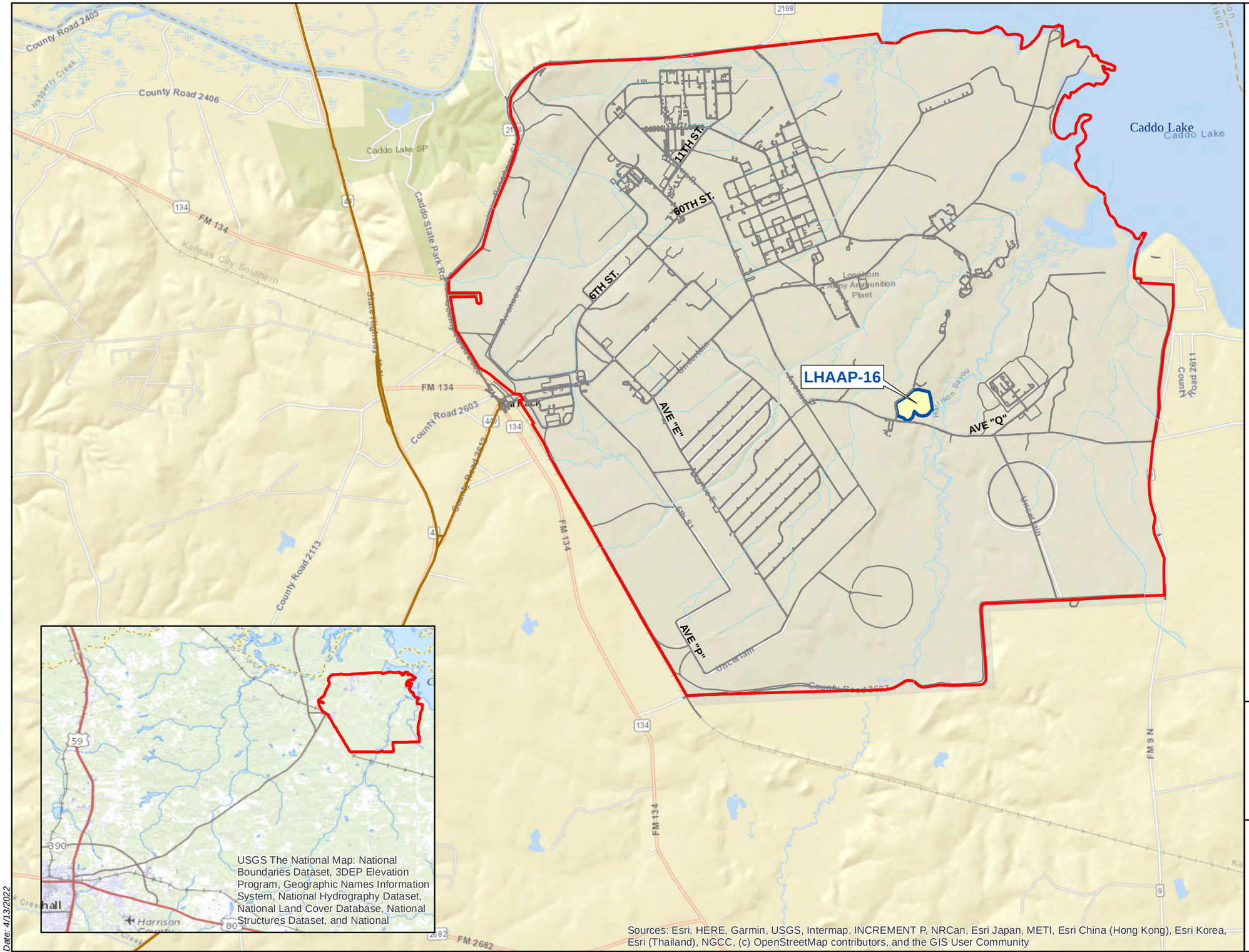
LHAAP Location Map
Second Annual RA-O Report
LHAAP-16

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Date: 4/13/2022

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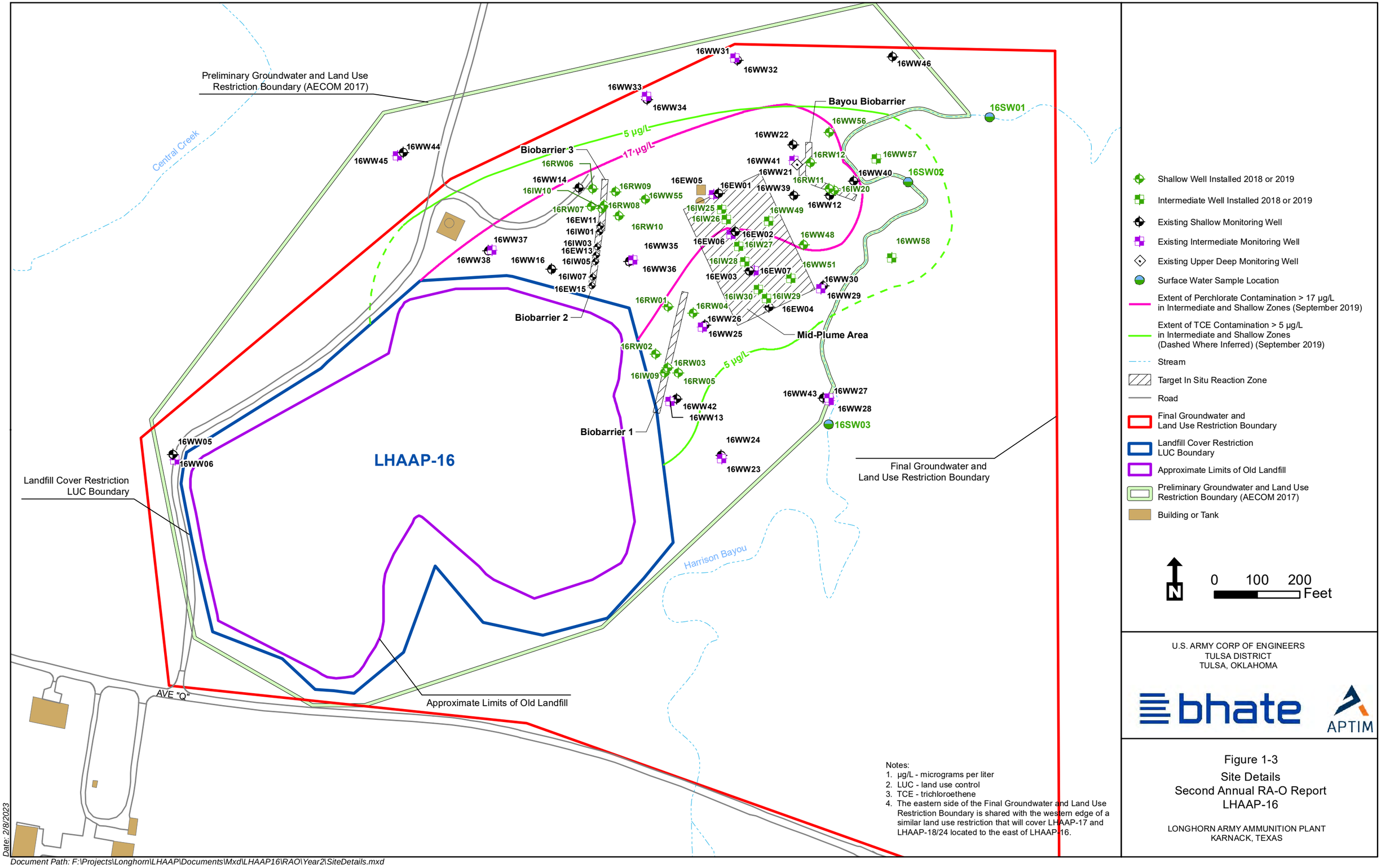
Figure 1-2

LHAAP Site Location Map
Second Annual RA-O Report
LHAAP-16

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 4/13/2022

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP16\RAO\Year2\LHAAP_SiteLocationMap.mxd



Notes:
1. µg/L - micrograms per liter
2. LUC - land use control
3. TCE - trichloroethene
4. The eastern side of the Final Groundwater and Land Use Restriction Boundary is shared with the western edge of a similar land use restriction that will cover LHAAP-17 and LHAAP-18/24 located to the east of LHAAP-16.

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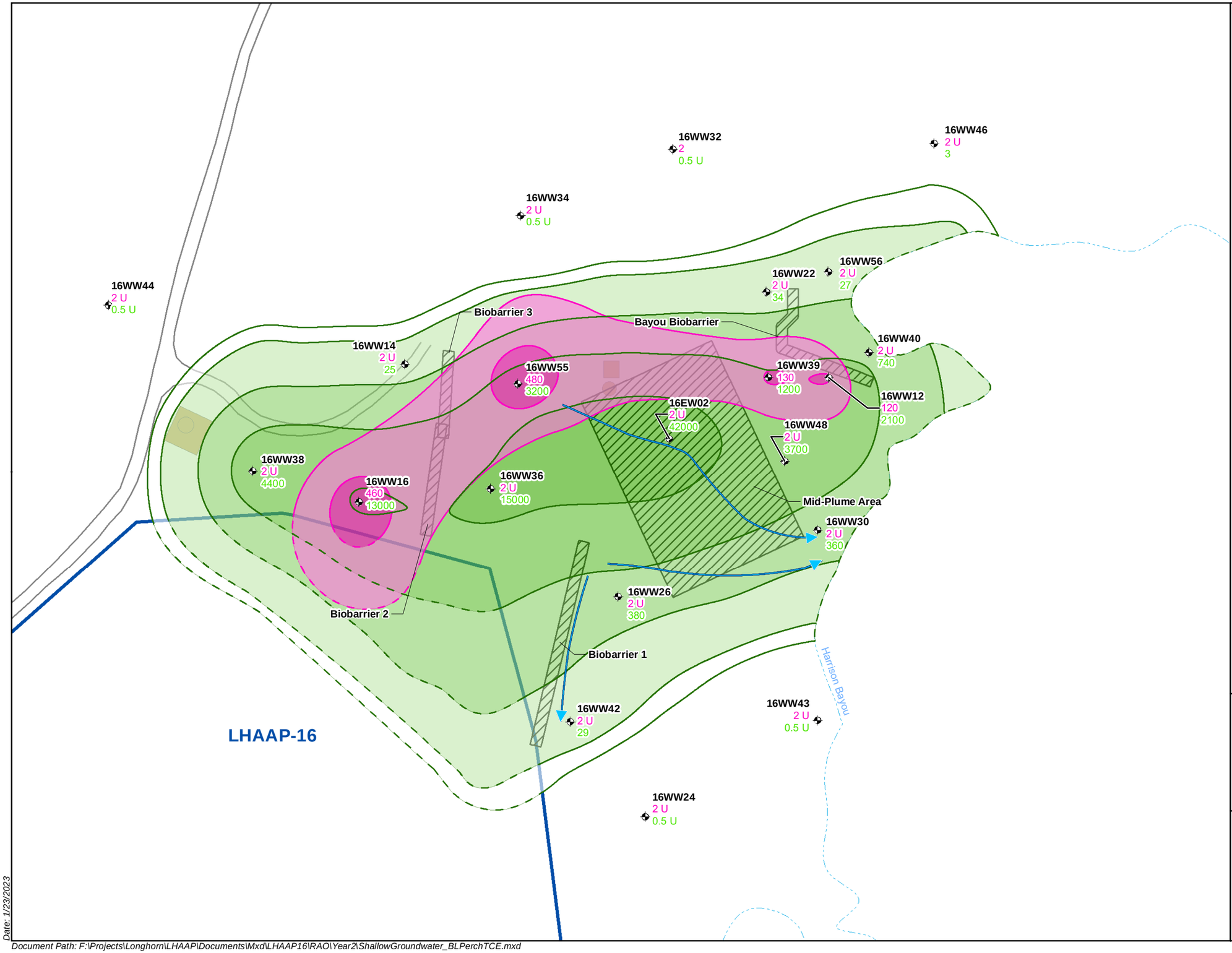
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Figure 1-3
Site Details
Second Annual RA-O Report
LHAAP-16

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 2/8/2023

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Existing Shallow Monitoring Well
Groundwater Flow Direction
Sub Area
Stream
Road
LHAAP-16 Landfill Fence
Building or Tank

Perchlorate Plume (µg/L)
17 - 100
>100

Trichloroethene (TCE) Plume (µg/L)
5 - 10
10 - 100
100 - 1,000
1,000 - 10,000
>10,000

Notes:
1. Perchlorate MCL/PCL = 17 µg/L
TCE MCL/PCL = 5 µg/L
2. Qualifiers:
J - Estimated: The analyte was positively identified; the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U - Undetected: The analyte was analyzed for, but not detected.
3. µg/L = micrograms per liter

N
0 65 130
Feet

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Figure 1-4

Shallow Zone TCE and Perchlorate Plumes
Pre-remedy (2018/2019)
Second Annual RA-O Report
LHAAP-16

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 1/23/2023

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP16\RAO\Year2\ShallowGroundwater_BLPerchTCE.mxd



Existing Intermediate Monitoring Well
Groundwater Flow Direction
Sub Area
Stream
Road
LHAAP-16 Landfill Fence
Building or Tank

Perchlorate Plume (µg/L)
- 17 - 100
- >100

Trichloroethene (TCE) Plume (µg/L)
- 5 - 10
- 10 - 100
- 100 - 1,000
- 1,000 - 10,000
- >10,000

Notes:
1. Perchlorate MCL/PCL = 17 µg/L
TCE MCL/PCL = 5 µg/L
2. Qualifiers:
J - Estimated: The analyte was positively identified; the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U - Undetected: The analyte was analyzed for, but not detected.
3. µg/L = micrograms per liter

N

0 65 130 Feet

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Figure 1-5

Intermediate Zone TCE and Perchlorate Plumes
Pre-remedy (2018/2019)
Second Annual RA-O Report
LHAAP-16

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 1/23/2023

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP16\RAO\Year2\IntermediateGroundwater_BLPerchTCE.mxd

16WW31
16WW32
16WW46
16WW33
16WW34
16WW44
16WW56
16WW22
16WW41
16WW21
16WW57
Biobarrier Bayou
16WW14
16RW06
16EW05
16EW01
16WW40
16RW09
16WW39
16RW11
16IW20
16WW55
Biobarrier 3
16WW12
16RW07
16IW10
16WW49
16RW10
16EW02
16PM03
16PM14
16EW06
Mid-Plume Area
16WW48
16WW38
16WW37
16IW03
16PM06
16WW35
16WW58
16WW16
16PM02
16WW36
16EW03
16EW07
16WW51
Biobarrier 2
16WW30
16PM09
16WW29
16RW01
16EW04
16EW08
16RW04
16WW25
16WW26
Biobarrier 1
16SW01
16RW02
16RW05
16IW09
Harrison Bayou
16WW43
16WW27
LHAAP-16
16WW42
16WW13
16WW24
16WW23

Surface Water Sampling Location
Existing Shallow Monitoring Well
Existing Intermediate Monitoring Well
Existing Upper Deep Monitoring Well
Shallow Recovery Well
Sub Area
Stream
Road
LHAAP-16 Landfill Fence
Building or Tank

N
0 50 100
Feet

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Figure 2-1
RA-O Monitoring Network
First Annual RA-O Report
LHAAP-16

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 1/26/2022

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP16\RAO\Year1\RAOMonitoringNetwork.mxd

16WW32 (175.05)
16WW46 (173.59)
16WW34 (175.28)
16WW44 (176.52)
Bayou Biobarrier
16WW22 (174.62)
16WW56 (173.61)
16RW06 (175.27)
Biobarrier 3
16WW14 (175.64)
16RW09 (175.13)
16WW55 (174.86)
16IW10 (175.25)
16EW01 (175.32)
16WW39 (173.87)
16RW11 (173.48)
16WW40 (172.66)
16RW07 (175.43)
16RW10 (175.16)
16IW20 (173.31)
16EW02 (175.49)
16WW12 (173.76)
16PM03 (175.37)
16PM14 (175.03)
Mid-Plume Area
16WW48 (174.09)
16WW38 (176.22)
16IW03
16WW36 (175.49)
16EW03 (175.67)
16WW16 (175.74)
16PM02 (175.39)
16PM06 (175.32)
16WW30 (173.95)
16PM09 (175.03)
16EW04 (175.66)
16RW01 (174.45)
16RW04 (174.61)
Biobarrier 2
16WW26 (175.78)
16RW02 (176.77)
Biobarrier 1
16RW05 (176.38)
16IW09 (176.06)
16WW42 (175.15)
16WW43 (172.36)
Hawson Bayou
16WW24 (174.37)
LHAAP-16

Existing Shallow Monitoring Well
Shallow Recovery Well
Groundwater Flow Direction
Groundwater Contour
Groundwater Depression
Stream
Road
LHAAP-16 Landfill Fence
Building or Tank
Sub Area

Notes:
1. Groundwater elevation in feet above mean sea level.
2. Survey information not available for monitoring wells 16IW03 and 16IW04, therefore they were not used in the potentiometric map.

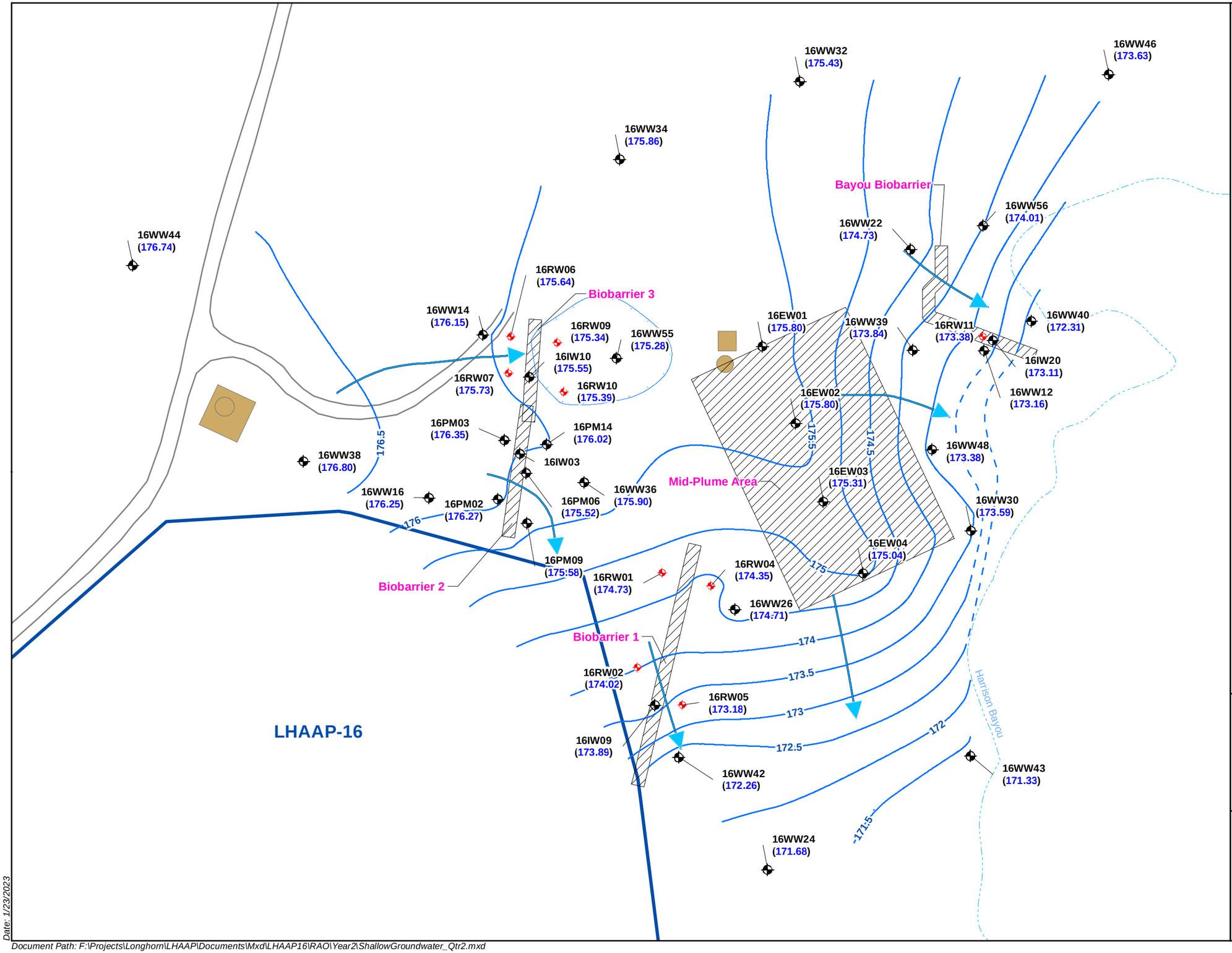
N
0 55 110
Feet

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Figure 2-2
Shallow Zone Potentiometric Surface Map
Year 2, Quarter 1 (April 2021)
Second Annual RA-O Report
LHAAP-16
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 1/23/2023
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- Existing Shallow Monitoring Well
- Shallow Recovery Well
- Groundwater Flow Direction
- Groundwater Contour
- Inferred Groundwater Contour
- Groundwater Depression
- Stream
- Road
- LHAAP-16 Landfill Fence
- Building or Tank
- Sub Area

Notes:
1. Groundwater elevation in feet above mean sea level.
2. Survey information not available for monitoring wells 16IW03 and 16IW04, therefore they were not used in the potentiometric map.

N

0 55 110 Feet

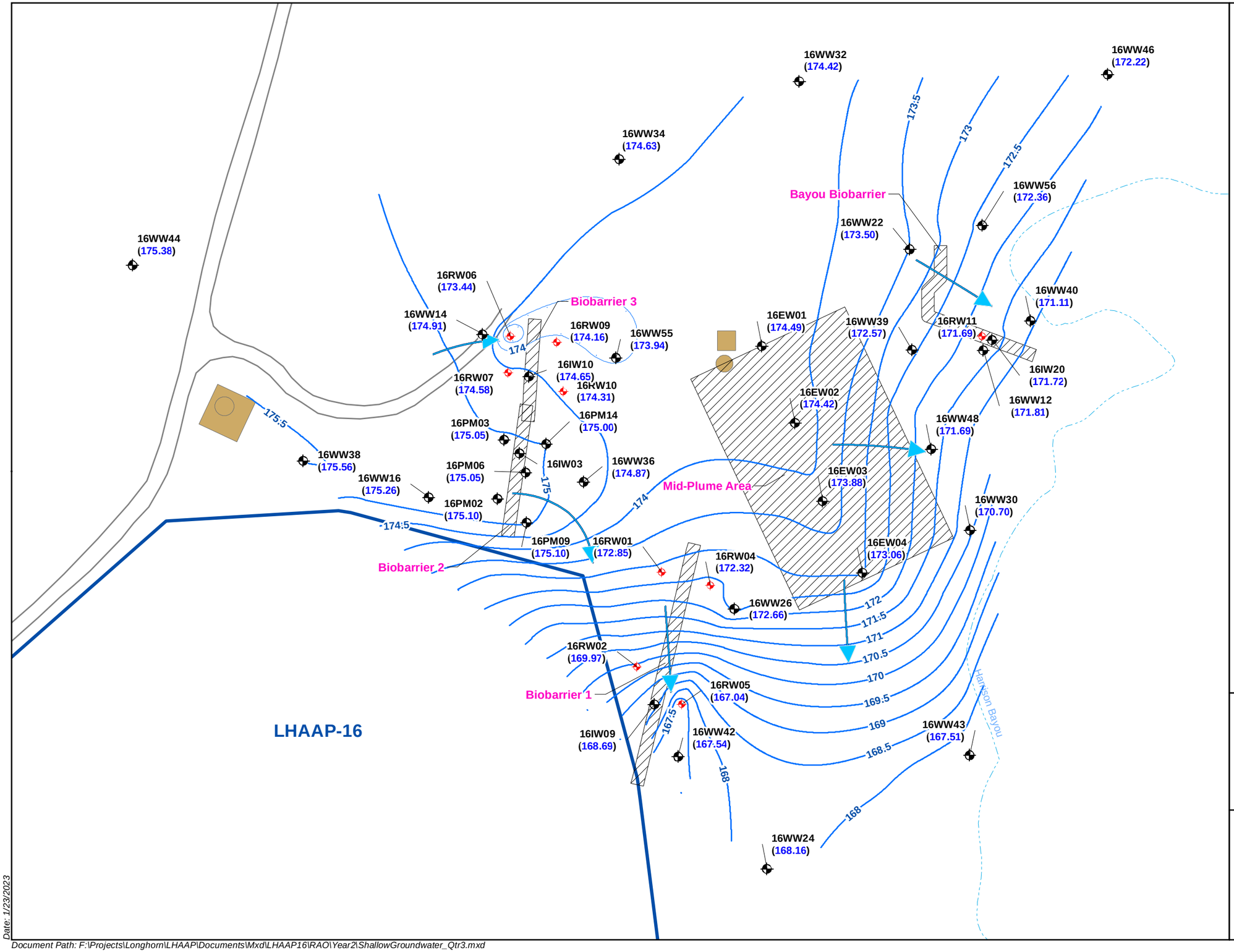
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Figure 2-3
Shallow Zone Potentiometric Surface Map
Year 2, Quarter 2 (July 2021)
Second Annual RA-O Report
LHAAP-16
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 1/23/2023

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP16\RAO\Year2\ShallowGroundwater_Qtr2.mxd



Notes:
1. Groundwater elevation in feet above mean sea level.
2. Survey information not available for monitoring wells 16IW03 and 16IW04, therefore they were not used in the potentiometric map.

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Figure 2-4
Shallow Zone Potentiometric Surface Map
Year 2, Quarter 3 (October 2021)
Second Annual RA-O Report
LHAAP-16

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 1/23/2023

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16WW44 (175.08)
16WW38 (175.09)
16WW16 (174.72)
16WW32 (173.57)
16WW34 (174.05)
16WW46 (171.92)
16WW56 (172.18)
16WW22 (173.13)
16WW40 (171.19)
16WW39 (172.42)
16WW55 (173.57)
16WW36 (174.41)
16WW48 (171.88)
16WW12 (171.73)
16WW30 (170.92)
16WW24 (168.70)
16WW43 (168.36)
16WW42 (168.89)
16RW06 (174.09)
16RW09 (173.71)
16RW10 (173.45)
16RW11 (171.64)
16RW07 (174.23)
16RW01 (172.77)
16RW04 (172.59)
16RW02 (169.81)
16RW05 (168.65)
16PM02 (174.99)
16PM03 (174.85)
16PM14 (174.75)
16PM06 (174.70)
16PM09 (174.93)
16IW10 (174.03)
16IW03
16IW04
16IW20 (171.57)
16IW09 (169.18)
16EW01 (174.32)
16EW02 (174.27)
16EW03 (173.70)
16EW04 (173.13)
16WW26 (172.80)
Biobarrier 1
Biobarrier 2
Biobarrier 3
Bayou Biobarrier
Mid-Plume Area
Harrison Bayou
LHAAP-16
175
174.5
174
173.5
173
172.5
172
171.5
171
170.5
170
169.5
169
168.5

Existing Shallow Monitoring Well
Shallow Recovery Well
Groundwater Flow Direction
Groundwater Contour
Groundwater Depression
Stream
Road
LHAAP-16 Landfill Fence
Building or Tank
Sub Area

Notes:
1. Groundwater elevation in feet above mean sea level.
2. Survey information not available for monitoring wells 16IW03 and 16IW04, therefore they were not used in the potentiometric map.

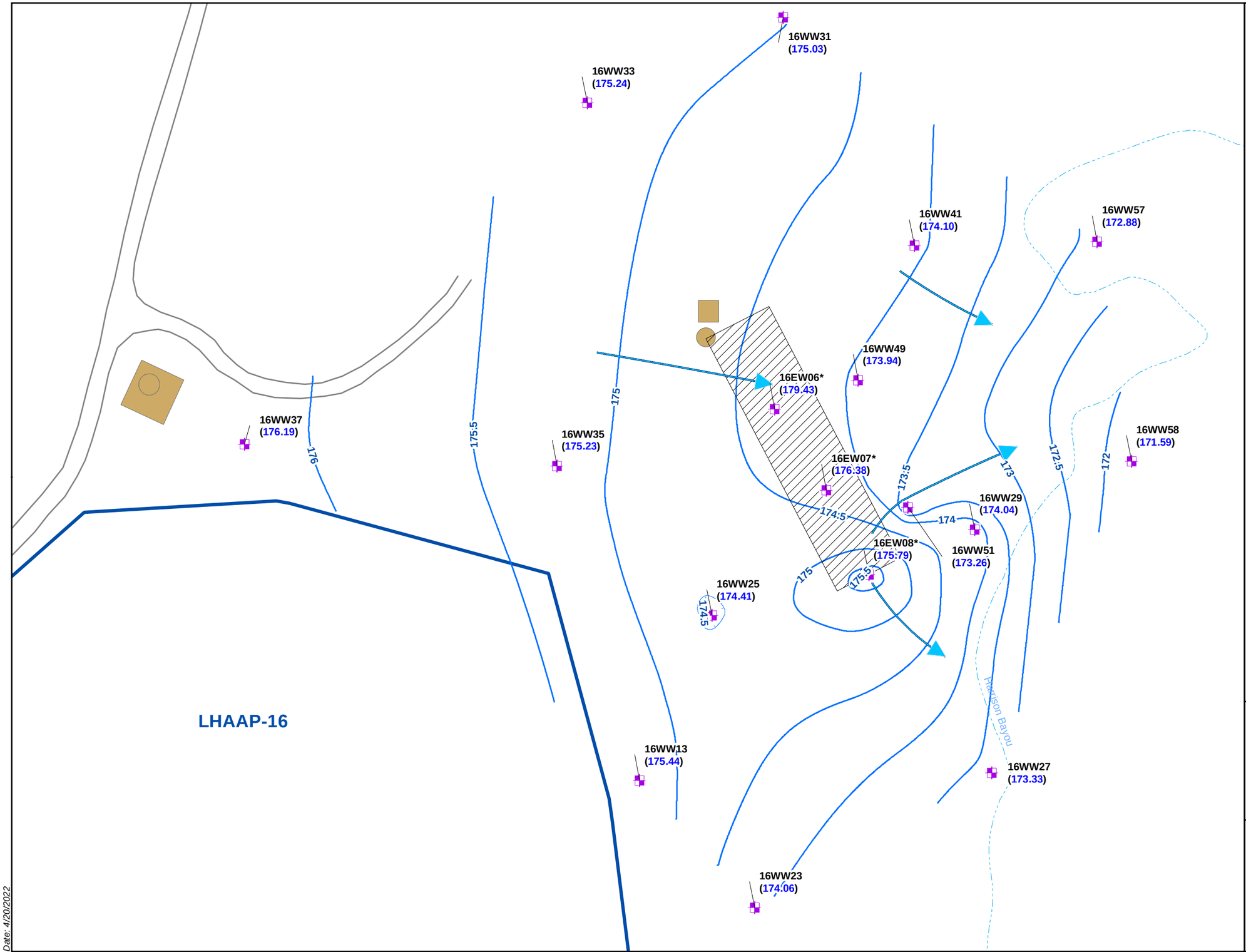
N
0 50 100
Feet

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Figure 2-5
Shallow Zone Potentiometric Surface Map
Year 2, Quarter 4 (January 2022)
Second Annual RA-O Report
LHAAP-16
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 1/23/2023
Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP16\RAO\Year2\ShallowGroundwater_Qtr4.mxd



Notes:
1. * = Groundwater elevation is anomalous and was not used to create potentiometric contours.
2. Groundwater elevation in feet above mean sea level.
3. 16EW08 was redeveloped due to siltation in October 2021 and the April 2021 groundwater elevation appears to be anomalously high.

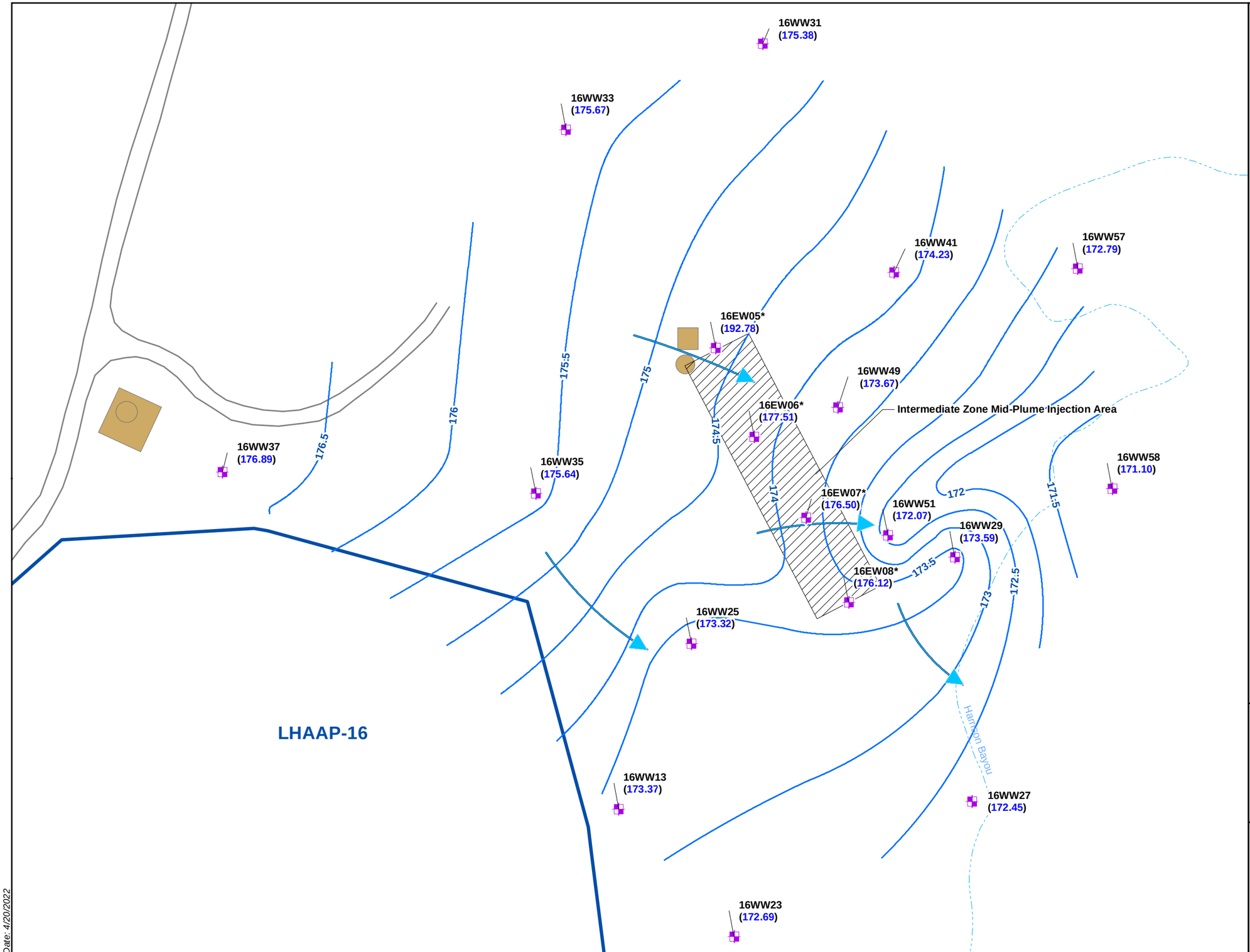
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Figure 2-6
Intermediate Zone Potentiometric Surface Map
Year 2, Quarter 1 (April 2021)
Second Annual RA-O Report
LHAAP-16
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 4/20/2022

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Existing Intermediate Monitoring Well
Groundwater Flow Direction
Groundwater Contour
Stream
Road
LHAAP-16 Landfill Fence
Building or Tank
Sub Area

Notes:
1. * = Groundwater elevation is anomalous and was not used to create potentiometric contours.
2. Groundwater elevation in feet above mean sea level.
3. 16EW08 was redeveloped due to siltation in October 2021 and the July 2021 groundwater elevation appears to be anomalously high.

N
0 50 100
Feet

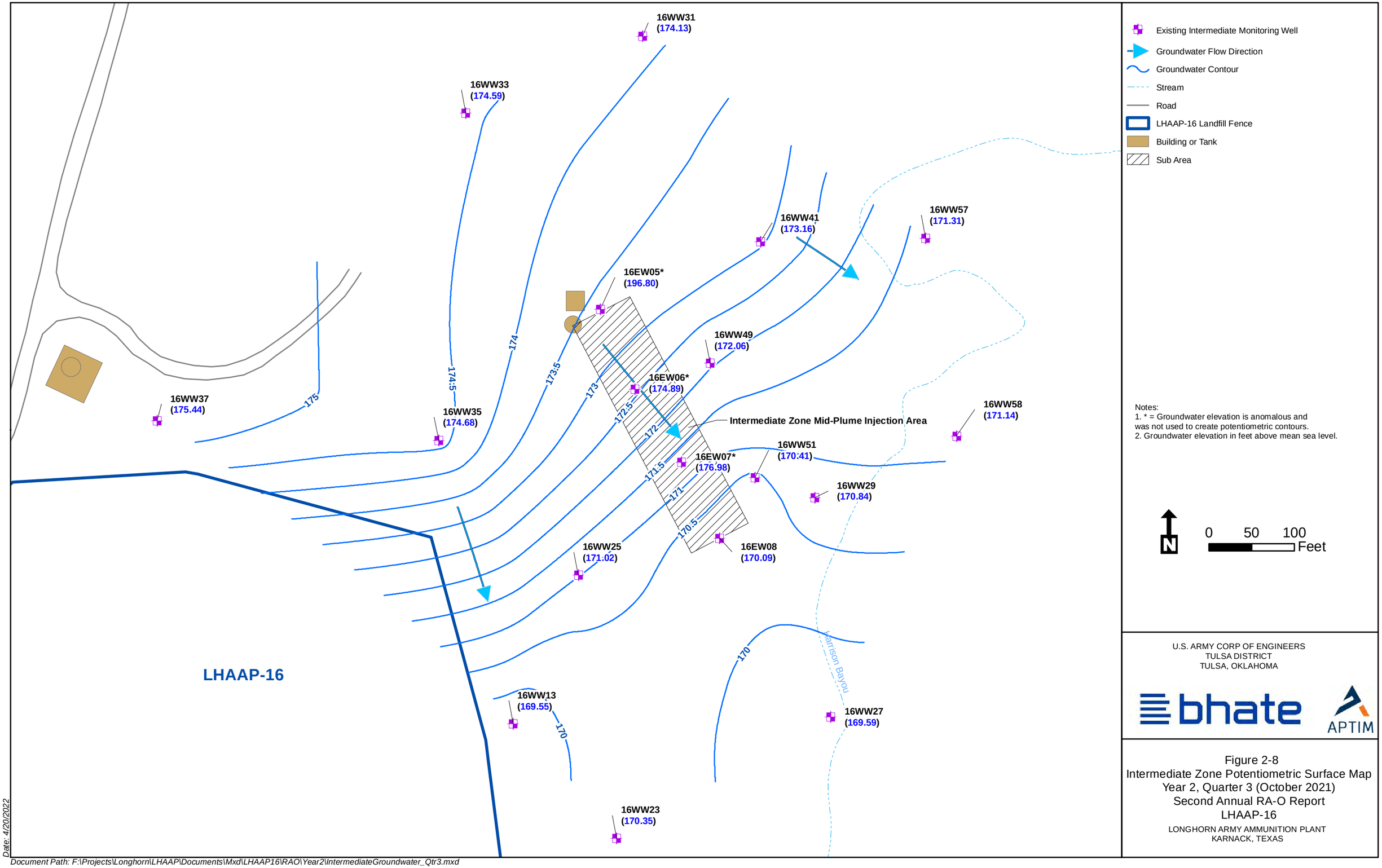
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Figure 2-7
Intermediate Zone Potentiometric Surface Map
Year 2, Quarter 2 (July 2021)
Second Annual RA-O Report
LHAAP-16
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

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Figure 2-8
Intermediate Zone Potentiometric Surface Map
Year 2, Quarter 3 (October 2021)
Second Annual RA-O Report
LHAAP-16
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 4/20/2022

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16WW31 (173.56)
16WW33 (174.04)
16WW41 (172.63)
16WW57 (171.38)
16EW05* (196.90)
16WW49 (171.98)
16EW06* (175.76)
Intermediate Zone Mid-Plume Injection Area
16WW37 (174.97)
16WW35 (174.18)
16WW58 (169.41)
16EW07* (167.08)
16WW51 (170.66)
16WW29 (171.13)
16EW08 (170.57)
16WW25 (171.33)
LHAAP-16
Harrison Bayou
16WW13 (170.44)
16WW27 (170.21)
16WW23 (170.82)
174.5
174
173.5
173
172.5
172
171.5
171
170.5
170
169.5

Existing Intermediate Monitoring Well
Groundwater Flow Direction
Groundwater Contour
Stream
Road
LHAAP-16 Landfill Fence
Building or Tank
Sub Area

Notes:
1. * = Groundwater elevation is anomalous and was not used to create potentiometric contours.
2. Groundwater elevation in feet above mean sea level.

N
0 50 100 Feet

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Figure 2-9
Intermediate Zone Potentiometric Surface Map
Year 2, Quarter 4 (January 2022)
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LHAAP-16
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 4/20/2022
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16RW01				
Date	4/14/2021	7/26/2021	10/26/2021	1/24/2022
Perchlorate	0.0618 J	0.5 U	0.2 U	0.053 J
Trichloroethene	3000	2300	2200	1200
cis-1,2-Dichloroethene	130	84	81	64
Vinyl chloride	5 U	2.5 U	2.3 J	2.5 U

16RW02				
Date	4/14/2021	7/26/2021	10/13/2021	1/24/2022
Perchlorate	0.0612 J	0.0255 J	0.2 U	0.2 U
Trichloroethene	3.1	2.1	2.7	2.7
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.8 J	0.67 J
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U

16IW09				
Date	4/22/2021	7/14/2021	10/20/2021	1/25/2022
Perchlorate	0.05 U	1 U	0.2 U	0.16 J
Trichloroethene	0.62 J	3.8	0.99 J	0.5 U
cis-1,2-Dichloroethene	3.1	4.6	3.5	2.4
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U

LHAAP-16

DPT-01
DPT-02
DPT-03
DPT-04
DPT-05
DPT-06
DPT-07
DPT-08
DPT-09
DPT-10
DPT-11
DPT-12
16RW03
DPT-13
DPT-14
DPT-15
DPT-16
DPT-17
DPT-18

16RW04				
Date	4/14/2021	7/26/2021	10/20/2021	1/24/2022
Perchlorate	0.05 U	0.5 U	0.2 U	0.2 U
Trichloroethene	1100	1200	1600	970
cis-1,2-Dichloroethene	62	80	88	66
Vinyl chloride	2.5 U	2	5 U	1.2

16WW26				
Date	4/20/2021	7/13/2021	10/14/2021	1/12/2022
Perchlorate	0.05 U	1 U	0.2 U	0.2 U
Trichloroethene	130	26	500	440
cis-1,2-Dichloroethene	8.7	3.7	36	44
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.65 J

16WW25				
Date	4/20/2021	7/13/2021	10/14/2021	1/12/2022
Perchlorate	0.25 U	1 U	0.2 U	0.2 U
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U

16RW05				
Date	4/19/2021	7/14/2021	10/18/2021	1/24/2022
Perchlorate	0.1 U	2 U	0.2 U	0.2 U
Trichloroethene	0.52 J	1.1	0.5 U	0.81 J
cis-1,2-Dichloroethene	0.5 U	0.69 J	0.5 U	0.86 J
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.9 J

16WW42				
Date	4/19/2021	7/26/2021	10/26/2021	1/27/2022
Perchlorate	0.05 U	0.05 U	0.2 U	1 U
Trichloroethene	0.97 J	1.1	180	190
cis-1,2-Dichloroethene	66	67	980	1200
Vinyl chloride	0.5 U	0.5 U	5 U	2.5 U

16WW13				
Date	4/19/2021	7/26/2021	10/26/2021	1/27/2022
Perchlorate	0.292	0.5 U	0.2 U	1 U
Trichloroethene	22	1500	2800	2300
cis-1,2-Dichloroethene	140	560	680	690
Vinyl chloride	0.87 J	9.6	10	10

N

0 20 40 Feet

Shallow Well Location
Intermediate Well Location
Groundwater Flow Direction (January 2022)
Direct Push Injection Point
Target In Situ Reaction Zone
LHAAP-16 Landfill Fence

Notes:
1. Blue Highlighting Indicates the concentration exceeds the MCL/PCL.
2. Qualifiers:
J - Estimated: The analyte was positively identified; the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U - Undetected: The analyte was analyzed for, but not detected.
3. NA - Not Analyzed
4. Monitoring wells 16WW13 and 16WW25 are shown on this map due to the lateral bounds of the treatment area; however, these are intermediate zone wells and are not being used to monitor performance of the shallow zone ISB treatment in this area.

Date: 4/20/2022

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Figure 2-10
Year 2 COC Concentrations in Groundwater
Landfill Biobarrier #1
Second Annual RA-O Report
LHAAP-16
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

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Figure 2-11
Concentration Trends, 16WW26, Landfill Biobarrier #1

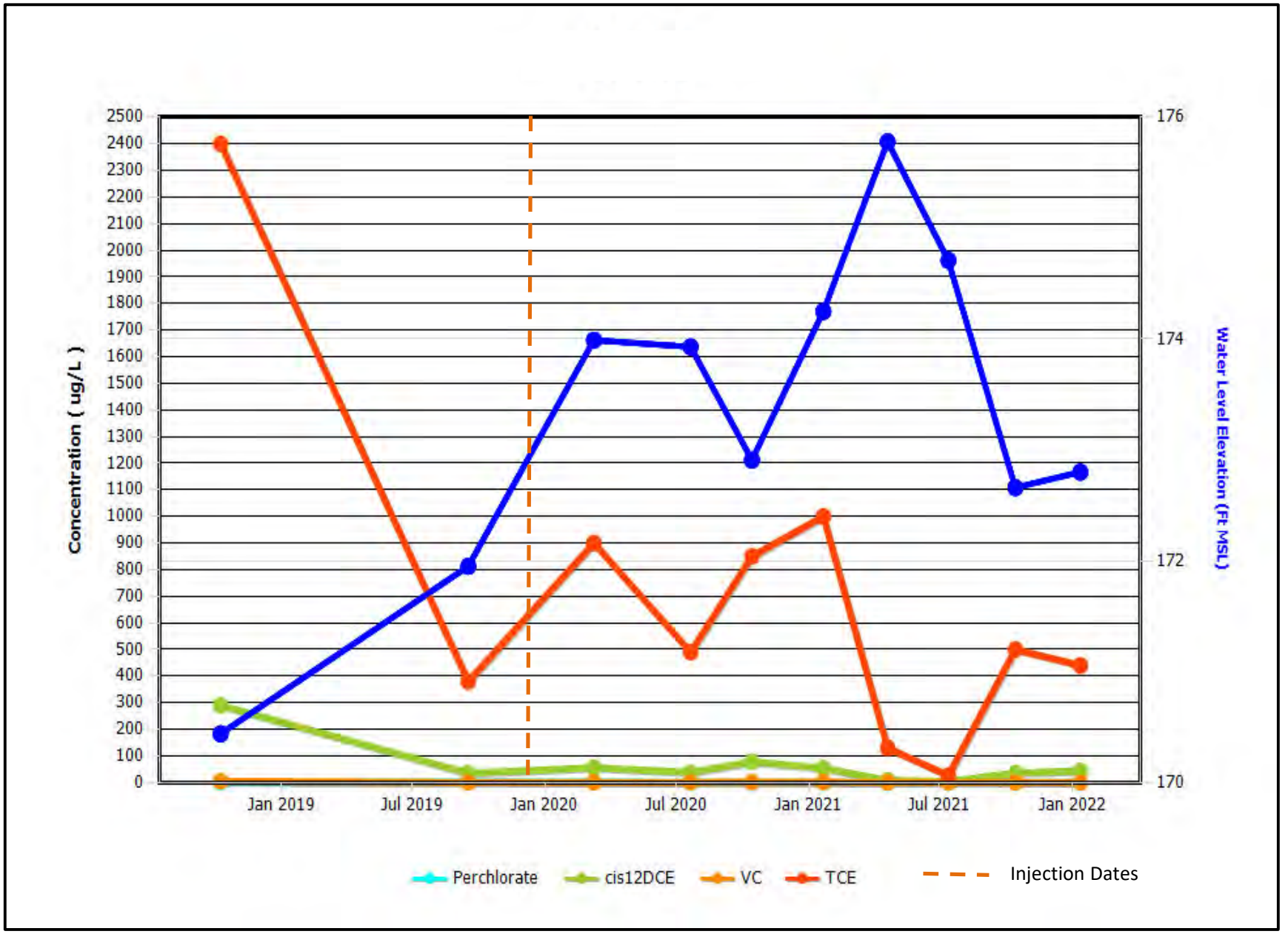
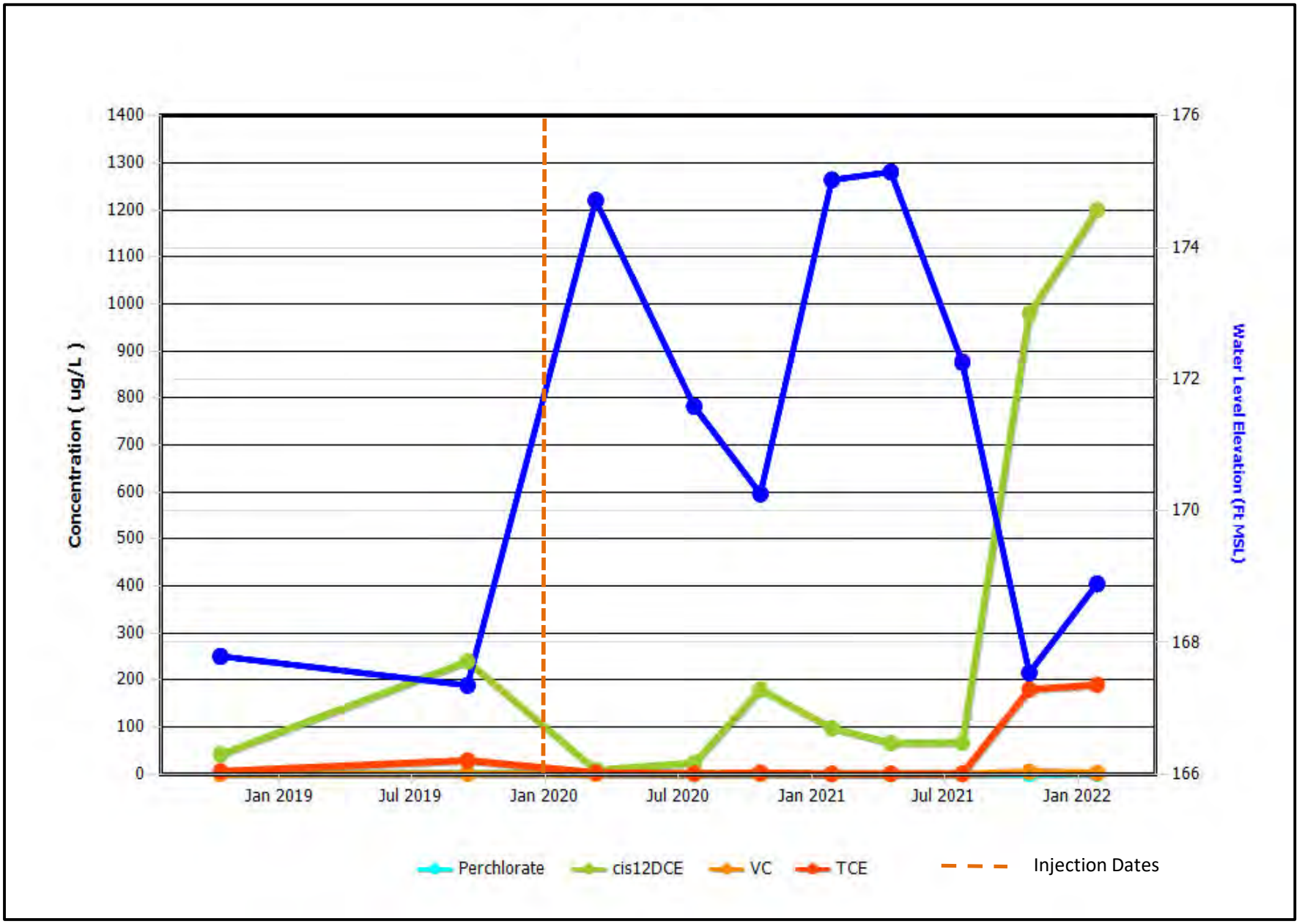


Figure 2-12
Concentration Trends, 16WW42, Landfill Biobarrier #1



16PM03				
Date	4/14/2021	7/13/2021	10/25/2021	1/24/2022
Perchlorate	193	118	220	278
Trichloroethene	8,800	8,400	6,300	6,800
cis-1,2-Dichloroethene	6,800	8,300	7,400	7,100
Vinyl chloride	220	220	120	200

16WW16				
Date	4/15/2021	7/20/2021	10/13/2021	1/11/2022
Perchlorate	288	408	555	561
Trichloroethene	28,000	30,000	34,000	29,000
cis-1,2-Dichloroethene	13,000	15,000	18,000	14,000
Vinyl chloride	260	170	200	170

16PM14				
Date	4/13/2021	7/22/2021	10/26/2021	1/24/2022
Perchlorate	0.259 J	0.5 U	0.2 U	0.2 U
Trichloroethene	4,300	3,700	2,200	2,300
cis-1,2-Dichloroethene	2,900	3,700	2,900	3,100
Vinyl chloride	110	110	56	81

16IW03				
Date	4/20/2021	7/22/2021	10/21/2021	1/27/2022
Perchlorate	0.754 J	0.5 U	0.2 U	1 U
Trichloroethene	8,900	8,100	9,000 J	5,600
cis-1,2-Dichloroethene	11,000	10,000	14,000 J	15,000
Vinyl chloride	3,700	2,600	2,500 J	3,000 J

16PM06				
Date	4/13/2021	7/13/2021	10/26/2021	1/24/2022
Perchlorate	0.5 U	0.0474 J	0.2 U	0.2 U
Trichloroethene	77,000	57,000	19,000	28,000
cis-1,2-Dichloroethene	42,000	38,000	11,000	17,000
Vinyl chloride	1,800	930	390	350

16WW35				
Date	4/13/2021	7/14/2021	10/13/2021	1/11/2022
Perchlorate	367	352	366	342
Trichloroethene	9,300	8,100	9,700	11,000
cis-1,2-Dichloroethene	2,100	2,000	5,100	4,400
Vinyl chloride	90	74	39	58

16WW36				
Date	4/13/2021	7/14/2021	10/13/2021	1/11/2022
Perchlorate	1.26	0.438 J	0.291 J	0.098 J
Trichloroethene	10,000	15,000	8,100	8,100
cis-1,2-Dichloroethene	9,000	17,000	8,700	6,700
Vinyl chloride	78	140	43	49

16PM02				
Date	4/14/2021	7/13/2021	10/25/2021	1/24/2022
Perchlorate	0.0372 J	2.5 U	0.2 U	0.2 U
Trichloroethene	15,000	17,000	16,000	31,000
cis-1,2-Dichloroethene	2,200	3,400	2,500	4,500
Vinyl chloride	40	43	35	99

16PM09				
Date	4/13/2021	7/22/2021	10/26/2021	1/24/2022
Perchlorate	0.0355 J	0.05 U	0.2 U	0.2 U
Trichloroethene	640	370	770	1,300
cis-1,2-Dichloroethene	210	200	520	950
Vinyl chloride	10	9.1	23	84

16EW11
16IW01
16IW02
16EW12
16EW12B
16PM08
16PM11
16PM04
16EW10
16PM07-S
16PM13-S
16PM07-D
16PM13-D
16PM01
16EW13
16PM10-D
16PM10-S
16IW05
16IW06
16EW09
16EW14B
16EW14
16IW07
16IW08
16PM05
16PM12
16EW15

LHAAP-16

N
0 15 30 Feet

Shallow Extraction, Injection, or Monitoring Well
Intermediate Well Location
Groundwater Flow Direction (January 2022)
Target In Situ Reaction Zone
LHAAP-16 Landfill Fence

Notes:
1. Blue Highlighting Indicates the concentration exceeds the MCL/PCL.
2. Qualifiers:
J - Concentration shown is estimated
U - Undetected: The analyte was analyzed for, but not detected.
3. NA - Not Analyzed
4. Monitoring well 16WW35 is shown on this map due to the lateral bounds of the treatment area; however, this is an intermediate zone well and is not being used to monitor performance of the shallow zone ISB treatment in this area.

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Figure 2-13
Year 2 COC Concentrations in Groundwater
Landfill Biobarrier #2
Second Annual RA-O Report
LHAAP-16
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 1/24/2023

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Figure 2-14
Concentration Trends, 16PM06, Landfill Biobarrier #2

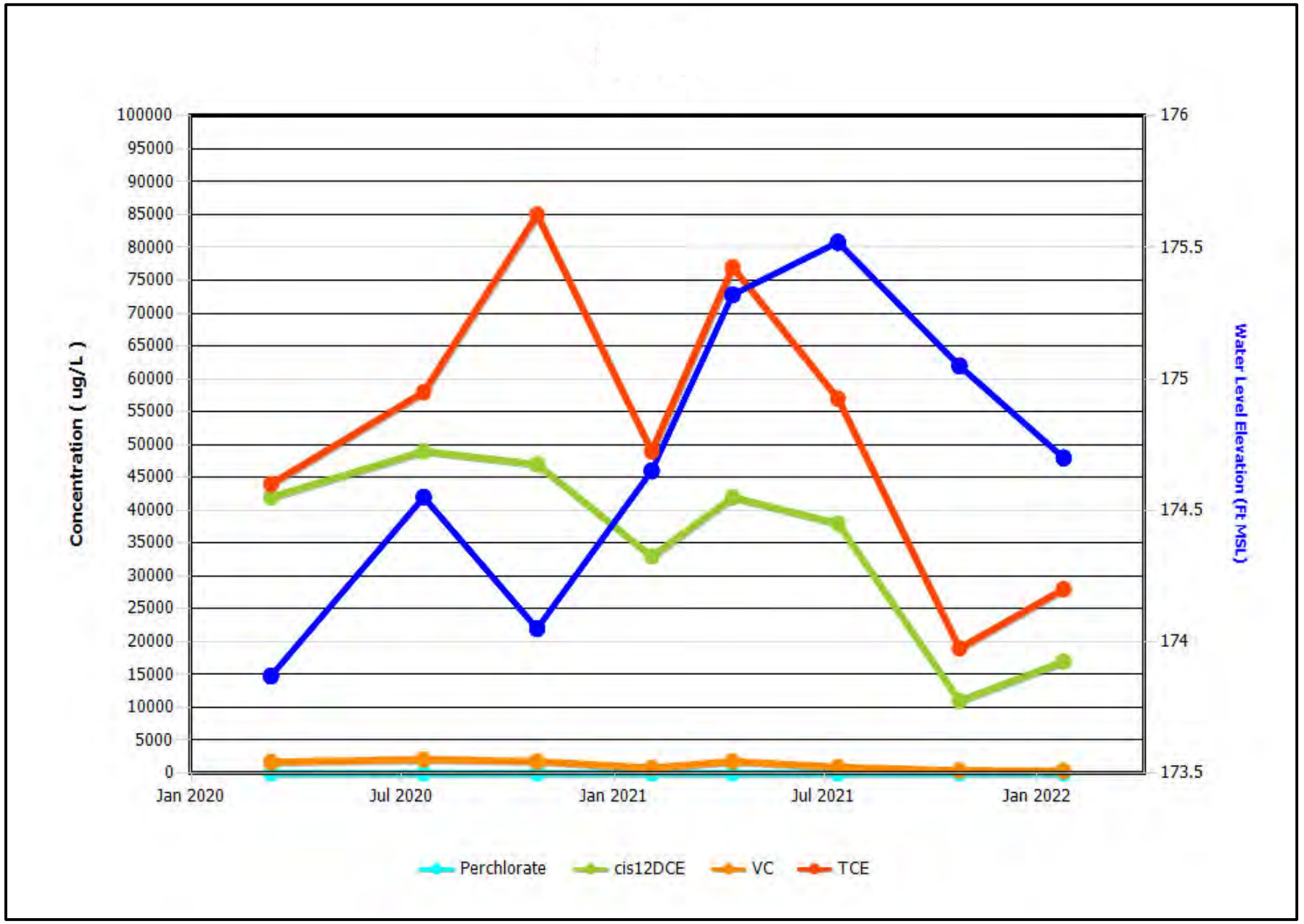
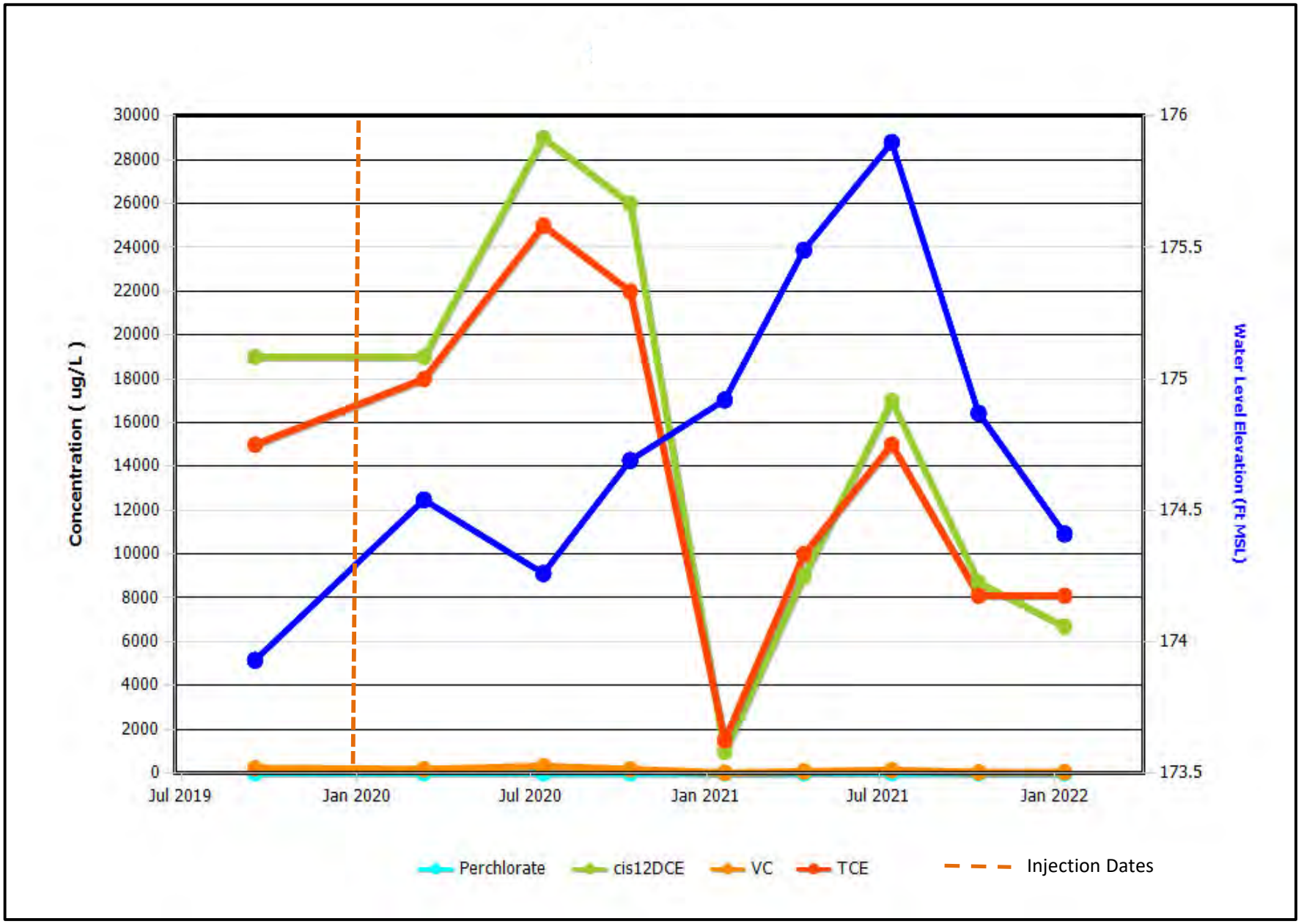


Figure 2-15
Concentration Trends, 16WW36, Landfill Biobarrier #2



16RW06				
Date	4/19/2021	7/27/2021	10/25/2021	1/25/2022
Perchlorate	0.5 U	1 U	0.2 U	0.089 J
Trichloroethene	60	64 J	34	37
cis-1,2-Dichloroethene	1.7	4.4 J	6.8	5.3
Vinyl chloride	0.5 U	0.5 UJ	0.5 U	1.2

16WW14				
Date	4/12/2021	7/12/2021	10/25/2021	1/10/2022
Perchlorate	0.05 U	0.21	0.2 U	0.21
Trichloroethene	17	8.4	12	17
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.63 J
Vinyl chloride	0.05 U	0.05 U	0.05 U	0.05 U

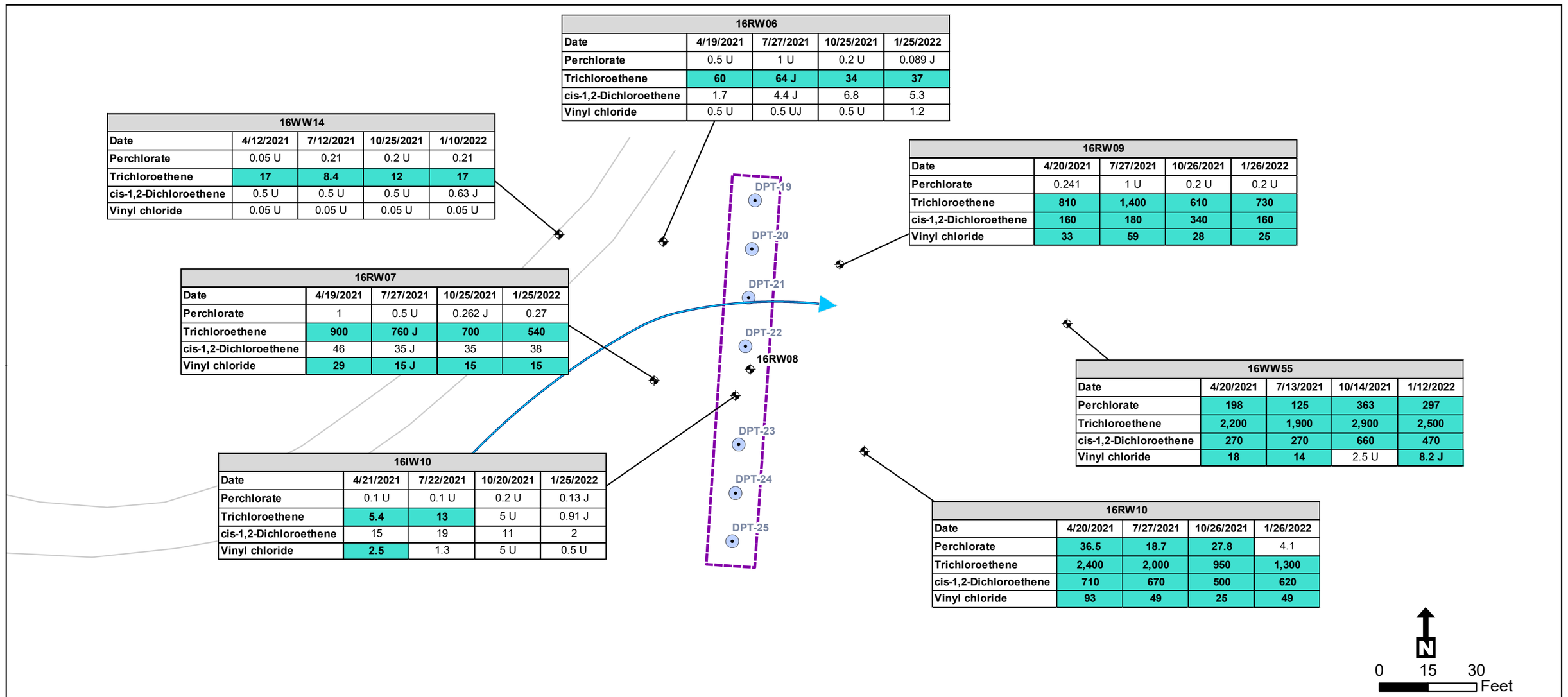
16RW09				
Date	4/20/2021	7/27/2021	10/26/2021	1/26/2022
Perchlorate	0.241	1 U	0.2 U	0.2 U
Trichloroethene	810	1,400	610	730
cis-1,2-Dichloroethene	160	180	340	160
Vinyl chloride	33	59	28	25

16RW07				
Date	4/19/2021	7/27/2021	10/25/2021	1/25/2022
Perchlorate	1	0.5 U	0.262 J	0.27
Trichloroethene	900	760 J	700	540
cis-1,2-Dichloroethene	46	35 J	35	38
Vinyl chloride	29	15 J	15	15

16WW55				
Date	4/20/2021	7/13/2021	10/14/2021	1/12/2022
Perchlorate	198	125	363	297
Trichloroethene	2,200	1,900	2,900	2,500
cis-1,2-Dichloroethene	270	270	660	470
Vinyl chloride	18	14	2.5 U	8.2 J

16IW10				
Date	4/21/2021	7/22/2021	10/20/2021	1/25/2022
Perchlorate	0.1 U	0.1 U	0.2 U	0.13 J
Trichloroethene	5.4	13	5 U	0.91 J
cis-1,2-Dichloroethene	15	19	11	2
Vinyl chloride	2.5	1.3	5 U	0.5 U

16RW10				
Date	4/20/2021	7/27/2021	10/26/2021	1/26/2022
Perchlorate	36.5	18.7	27.8	4.1
Trichloroethene	2,400	2,000	950	1,300
cis-1,2-Dichloroethene	710	670	500	620
Vinyl chloride	93	49	25	49



Shallow Zone Injection, Monitoring, or Recovery Well

Direct Push Injection Point

Groundwater Flow Direction (January 2022)

Target In Situ Reaction Zone

Notes:
1. Blue Highlighting Indicates the concentration exceeds the MCL/PCL.
2. Qualifiers:
J - Estimated: The analyte was positively identified; the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U - Undetected: The analyte was analyzed for, but not detected.
3. NA - Not Analyzed

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Figure 2-16
Year 2 COC Concentrations in Groundwater
Landfill Biobarrier #3
Second Annual RA-O Report
LHAAP-16

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

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Figure 2-17
Concentration Trends, 16IW10, Landfill Biobarrier #3

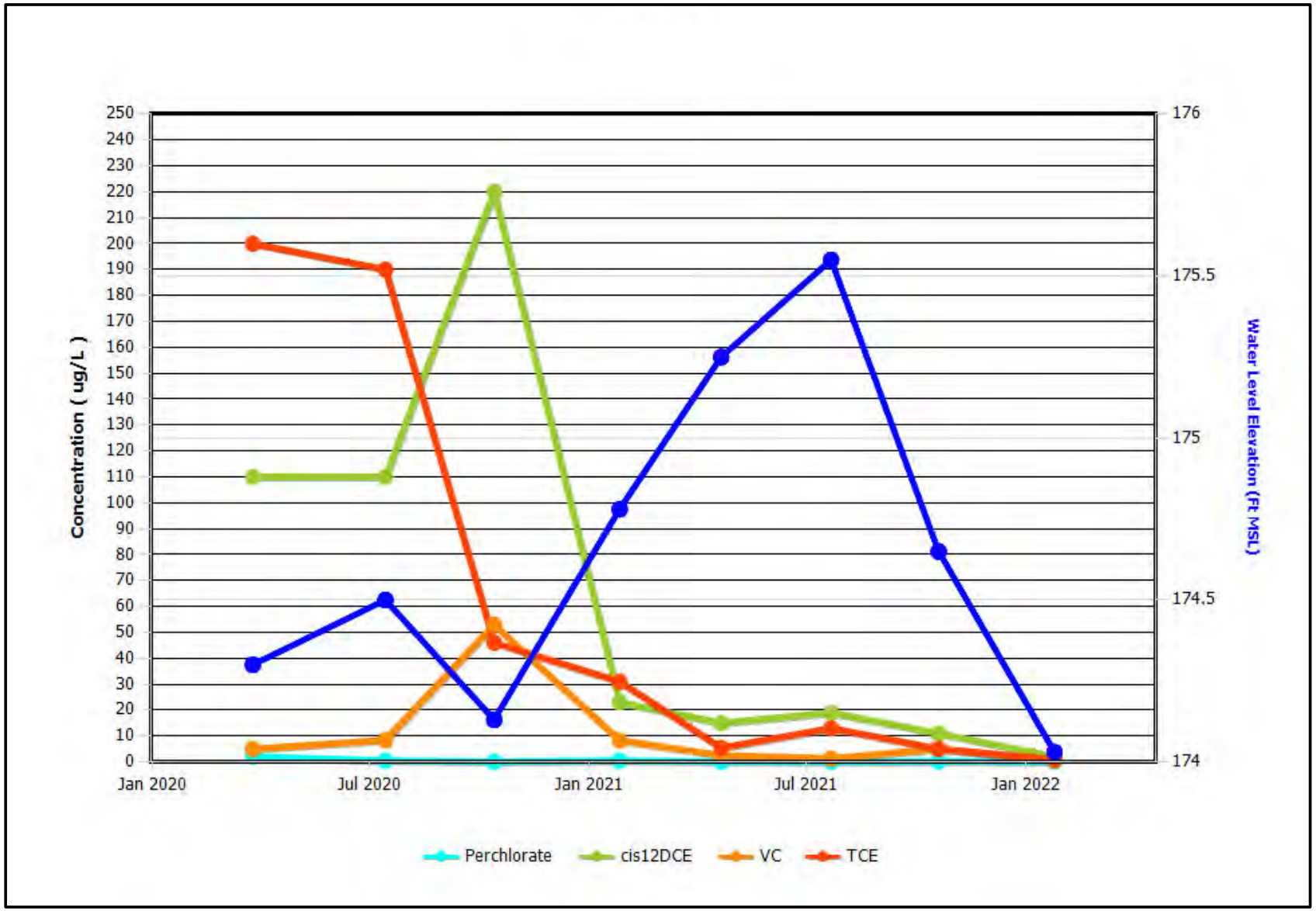
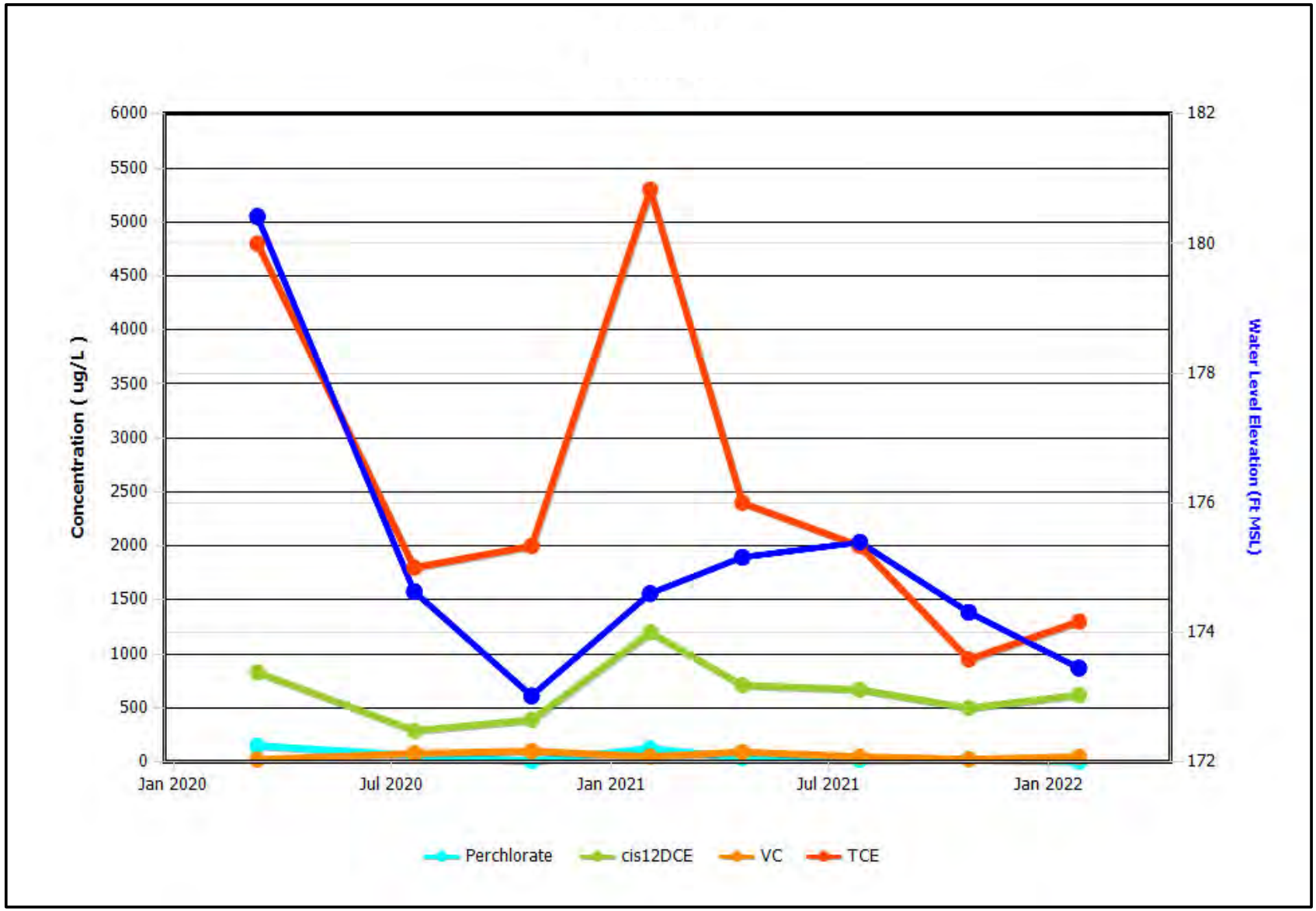


Figure 2-18
Concentration Trends, 16RW10, Landfill Biobarrier #3



16WW22				
Date	4/15/2021	7/20/2021	10/19/2021	1/11/2022
Perchlorate	0.471	0.148	0.486	0.4
Trichloroethene	12	13	7.6	13
cis-1,2-Dichloroethene	2	2.2	2.5	2.9
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U

16WW56				
Date	4/15/2021	7/20/2021	10/19/2021	1/11/2022
Perchlorate	0.0783 J	0.05 U	0.2 U	0.13 J
Trichloroethene	14	12	6.2	7
cis-1,2-Dichloroethene	1.2	1.5	0.76 J	0.67 J
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U

16WW41				
Date	4/15/2021	7/20/2021	10/19/2021	1/13/2022
Perchlorate	212	107	66.5	59.1
Trichloroethene	6,200	5,400	1,900	3,800
cis-1,2-Dichloroethene	2,600	2,300	920	1,600
Vinyl chloride	330	270	59	210

16RW11				
Date	4/21/2021	7/22/2021	10/21/2021	1/26/2022
Perchlorate	0.0617 J	0.5 U	0.2 U	0.2 U
Trichloroethene	2	2.3	1.3 J	1.1
cis-1,2-Dichloroethene	0.85 J	1.1	0.5 UJ	0.5 U
Vinyl chloride	0.5 U	0.77 J	0.5 UJ	0.5 U

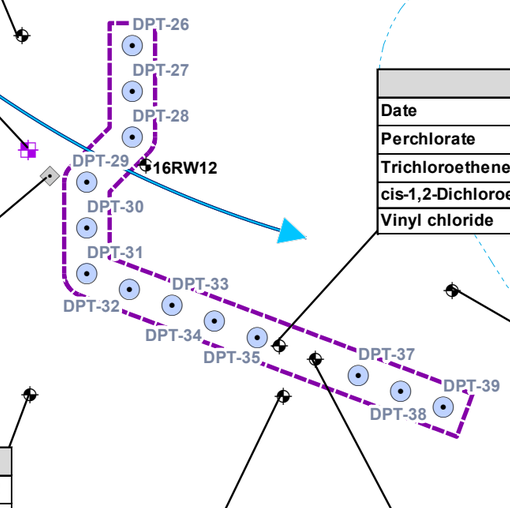
16WW21				
Date	4/15/2021	7/20/2021	10/19/2021	1/13/2022
Perchlorate	0.05 U	0.5 U	0.2 U	0.2 U
Trichloroethene	1.1	1	0.56 J	0.95 J
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U

16WW40				
Date	4/21/2021	7/27/2021	10/21/2021	1/26/2022
Perchlorate	0.88	0.693 J	0.622	0.55
Trichloroethene	1,000	1,900	1,000 J	540
cis-1,2-Dichloroethene	210	190	170 J	120
Vinyl chloride	5.4	9	5 UJ	2.9

16WW39				
Date	4/15/2021	7/28/2021	10/25/2021	1/11/2022
Perchlorate	7.87	6.76	9.07	4
Trichloroethene	330	230	210 J	120
cis-1,2-Dichloroethene	39	29	28	10
Vinyl chloride	1.1	0.97 J	1.8	0.73 J

16WW12				
Date	4/21/2021	7/28/2021	10/21/2021	1/26/2022
Perchlorate	42.1	16	23.2	30.5
Trichloroethene	2,100	1,700	1,000 J	1,100
cis-1,2-Dichloroethene	76	64	69 J	77
Vinyl chloride	8.2 J	5.5	4.6 J	5 J

16IW20				
Date	4/21/2021	7/22/2021	10/21/2021	1/25/2022
Perchlorate	0.05 U	0.5 U	0.2 U	0.2 U
Trichloroethene	5.7	7.6	1.2 J	0.96 J
cis-1,2-Dichloroethene	30	7.2	1.9 J	1.1
Vinyl chloride	9.1	10	3.2 J	4.6



N

0 25 50 Feet

Shallow Well

Intermediate Well Location

Upper Deep Well Location

Direct Push Injection Point

Groundwater Flow Direction (January 2022)

Target In Situ Reaction Zone Based on Design Radius of Influence

Notes:
1. Blue Highlighting Indicates the concentration exceeds the MCL/PCL.
2. Qualifiers:
J - Estimated: The analyte was positively identified; the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U - Undetected: The analyte was analyzed for, but not detected.
3. Monitoring wells 16WW21 and 16WW41 are shown on this map due to the lateral bounds of the treatment area; however, these are intermediate zone/upper deep zone wells and are not being used to monitor performance of the shallow zone ISB treatment in this area.

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Figure 2-19
Year 2 COC Concentrations in Groundwater
Bayou Biobarrier
Second Annual RA-O Report
LHAAP-16
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 4/20/2022

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP16\RAO\Year2\Landfill_Biobarrier_Bayou_Year2RAO.mxd

Figure 2-20
Concentration Trends, 16IW20, Bayou Biobarrier

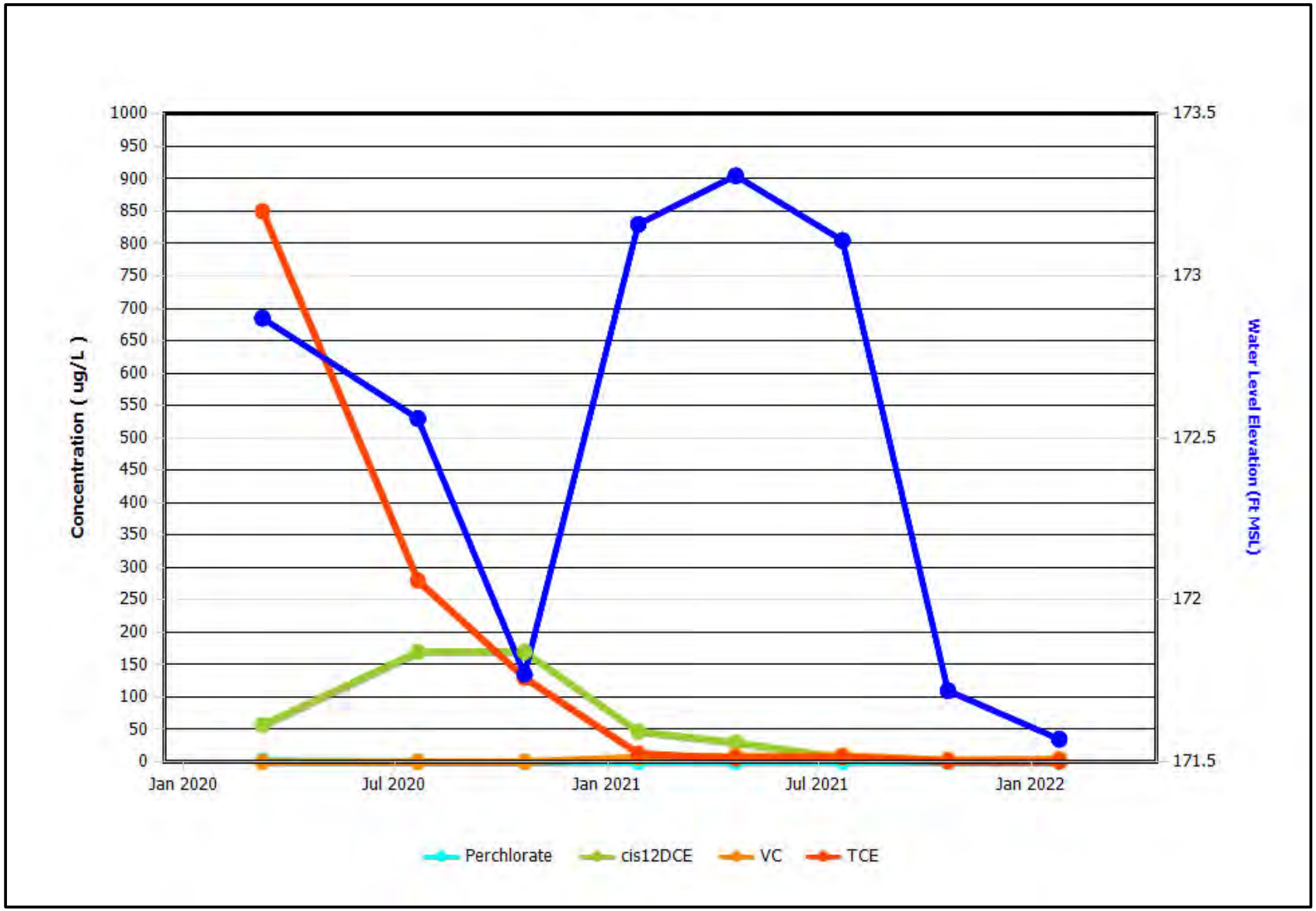


Figure 2-21
Concentration Trends, 16RW11, Bayou Biobarrier

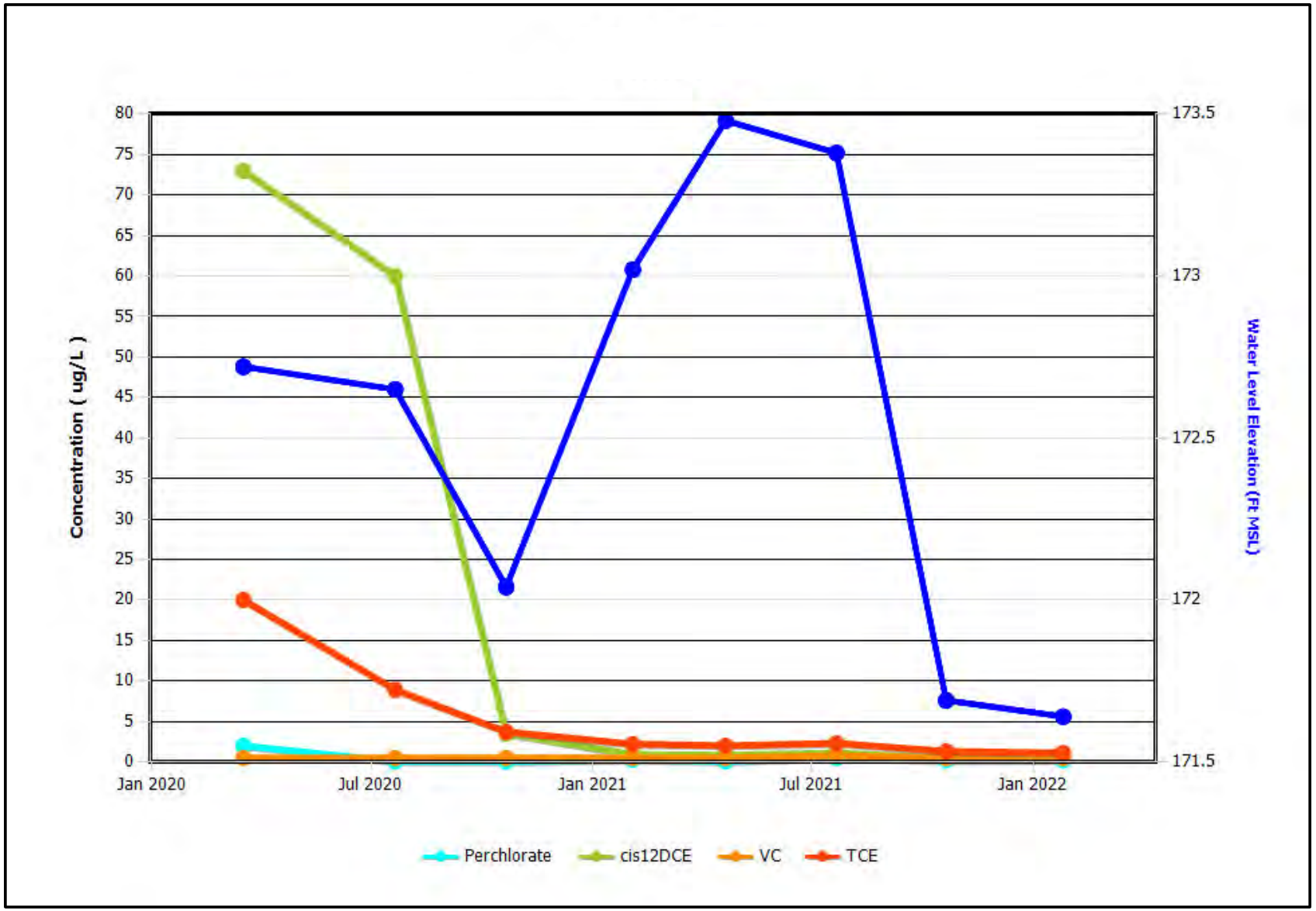
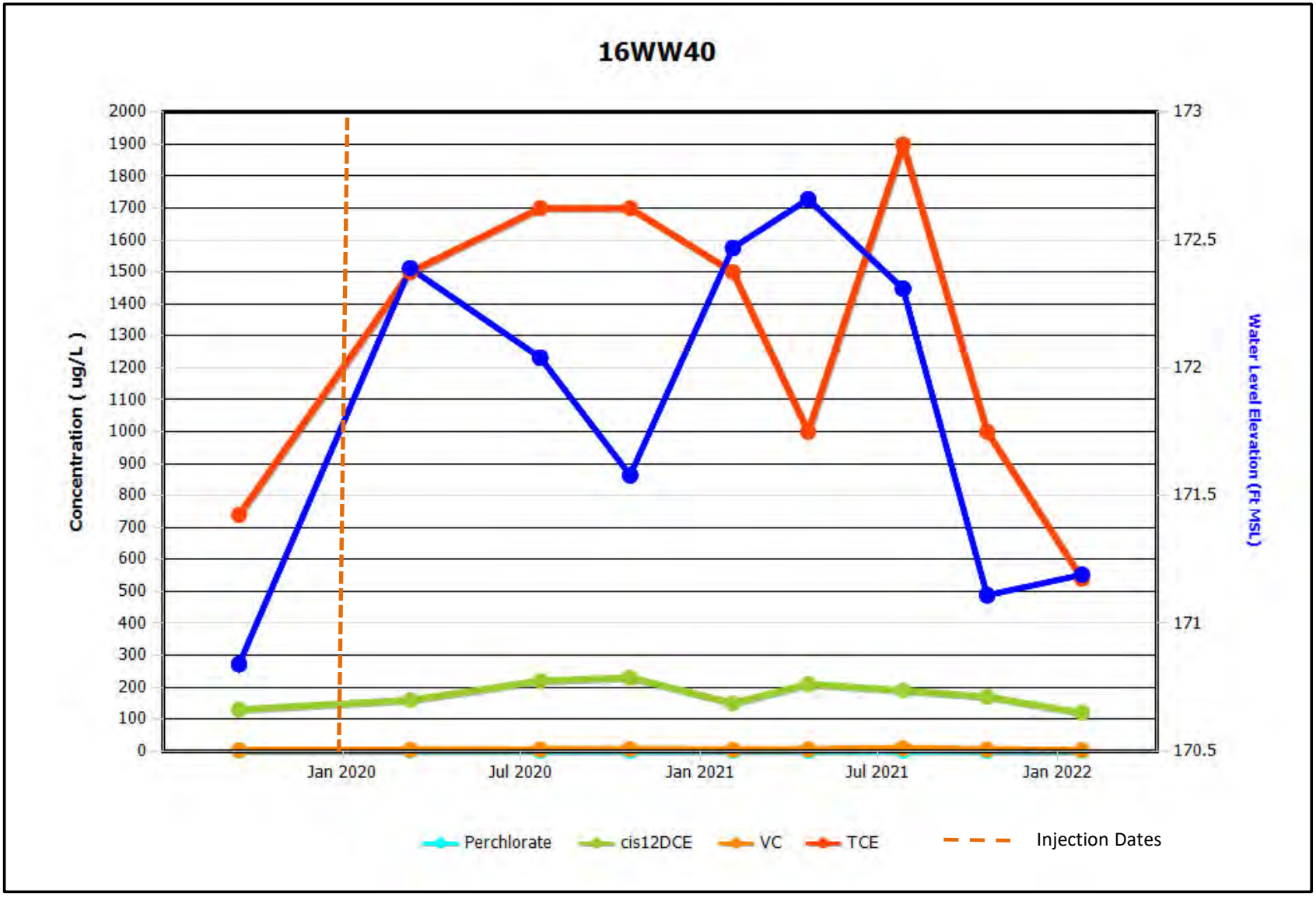


Figure 2-22
Concentration Trends, 16WW40, Bayou Biobarrier



16EW01				
Date	4/21/2021	7/13/2021	10/20/2021	1/13/2022
Perchlorate	41.9	29	40.3	61
Trichloroethene	3,500	990	970	1,800
cis-1,2-Dichloroethene	6,000	2,000	3,400	3,600
Vinyl chloride	720	100	180	260

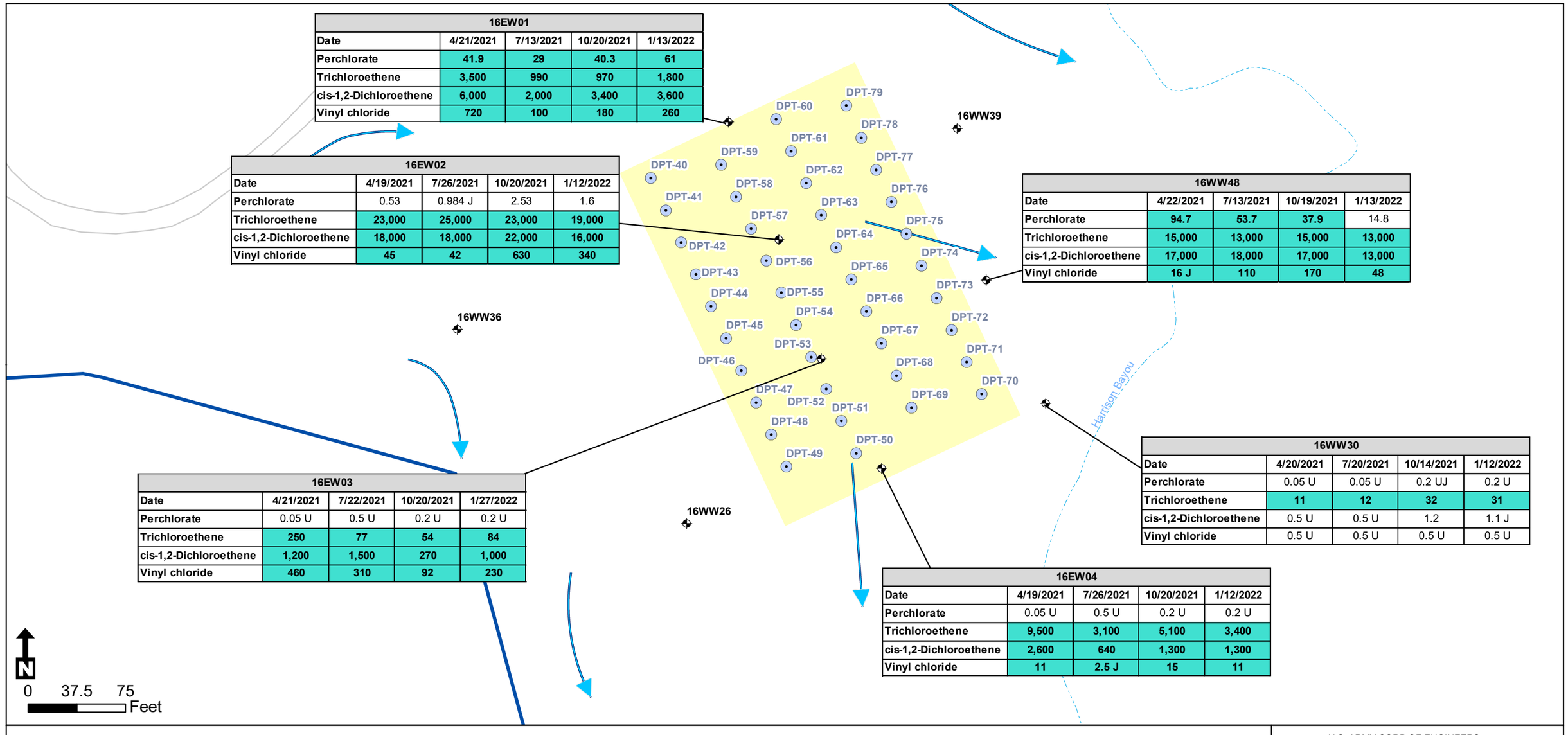
16EW02				
Date	4/19/2021	7/26/2021	10/20/2021	1/12/2022
Perchlorate	0.53	0.984 J	2.53	1.6
Trichloroethene	23,000	25,000	23,000	19,000
cis-1,2-Dichloroethene	18,000	18,000	22,000	16,000
Vinyl chloride	45	42	630	340

16WW48				
Date	4/22/2021	7/13/2021	10/19/2021	1/13/2022
Perchlorate	94.7	53.7	37.9	14.8
Trichloroethene	15,000	13,000	15,000	13,000
cis-1,2-Dichloroethene	17,000	18,000	17,000	13,000
Vinyl chloride	16 J	110	170	48

16WW30				
Date	4/20/2021	7/20/2021	10/14/2021	1/12/2022
Perchlorate	0.05 U	0.05 U	0.2 UJ	0.2 U
Trichloroethene	11	12	32	31
cis-1,2-Dichloroethene	0.5 U	0.5 U	1.2	1.1 J
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U

16EW03				
Date	4/21/2021	7/22/2021	10/20/2021	1/27/2022
Perchlorate	0.05 U	0.5 U	0.2 U	0.2 U
Trichloroethene	250	77	54	84
cis-1,2-Dichloroethene	1,200	1,500	270	1,000
Vinyl chloride	460	310	92	230

16EW04				
Date	4/19/2021	7/26/2021	10/20/2021	1/12/2022
Perchlorate	0.05 U	0.5 U	0.2 U	0.2 U
Trichloroethene	9,500	3,100	5,100	3,400
cis-1,2-Dichloroethene	2,600	640	1,300	1,300
Vinyl chloride	11	2.5 J	15	11



- Shallow Zone Extraction or Monitoring Well
- Direct Push Injection Point
- Groundwater Flow Direction (January 2022)
- Stream
- Shallow In Situ Bioremediation Area
- LHAAP-16 Landfill Fence

Notes:
1. Blue Highlighting Indicates the concentration exceeds the MCL/PCL.
2. Qualifiers:
J- - The analyte was positively identified; the associated numerical value is its approximate concentration with a low bias in the sample.
U - Undetected: The analyte was analyzed for, but not detected.
3. Monitoring wells 16WW36, 16WW26, and 16WW39 are not part of the monitoring network for the Mid-Plume Area, but are shown on this map due to their proximity to the Mid-Plume Treatment Area.

Date: 4/21/2022

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Figure 2-23

Year 2 COC Concentrations in Groundwater
Mid-Plume Area, Shallow Zone
Second Annual RA-O Report
LHAAP-16

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

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Figure 2-24
Concentration Trends,16EW02, Mid-Plume Area, Shallow Zone

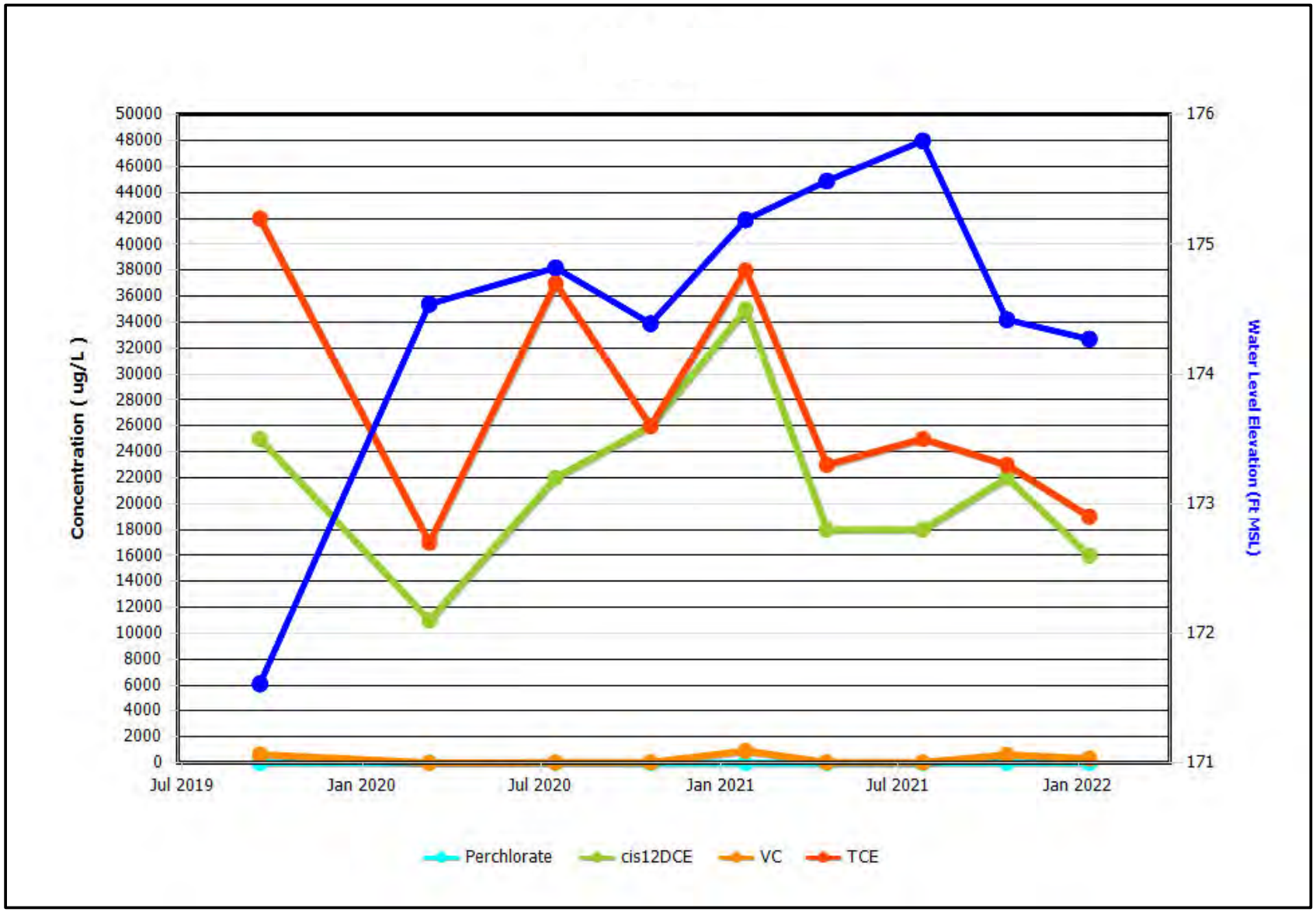


Figure 2-25
Concentration Trends, 16WW30, Mid-Plume Area, Shallow Zone

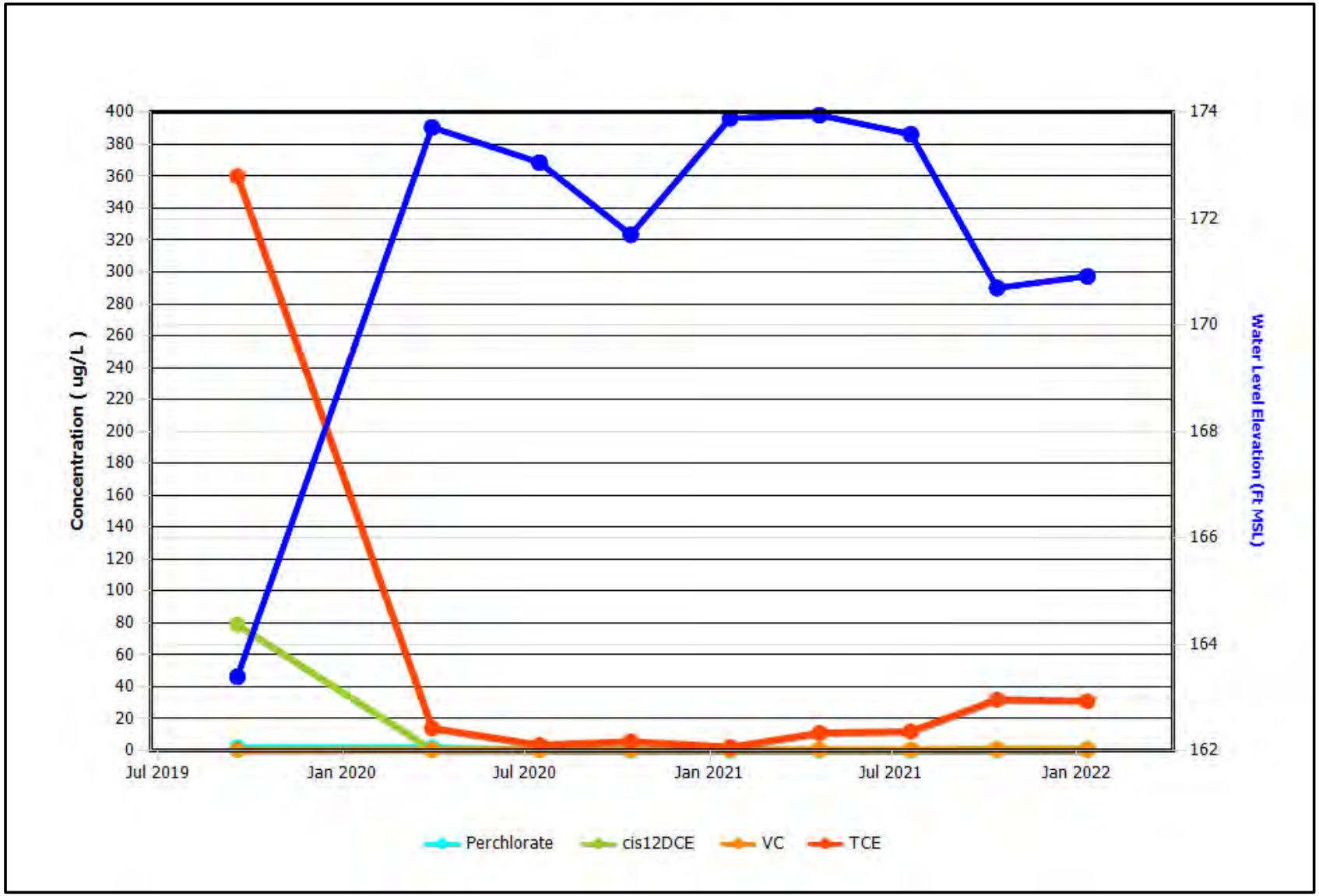
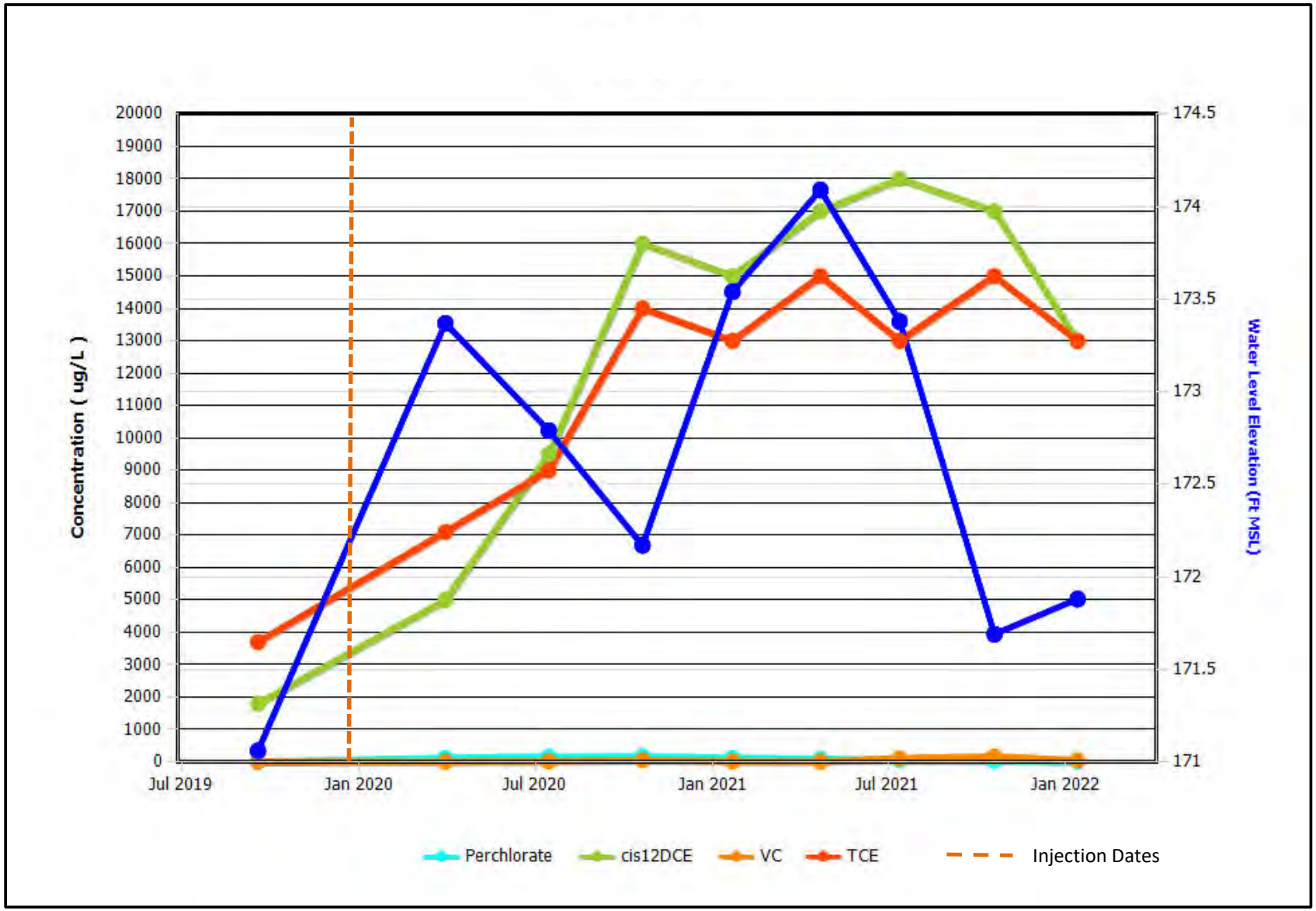


Figure 2-26
Concentration Trends, 16WW48, Mid-Plume Area, Shallow Zone



16EW05[3]		
Date	10/21/2021	1/27/2022
Perchlorate	0.164 J	0.16 J
Trichloroethene	5000 UJ	2500 U
cis-1,2-Dichloroethene	5000 UJ	2500 U
Vinyl chloride	5000 UJ	2500 U

16WW49				
Date	4/22/2021	7/28/2021	10/19/2021	1/13/2022
Perchlorate	0.05 U	0.0291 J	0.2 U	0.2 U
Trichloroethene	11	19	30	46
cis-1,2-Dichloroethene	100	77	72	60
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U

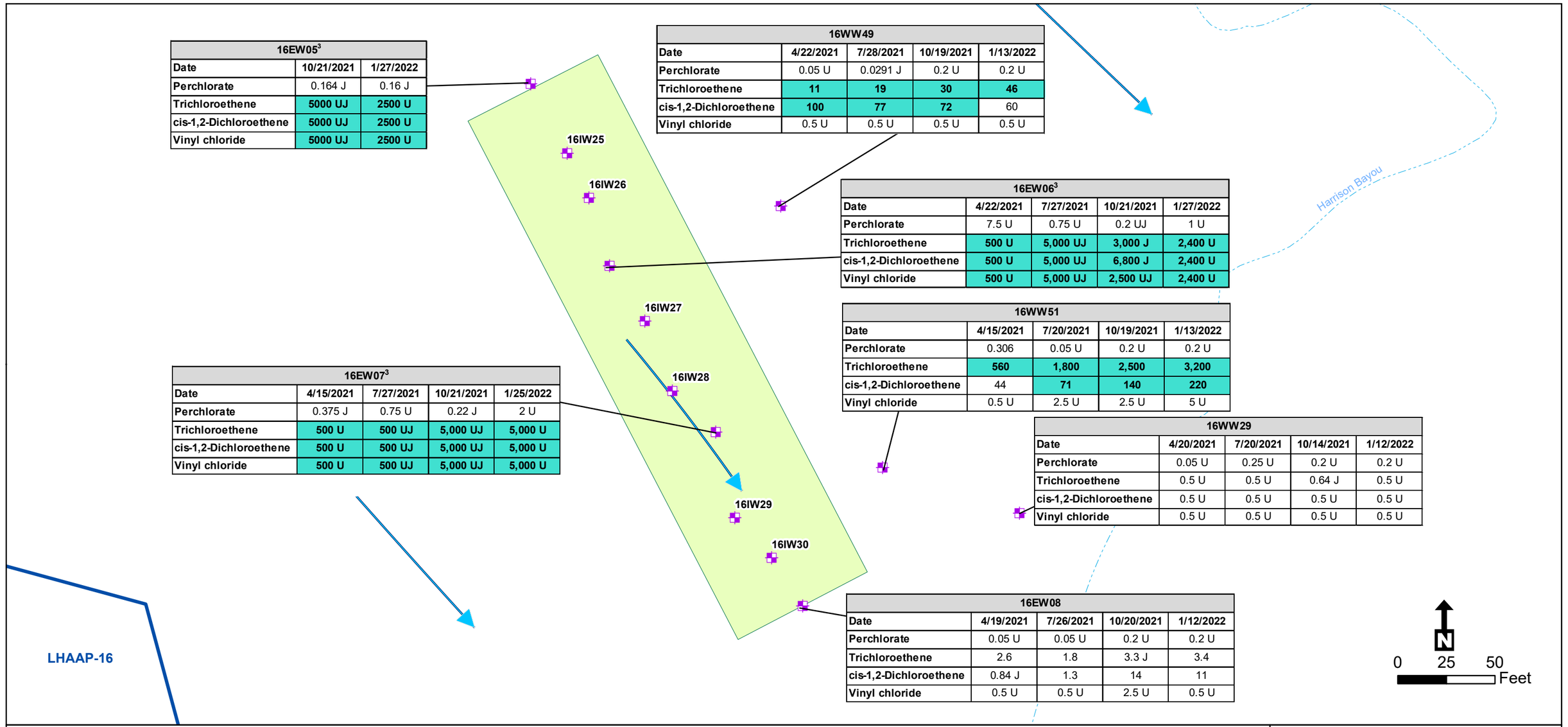
16EW06[3]				
Date	4/22/2021	7/27/2021	10/21/2021	1/27/2022
Perchlorate	7.5 U	0.75 U	0.2 UJ	1 U
Trichloroethene	500 U	5,000 UJ	3,000 J	2,400 U
cis-1,2-Dichloroethene	500 U	5,000 UJ	6,800 J	2,400 U
Vinyl chloride	500 U	5,000 UJ	2,500 UJ	2,400 U

16WW51				
Date	4/15/2021	7/20/2021	10/19/2021	1/13/2022
Perchlorate	0.306	0.05 U	0.2 U	0.2 U
Trichloroethene	560	1,800	2,500	3,200
cis-1,2-Dichloroethene	44	71	140	220
Vinyl chloride	0.5 U	2.5 U	2.5 U	5 U

16EW07[3]				
Date	4/15/2021	7/27/2021	10/21/2021	1/25/2022
Perchlorate	0.375 J	0.75 U	0.22 J	2 U
Trichloroethene	500 U	500 UJ	5,000 UJ	5,000 U
cis-1,2-Dichloroethene	500 U	500 UJ	5,000 UJ	5,000 U
Vinyl chloride	500 U	500 UJ	5,000 UJ	5,000 U

16WW29				
Date	4/20/2021	7/20/2021	10/14/2021	1/12/2022
Perchlorate	0.05 U	0.25 U	0.2 U	0.2 U
Trichloroethene	0.5 U	0.5 U	0.64 J	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U

16EW08				
Date	4/19/2021	7/26/2021	10/20/2021	1/12/2022
Perchlorate	0.05 U	0.05 U	0.2 U	0.2 U
Trichloroethene	2.6	1.8	3.3 J	3.4
cis-1,2-Dichloroethene	0.84 J	1.3	14	11
Vinyl chloride	0.5 U	0.5 U	2.5 U	0.5 U



Intermediate Zone Injection, Extraction, or Monitoring Well

Groundwater Flow Direction (January 2022)

Stream

Intermediate Groundwater Zone In Situ Bioremediation Area

LHAAP-16 Landfill Fence

Notes:
1. Blue Highlighting Indicates the concentration exceeds the MCL/PCL.
2. Qualifiers:
   J - Concentration shown is estimated.
   U - Undetected: The analyte was analyzed for, but not detected.
3. Analytical detecton limits for 16EW05, 16EW06, and 16EW07 were significantly higher than the MCL due to the dilution of the samples that was necessary because of the presence of residual emulsified vegetable oil in the wells.

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Figure 2-27

Year 2 COC Concentrations in Groundwater
Mid-Plume Area, Intermediate Zone
Second Annual RA-O Report
LHAAP-16

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 2/8/2023

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Figure 2-28
Concentration Trends, 16WW49, Mid-Plume Area, Intermediate Zone

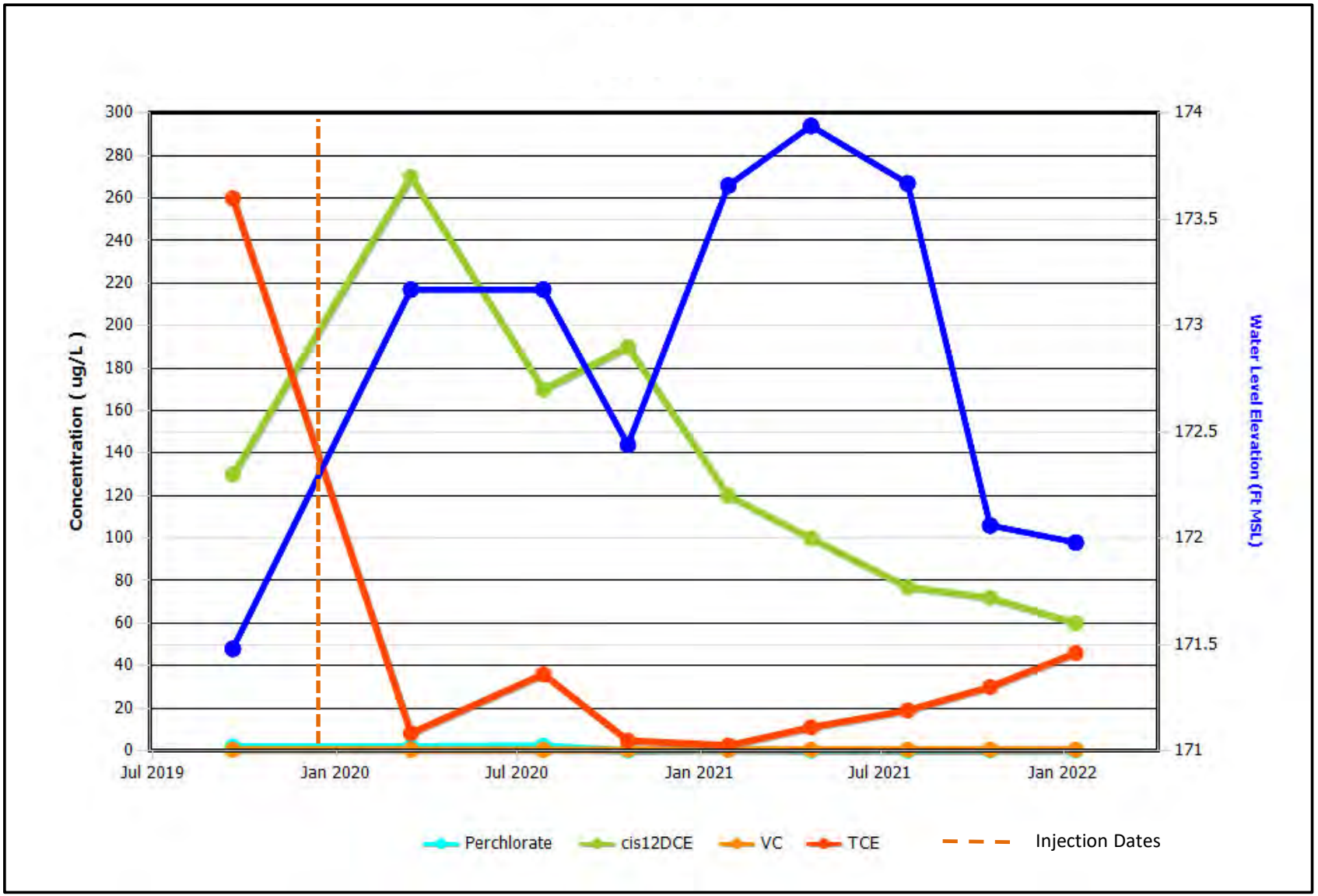
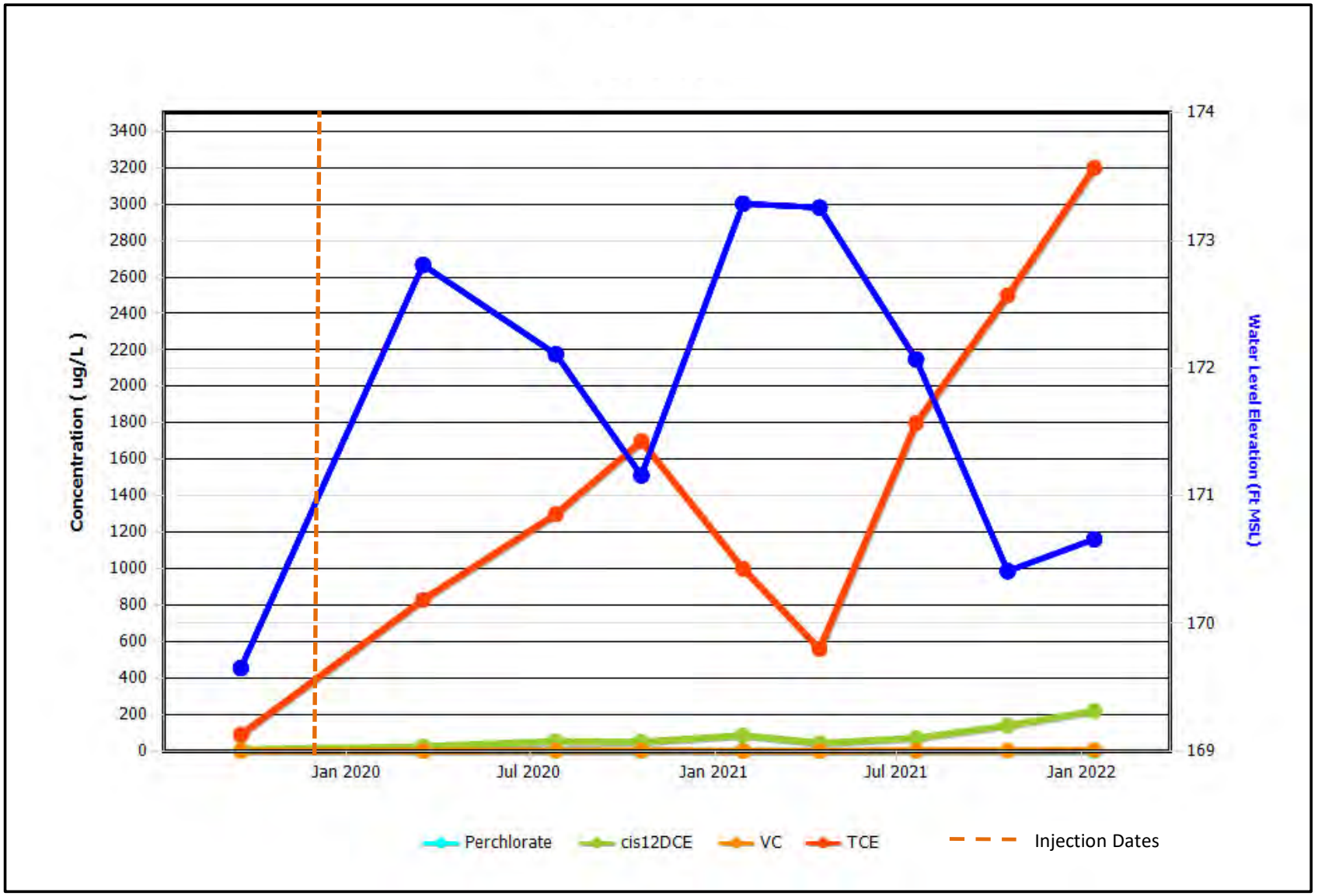


Figure 2-29
Concentration Trends, 16WW51, Mid-Plume Area, Intermediate Zone



16WW31				
Date	4/12/2021	7/12/2021	10/18/2021	1/11/2022
Perchlorate	0.05 U	2.5 U	0.2 U	0.2 U
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U

16WW32				
Date	4/12/2021	7/12/2021	10/18/2021	1/10/2022
Perchlorate	0.05 U	5 U	0.2 U	0.089 J
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U

16WW33				
Date	4/12/2021	7/12/2021	10/18/2021	1/10/2022
Perchlorate	0.05 U	5 U	0.2 U	0.12 J
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U

16WW46				
Date	4/12/2021	7/27/2021	10/18/2021	1/11/2022
Perchlorate	0.5 U	1 U	0.2 U	0.098 J
Trichloroethene	0.5 U	0.63 J	0.5 U	0.82 J
cis-1,2-Dichloroethene	0.5 U	0.5 UJ	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 UJ	0.5 U	0.5 U

16WW34				
Date	4/12/2021	7/12/2021	10/18/2021	1/10/2022
Perchlorate	0.05 U	2.5 U	0.2 U	0.14 J
Trichloroethene	0.5 U	0.5 U	0.5 U	0.51 J
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U

16WW57				
Date	4/13/2021	7/14/2021	10/13/2021	1/13/2022
Perchlorate	0.171 J	0.5 U	0.2 UJ	0.099 J
Trichloroethene	**57**	**60**	**75**	**85**
cis-1,2-Dichloroethene	0.5 U	0.8 J	0.5 U	0.66 J
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U

16WW44				
Date	4/12/2021	7/12/2021	10/25/2021	1/10/2022
Perchlorate	0.134	1.35	0.2 U	3.2
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 J
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U

16WW58				
Date	4/13/2021	7/14/2021	10/13/2021	1/13/2022
Perchlorate	0.0348 J	1 U	0.2 UJ	0.2 U
Trichloroethene	**1,100**	**1,000**	**3,300**	**5,500**
cis-1,2-Dichloroethene	49	52	**120**	**170**
Vinyl chloride	0.5 U	2.5 U	2.5 U	5 U

16WW38				
Date	4/12/2021	7/12/2021	10/25/2021	1/10/2022
Perchlorate	0.05 U	2.5 U	0.2 U	0.17 J
Trichloroethene	**2,100**	**2,000**	**1,200**	**1,200**
cis-1,2-Dichloroethene	**600**	**1,000**	**870**	**380**
Vinyl chloride	**39**	**37**	**48**	**30**

16WW27				
Date	4/22/2021	7/28/2021	10/18/2021	1/25/2022
Perchlorate	0.05 U	0.25 U	0.2 U	0.2 U
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U

16WW37				
Date	4/12/2021	7/12/2021	10/25/2021	1/10/2022
Perchlorate	1.6	2.74	**168**	**55.3**
Trichloroethene	**110**	**89**	**190**	**180**
cis-1,2-Dichloroethene	5.8	5.4	15	13
Vinyl chloride	**2.2**	0.5 U	**4.2**	**4.9**

16WW43				
Date	4/22/2021	7/28/2021	10/18/2021	1/25/2022
Perchlorate	0.25 U	0.05 U	0.2 U	0.2 U
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U

16WW24				
Date	4/22/2021	7/14/2021	10/13/2021	1/27/2022
Perchlorate	0.05 U	0.5 U	0.2 U	0.2 U
Trichloroethene	0.5 U	0.5 U	1.2	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U

16WW23				
Date	4/22/2021	7/14/2021	10/13/2021	1/27/2022
Perchlorate	0.05 U	2 U	0.2 UJ	1 U
Trichloroethene	0.5 U	0.5 U	1.8	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U

Biobarrier 3
Biobarrier 2
Biobarrier 1
Bayou Biobarrier
Mid-Plume Area
Harrison Bayou
Central Creek
AVE "Q"

- Shallow Well Location
- Intermediate Well Location
- Groundwater Flow Direction (January 2022)
- Stream
- Road
- LHAAP-16 Landfill Fence
- Building or Tank
- Sub Area

Notes:
1. Blue Highlighting Indicates the concentration exceeds the MCL/PCL.
2. Qualifiers:
J - Estimated: The analyte was positively identified; the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U - Undetected: The analyte was analyzed for, but not detected.
3. NA - Not Analyzed

N

0 125 250 Feet

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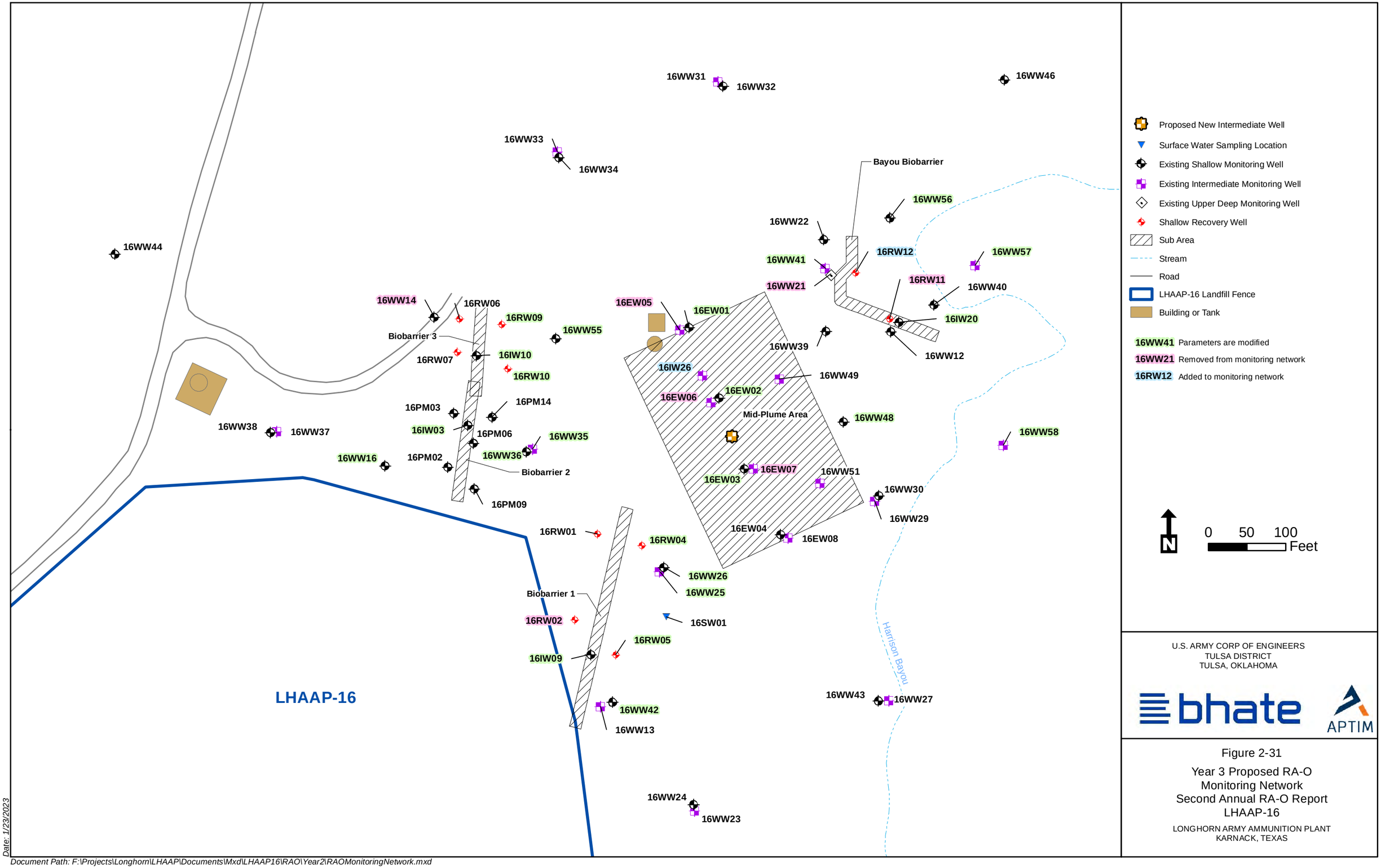
Figure 2-30

Year 2 COC Concentrations in Groundwater Outside Treatment Areas
Second Annual RA-O Report
LHAAP-16

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 1/23/2023

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP16\RAO\Year2\AreasOutsideSubAreas_Year2RAO.mxd



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Figure 2-31

Year 3 Proposed RA-O Monitoring Network
Second Annual RA-O Report
LHAAP-16

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

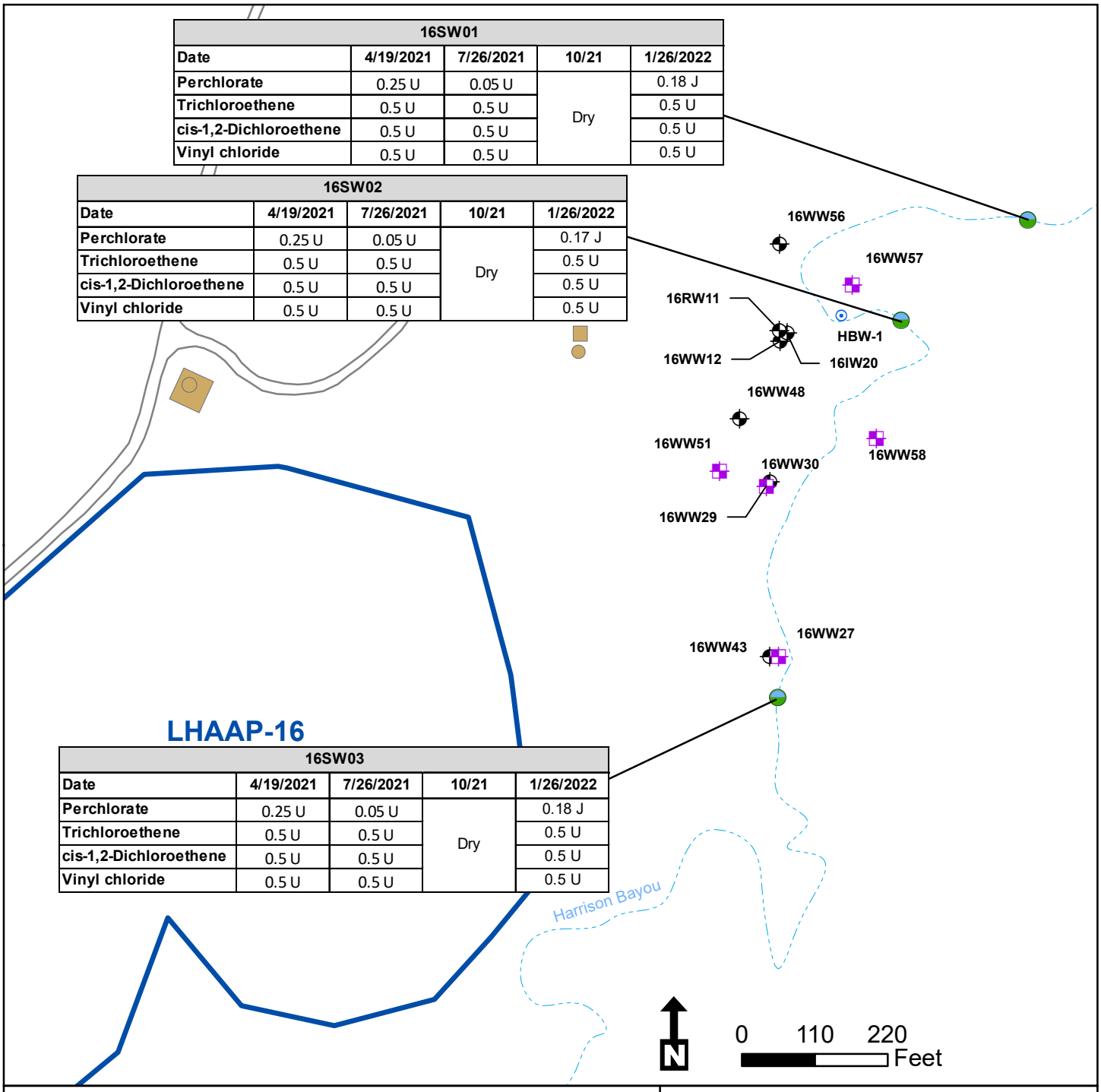
Date: 1/23/2023

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16SW01				
Date	4/19/2021	7/26/2021	10/21	1/26/2022
Perchlorate	0.25 U	0.05 U	Dry	0.18 J
Trichloroethene	0.5 U	0.5 U		0.5 U
cis-1,2-Dichloroethene	0.5 U	0.5 U		0.5 U
Vinyl chloride	0.5 U	0.5 U		0.5 U

16SW02				
Date	4/19/2021	7/26/2021	10/21	1/26/2022
Perchlorate	0.25 U	0.05 U	Dry	0.17 J
Trichloroethene	0.5 U	0.5 U		0.5 U
cis-1,2-Dichloroethene	0.5 U	0.5 U		0.5 U
Vinyl chloride	0.5 U	0.5 U		0.5 U

16SW03				
Date	4/19/2021	7/26/2021	10/21	1/26/2022
Perchlorate	0.25 U	0.05 U	Dry	0.18 J
Trichloroethene	0.5 U	0.5 U		0.5 U
cis-1,2-Dichloroethene	0.5 U	0.5 U		0.5 U
Vinyl chloride	0.5 U	0.5 U		0.5 U



- Surface Water Sample Location
- Shallow Monitoring Well
- Intermediate Monitoring Well
- Water Level Gauge
- Stream
- Road
- LHAAP-16 Landfill Fence
- Building or Tank

Notes:
1. Blue Highlighting Indicates the concentration exceeds the MCL/PCL.
2. Qualifiers:
U - Undetected: The analyte was analyzed for, but not detected.
3. Concentrations are shown in micrograms per liter (µg/L).
4. There was no flow in October 2021 and therefore samples were not collected.

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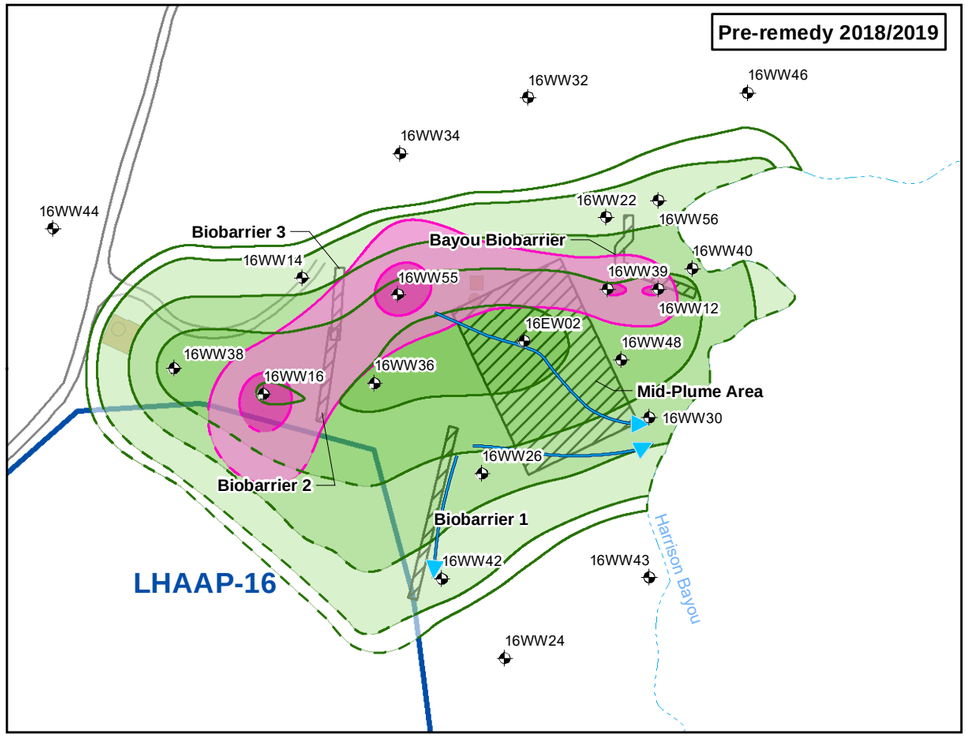
Figure 2-32

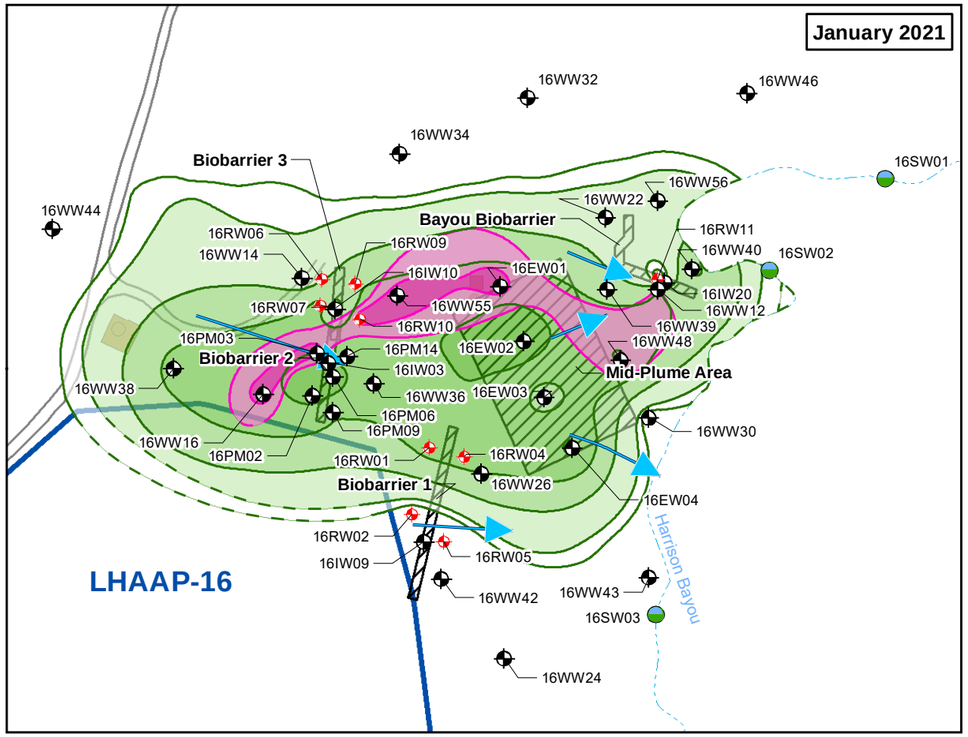
Year 2 Surface Water Sampling Results
Second Annual RA-O Report
LHAAP-16

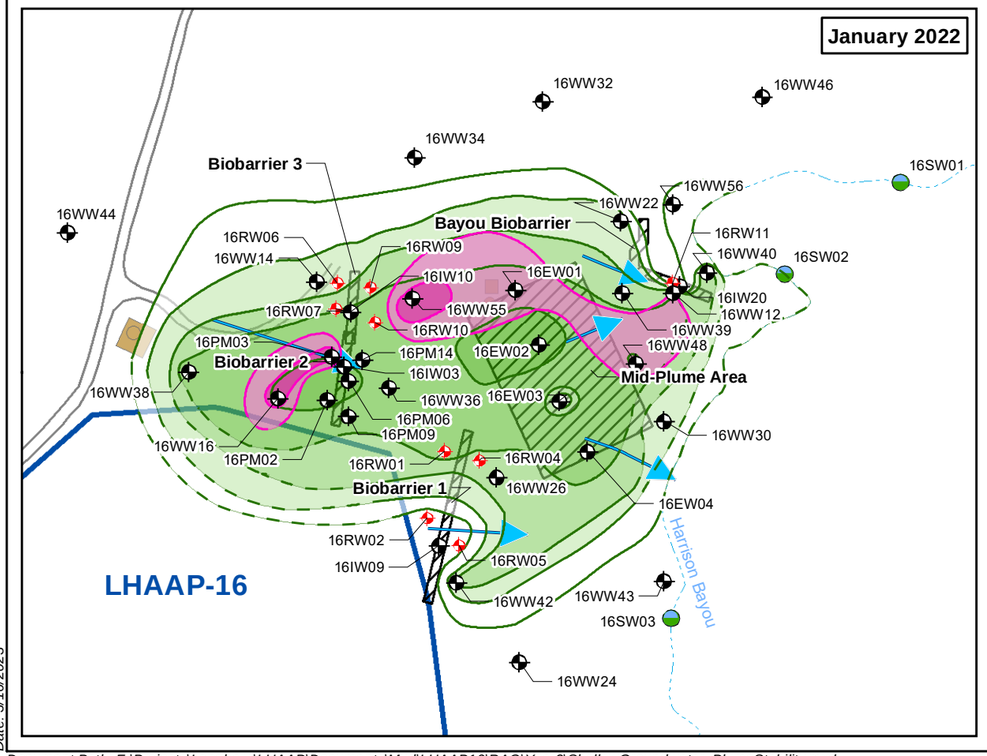
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 5/4/2022

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Existing Shallow Monitoring Well
Groundwater Flow Direction
Stream
Road
LHAAP-16 Landfill Fence
Building or Tank
Sub Area

Perchlorate Plume (µg/L)
- 17 - 100
- >100

Trichloroethene (TCE) Plume (µg/L)
- 5 - 10
- 10 - 100
- 100 - 1,000
- 1,000 - 10,000
- >10,000

Notes:
1. Perchlorate MCL/PCL = 17 µg/L
TCE MCL/PCL = 5 µg/L
2. Qualifiers:
J - Estimated: The analyte was positively identified; the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U - Undetected: The analyte was analyzed for, but not detected.
3. µg/L = micrograms per liter

N

0 75 150
Feet

U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

bhate APTIM

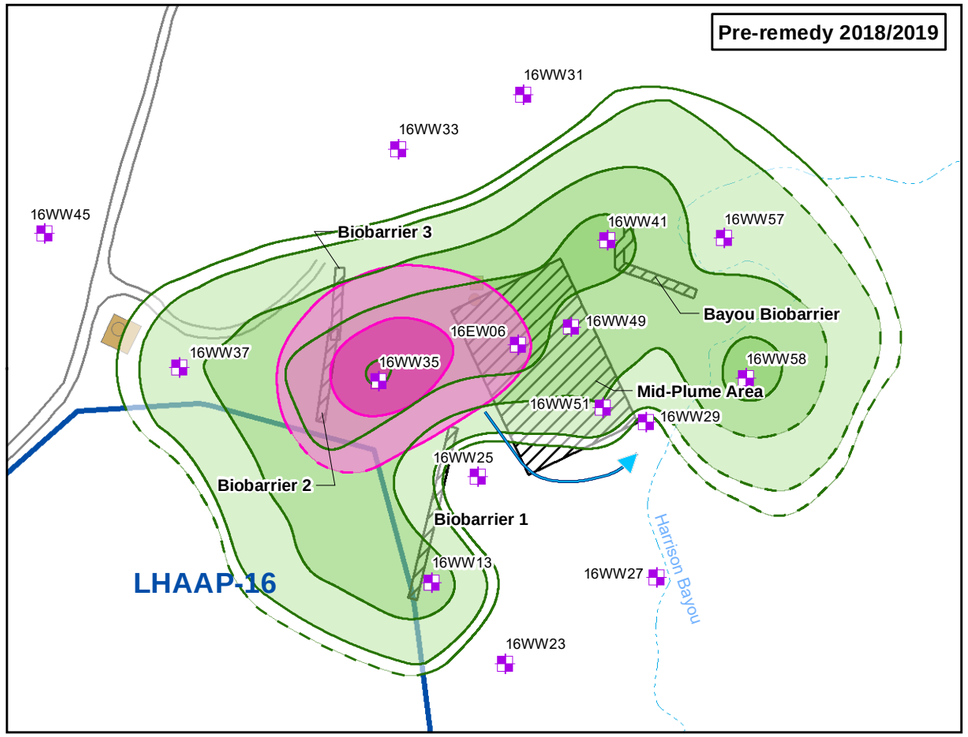
Figure 3-1

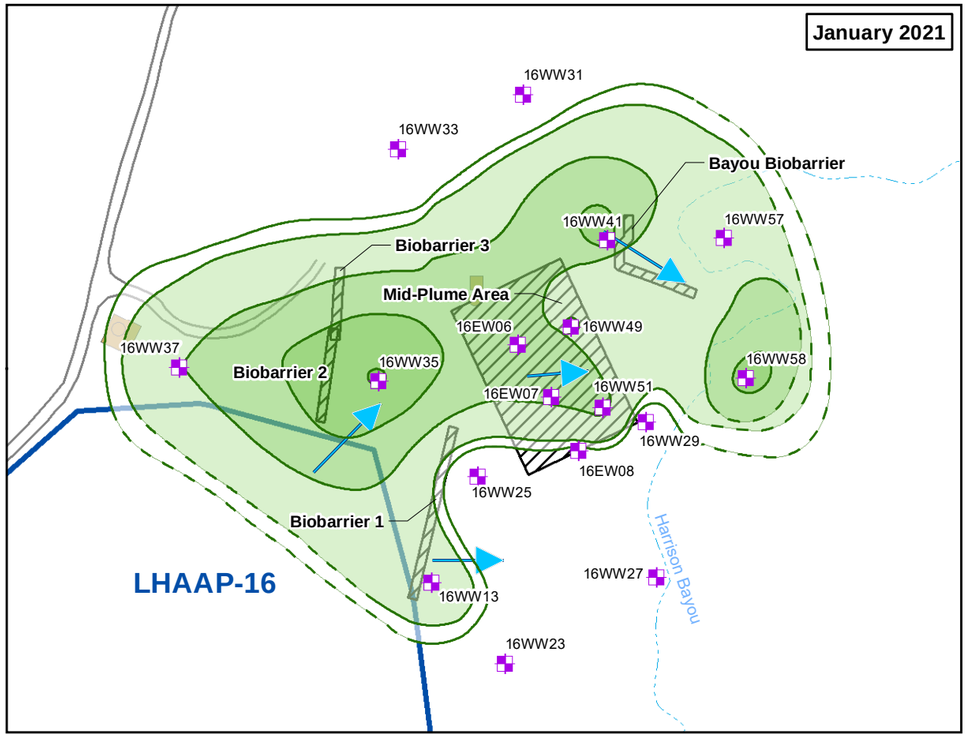
Shallow Zone Pume Stability
Second Annual RA-O Report
LHAAP-16

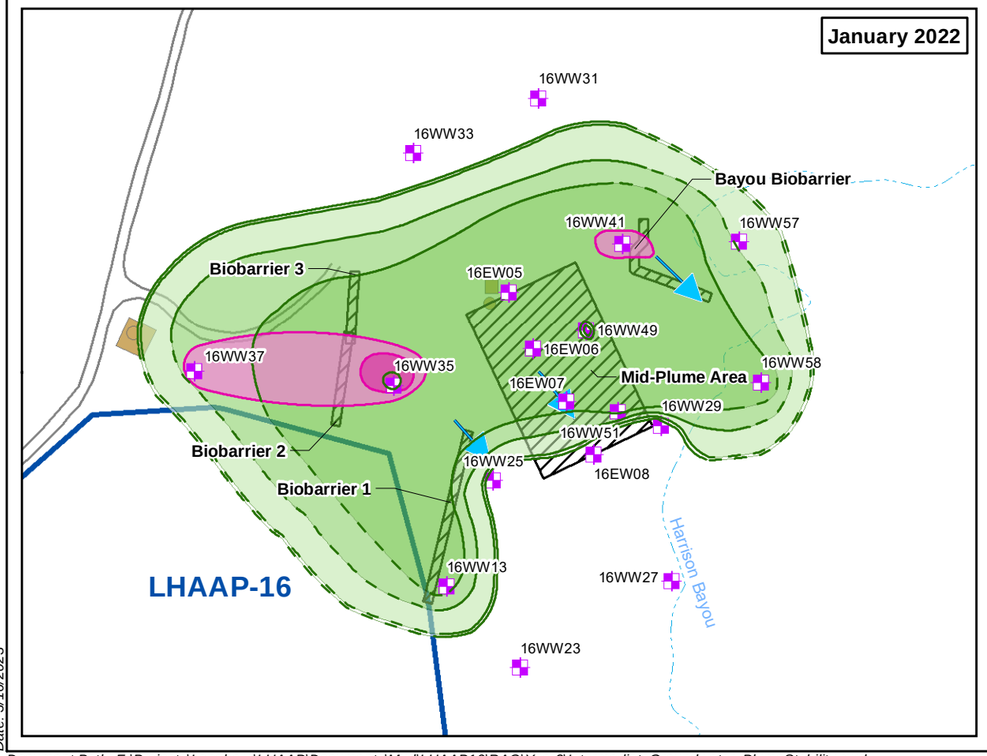
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 3/16/2023

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP16\RAO\Year2\ShallowGroundwater_PlumeStability.mxd







- Existing Intermediate Monitoring Well
- Groundwater Flow Direction
- Stream
- Road
- LHAAP-16 Landfill Fence
- Building or Tank
- Sub Area

Perchlorate Plume (µg/L)
- 17 - 100
- >100

Trichloroethene (TCE) Plume (µg/L)
- 5 - 10
- 10 - 100
- 100 - 1,000
- 1,000 - 10,000
- >10,000

Notes:
1. Perchlorate MCL/PCL = 17 µg/L
TCE MCL/PCL = 5 µg/L
2. Qualifiers:
J - Estimated: The analyte was positively identified; the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U - Undetected: The analyte was analyzed for, but not detected.
3. µg/L = micrograms per liter

N

0 65 130
Feet

U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

bhate APTIM

Figure 3-2

Intermediate Zone Pume Stability
Second Annual RA-O Report
LHAAP-16

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 3/16/2023

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP16\RAO\Year2\IntermediateGroundwater_PlumeStability.mxd

Appendix A

Annual Land Use Control Compliance Certification and Documentation

Inspection and Maintenance Checklist

General Information	
Project Name	Inspection and Maintenance, LHAAP-16 Landfill, Longhorn Army Ammunition Plant, Karnack, TX
Contractor	AptIm
Inspector's Name	Scott Beesinger
Inspector's Title	Senior Field Tech
Inspector's Signature	Scott Beesinger
Inspector's Contact Number	(903) 930-6193
Inspection Date	10/25/21
Type of Inspection	☐ Quarterly ☐ Semiannual ☒ Annual ☐ Prior to forecast rain ☐ After a rain event ☐ Other ----------

Description		Yes	No	N/A	Comments (Attach photos/location sketches)	Corrective Action (Attach photos)
A. CAP Cover Surface						
A.1	Are there any significant cracks present?		X			
A.2.	Are there any damaged areas?		X			
A.3	Is there any ponded water present?		X			
A.4	Any other relevant observations?		X			
B. CAP Vegetation and Animal Burrows						
B.1	Are there signs of stressed/ dead vegetation?		X			
B.2	Are there any significant bare spots?		X			
B.3	Are deep-rooted plants present?		X			
B.4	Are there signs of animal burrows?		X			
B. 5	Any other relevant observations?		X			

Description		Yes	No	N/A	Comments (Attach photos/location sketches)	Corrective Action (Attach photos)
C. CAP Erosion and Drainage System						
C.1	Is there any evidence of significant/ clearly visible erosion, settlement, or other deterioration?		X			
C.2	Are the drainage systems in poor condition?		X			
C.3	Is there excessive silting or debris clogging?		X			
C.4	Is there erosion of banks and slopes?		X			
C.5	Are there areas of choking by overgrown vegetation?		X			
C.7	Is there pooling of water in or along side a channel or berm?		X			
C.8	Any other relevant observations?		X			
D. Groundwater Monitoring Wells						
D.1	Are the installed groundwater monitoring wells in poor condition?		X			
D.2	Are there any signs of damage, unusual wear, rust and corrosion, vandalism, unauthorized entry/use, or settlement?		X			
D.3	Is well cap and/or locking mechanism not properly functioning?	X				
D.4	Are the well heads and protective casings damaged?		X			
D.5	Is the well cleared of vegetation and accessible?	X				
D.6	Any other relevant observations?		X			

Description		Yes	No	N/A	Comments (Attach photos/location sketches)	Corrective Action (Attach photos)
E. Site Access Features						
E.1	Are the perimeter fence and gates damaged?		X			
E.2	Gate(s) damaged?		X			
E.3	Litter encountered within the area?		X			
E.4	Are the gate locks missing?		X			
E.4	Are signs to prevent unauthorized entry missing?		X			
E.5	Are the access roads in unusable or poor condition?		X			
E.6	Any other relevant observations?		X			
F. Concrete Aprons and Bollards						
F.1	Are there any significant cracks present?		X			
F.2	Are there any damaged areas?		X			
F.3	Any other relevant observations?		X			

Annual Land Use Control Compliance Inspection Form

In accordance with the Remedial Design dated _____ for LHAAP-16 an inspection of the site was conducted by Aptim [indicate transferee] on 10/25/21.

The land use control mechanisms are:

- Groundwater restrictions - prohibit access to the contaminated groundwater except for environmental monitoring and testing only until cleanup goals are met;
- Landfill integrity - preserve the integrity of the landfill cap and restrict intrusive activities (e.g., digging) that would degrade or alter the cap;
- Land use restrictions - restrict land use to nonresidential;
- Integrity of remedial and monitoring systems - maintain the integrity of any current or future remedial or monitoring systems until cleanup goals are met.

No unauthorized activities or uses have occurred. Compliance with land use controls and restrictions is as follows:

- No use of groundwater (other than environmental testing and monitoring), installation of new groundwater wells, or tampering with existing monitoring wells;
- No landfill intrusive activities (e.g., digging) that would degrade or alter the landfill cap; maintenance of vegetative cover and repair of soil subsidence or erosion areas on the cap;
- No land use other than nonresidential; and
- No activities that would compromise the integrity of the remedial or monitoring systems.

I, the undersigned, do document that the inspection was conducted as indicated above, and that the above information is true and correct to the best of my knowledge, information, and belief.

Date: OCTOBER 25, 2021

Name/Title: Scott Beesinger Senior Field Tech

Signature: Scott Beesinger

Annual compliance certification forms shall be completed no later than March 1 of each year for the previous calendar year, retained in the file and provided to Army, EPA and TCEQ upon request.

Appendix B

Photographic Log and Well Inspection Forms

(Provided electronically on CD and on the Portal)

Appendix C

Groundwater Sampling Forms

(Provided electronically on CD and on the Portal)

Note: The SCL for 16IW03 for Q1 has been revised to correct the screen interval.

Appendix D

Laboratory Analytical Data Package

10515 Research Drive
Knoxville, TN 37932
Phone: (865) 573-8188
Fax: (865) 573-8133

Client:	Vicki Graves APTIM 2410 Cherahala Blvd Knoxville, TN 37932 US	**Phone:**	865-560-7818 **Fax:**

Identifier: 052SD **Date Rec:** 04/14/2021 **Report Date:** 04/28/2021

Client Project #: 501032 **Client Project Name:** LHAAP 16 April 2021

Purchase Order #: 204818

Test results provided for: CENSUS

Reviewed By:



NOTICE: This report is intended only for the addressee shown above and may contain confidential or privileged information. If the recipient of this material is not the intended recipient or if you have received this in error, please notify Microbial Insights, Inc. immediately. The data and other information in this report represent only the sample(s) analyzed and are rendered upon condition that it is not to be reproduced without approval from Microbial Insights, Inc. Thank you for your cooperation.

Results relate only to the items tested and the sample(s) as received by the laboratory.

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **APTIM**
Project: LHAAP 16 April 2021

MI Project Number: **052SD**
Date Received: 04/14/2021

Sample Information

Client Sample ID:		**16WW58-210413**	**16WW57-210413**	**16WW35-210413**	**16WW36-210413**	**16WW16-210415**
Sample Date:		04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/15/2021
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		HT/CB	HT/CB	HT/CB	HT/CB	HT/CB
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**1.30E+01**	**3.10E+00**	**3.00E+01**	**6.20E+02**	**9.80E-02 (J)**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **APTIM**
Project: LHAAP 16 April 2021

MI Project Number: **052SD**
Date Received: 04/14/2021

Sample Information

Client Sample ID:		**16WW56-210415**	**16WW22-210415**	**16WW41-210415**	**16WW25-210420**	**16WW26-210420**
Sample Date:		04/15/2021	04/15/2021	04/15/2021	04/20/2021	04/20/2021
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		HT/CB	HT/CB	HT/CB	HT/CB	HT/CB
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**2.19E+01**	**1.37E+01**	<5.00E-01	<5.00E-01	**2.90E+00**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **APTIM**
Project: LHAAP 16 April 2021

MI Project Number: **052SD**
Date Received: 04/14/2021

Sample Information

Client Sample ID:		**16WW29-210420**	**16WW55-210420**	**16WW48-210422**
Sample Date:		04/20/2021	04/20/2021	04/22/2021
Units:		cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		HT/CB	HT/CB	HT/CB
Dechlorinating Bacteria				
Dehalococcoides	*DHC*	**1.99E+01**	**2.00E-01 (J)**	**1.92E+02**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

Quality Assurance/Quality Control Data

Samples Received **4/14/2021**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	04/14/2021	04/28/2021	0 °C	108%	non-detect	non-detect

Samples Received **4/19/2021**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	04/19/2021	04/28/2021	11 °C	100%	non-detect	non-detect

Samples Received **4/21/2021**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	04/21/2021	04/28/2021	0 °C	100%	non-detect	non-detect

Samples Received **4/23/2021**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	04/23/2021	04/28/2021	0 °C	100%	non-detect	non-detect

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

April 30, 2021

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS21040695**

Laboratory Results for: **Longhorn Army Ammunition Plant 16 April 2021**

Dear Vicki Graves ,

ALS Environmental received 18 sample(s) on Apr 14, 2021 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Work Order: HS21040695

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21040695-01	16WW44-210412	Groundwater		12-Apr-2021 07:40	14-Apr-2021 09:45	☐
HS21040695-02	16WW38-210412	Groundwater		12-Apr-2021 08:30	14-Apr-2021 09:45	☐
HS21040695-03	16WW37-210412	Groundwater		12-Apr-2021 09:15	14-Apr-2021 09:45	☐
HS21040695-04	16WW14-210412	Groundwater		12-Apr-2021 10:00	14-Apr-2021 09:45	☐
HS21040695-05	16WW34-210412	Groundwater		12-Apr-2021 10:45	14-Apr-2021 09:45	☐
HS21040695-06	16WW34-210412-FD	Groundwater		12-Apr-2021 10:45	14-Apr-2021 09:45	☐
HS21040695-07	16WW33-210412	Groundwater		12-Apr-2021 11:30	14-Apr-2021 09:45	☐
HS21040695-08	16WW32-210412	Groundwater		12-Apr-2021 12:15	14-Apr-2021 09:45	☐
HS21040695-09	16WW31-210412	Groundwater		12-Apr-2021 13:00	14-Apr-2021 09:45	☐
HS21040695-10	16WW46-210412	Groundwater		12-Apr-2021 13:45	14-Apr-2021 09:45	☐
HS21040695-11	16WW58-210413	Groundwater		13-Apr-2021 07:40	14-Apr-2021 09:45	☐
HS21040695-12	16WW57-210413	Groundwater		13-Apr-2021 08:30	14-Apr-2021 09:45	☐
HS21040695-13	16WW35-210413	Groundwater		13-Apr-2021 09:40	14-Apr-2021 09:45	☐
HS21040695-14	16WW36-210413	Groundwater		13-Apr-2021 10:30	14-Apr-2021 09:45	☐
HS21040695-15	16PM09-210413	Groundwater		13-Apr-2021 11:15	14-Apr-2021 09:45	☐
HS21040695-16	16PM06-210413	Groundwater		13-Apr-2021 12:05	14-Apr-2021 09:45	☐
HS21040695-17	16PM14-210413	Groundwater		13-Apr-2021 12:50	14-Apr-2021 09:45	☐
HS21040695-18	Trip Blank-210413	Water		13-Apr-2021 00:00	14-Apr-2021 09:45	☐

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant 16 April 2021
Work Order: HS21040695

Work Order Comments

• The analysis for Perchlorate was subcontracted to our ALS Houston TX, High Resolution Lab. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R382191

Sample ID: 16WW57-210413 (HS21040695-12)

• Preservation of VOA vials can only be verified after samples are analyzed. Based on the post-analytical screening, the following chemically-preserved samples were found to have a pH >2.

Sample ID: HS21040859-08MS

• MS and MSD are for an unrelated sample

GCMS Volatiles by Method SW8260

Batch ID: R381740,R381840

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Batch ID: R381732

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM5310B

Batch ID: R382301,R382505

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM2320B

Batch ID: R381715

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: R382442

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Batch ID: R381622

Sample ID: 16WW35-210413 (HS21040695-13)

• Sample ran at 5X due to high concentration of Sulfate

Sample ID: 16WW36-210413 (HS21040695-14)

• Sample ran at 5X due to high concentration of Sulfate

Sample ID: 16WW57-210413 (HS21040695-12)

• Sample ran at 5X due to high concentration of Sulfate

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16WW44-210412
Collection Date: 12-Apr-2021 07:40

ANALYTICAL REPORT
WorkOrder:HS21040695
Lab ID:HS21040695-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Apr-2021 13:57
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 13:57
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 13:57
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 13:57
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	15-Apr-2021 13:57
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 13:57
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 13:57
Surr: 1,2-Dichloroethane-d4	*97.0*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2021 13:57*
Surr: 4-Bromofluorobenzene	*96.6*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2021 13:57*
Surr: Dibromofluoromethane	*91.2*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2021 13:57*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2021 13:57*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16WW38-210412
Collection Date: 12-Apr-2021 08:30

ANALYTICAL REPORT
WorkOrder:HS21040695
Lab ID:HS21040695-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	16-Apr-2021 05:02
1,1-Dichloroethene	**11**		**2.0**	**5.0**	**10**	**ug/L**	10	16-Apr-2021 05:02
1,2-Dichloroethane	5.0	U	2.0	5.0	10	ug/L	10	16-Apr-2021 05:02
cis-1,2-Dichloroethene	**600**		**2.0**	**5.0**	**10**	**ug/L**	10	16-Apr-2021 05:02
Methylene chloride	**16**	J	**4.0**	**20**	**20**	**ug/L**	10	16-Apr-2021 05:02
Trichloroethene	**2,100**		**20**	**50**	**100**	**ug/L**	100	16-Apr-2021 05:23
Vinyl chloride	**39**		**2.0**	**5.0**	**10**	**ug/L**	10	16-Apr-2021 05:02
Surr: 1,2-Dichloroethane-d4	*98.0*			**0**	*81-118*	*%REC*	*10*	*16-Apr-2021 05:02*
Surr: 1,2-Dichloroethane-d4	*97.4*			**0**	*81-118*	*%REC*	*100*	*16-Apr-2021 05:23*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*10*	*16-Apr-2021 05:02*
Surr: 4-Bromofluorobenzene	*91.2*			**0**	*85-114*	*%REC*	*100*	*16-Apr-2021 05:23*
Surr: Dibromofluoromethane	*92.1*			**0**	*80-119*	*%REC*	*10*	*16-Apr-2021 05:02*
Surr: Dibromofluoromethane	*92.0*			**0**	*80-119*	*%REC*	*100*	*16-Apr-2021 05:23*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*10*	*16-Apr-2021 05:02*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*100*	*16-Apr-2021 05:23*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16WW37-210412
Collection Date: 12-Apr-2021 09:15

ANALYTICAL REPORT
WorkOrder:HS21040695
Lab ID:HS21040695-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Apr-2021 14:18
1,1-Dichloroethene	**0.90**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2021 14:18
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 14:18
cis-1,2-Dichloroethene	**5.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2021 14:18
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	15-Apr-2021 14:18
Trichloroethene	**110**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2021 14:18
Vinyl chloride	**2.2**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2021 14:18
Surr: 1,2-Dichloroethane-d4	*93.9*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2021 14:18*
Surr: 4-Bromofluorobenzene	*94.9*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2021 14:18*
Surr: Dibromofluoromethane	*87.5*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2021 14:18*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2021 14:18*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16WW14-210412
Collection Date: 12-Apr-2021 10:00

ANALYTICAL REPORT
WorkOrder:HS21040695
Lab ID:HS21040695-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Apr-2021 23:25
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 23:25
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 23:25
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 23:25
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	15-Apr-2021 23:25
Trichloroethene	**17**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2021 23:25
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 23:25
Surr: 1,2-Dichloroethane-d4	*95.5*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2021 23:25*
Surr: 4-Bromofluorobenzene	*96.4*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2021 23:25*
Surr: Dibromofluoromethane	*91.9*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2021 23:25*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2021 23:25*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16WW34-210412
Collection Date: 12-Apr-2021 10:45

ANALYTICAL REPORT
WorkOrder:HS21040695
Lab ID:HS21040695-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	16-Apr-2021 02:35
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 02:35
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 02:35
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 02:35
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	16-Apr-2021 02:35
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 02:35
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 02:35
Surr: 1,2-Dichloroethane-d4	*97.1*			**0**	*81-118*	*%REC*	*1*	*16-Apr-2021 02:35*
Surr: 4-Bromofluorobenzene	*95.1*			**0**	*85-114*	*%REC*	*1*	*16-Apr-2021 02:35*
Surr: Dibromofluoromethane	*89.5*			**0**	*80-119*	*%REC*	*1*	*16-Apr-2021 02:35*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*16-Apr-2021 02:35*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16WW34-210412-FD
Collection Date: 12-Apr-2021 10:45

ANALYTICAL REPORT
WorkOrder:HS21040695
Lab ID:HS21040695-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	16-Apr-2021 02:56
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 02:56
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 02:56
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 02:56
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	16-Apr-2021 02:56
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 02:56
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 02:56
Surr: 1,2-Dichloroethane-d4	*96.1*			**0**	*81-118*	*%REC*	*1*	*16-Apr-2021 02:56*
Surr: 4-Bromofluorobenzene	*98.3*			**0**	*85-114*	*%REC*	*1*	*16-Apr-2021 02:56*
Surr: Dibromofluoromethane	*92.2*			**0**	*80-119*	*%REC*	*1*	*16-Apr-2021 02:56*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*16-Apr-2021 02:56*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16WW33-210412
Collection Date: 12-Apr-2021 11:30

ANALYTICAL REPORT
WorkOrder:HS21040695
Lab ID:HS21040695-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	16-Apr-2021 03:17
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 03:17
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 03:17
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 03:17
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	16-Apr-2021 03:17
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 03:17
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 03:17
Surr: 1,2-Dichloroethane-d4	*97.2*			**0**	*81-118*	*%REC*	*1*	*16-Apr-2021 03:17*
Surr: 4-Bromofluorobenzene	*94.4*			**0**	*85-114*	*%REC*	*1*	*16-Apr-2021 03:17*
Surr: Dibromofluoromethane	*92.4*			**0**	*80-119*	*%REC*	*1*	*16-Apr-2021 03:17*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*16-Apr-2021 03:17*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16WW32-210412
Collection Date: 12-Apr-2021 12:15

ANALYTICAL REPORT
WorkOrder:HS21040695
Lab ID:HS21040695-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	16-Apr-2021 03:38
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 03:38
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 03:38
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 03:38
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	16-Apr-2021 03:38
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 03:38
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 03:38
Surr: 1,2-Dichloroethane-d4	*99.0*			**0**	*81-118*	*%REC*	*1*	*16-Apr-2021 03:38*
Surr: 4-Bromofluorobenzene	*94.3*			**0**	*85-114*	*%REC*	*1*	*16-Apr-2021 03:38*
Surr: Dibromofluoromethane	*89.6*			**0**	*80-119*	*%REC*	*1*	*16-Apr-2021 03:38*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*16-Apr-2021 03:38*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16WW31-210412
Collection Date: 12-Apr-2021 13:00

ANALYTICAL REPORT
WorkOrder:HS21040695
Lab ID:HS21040695-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	16-Apr-2021 03:59
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 03:59
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 03:59
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 03:59
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	16-Apr-2021 03:59
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 03:59
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 03:59
Surr: 1,2-Dichloroethane-d4	*96.5*			**0**	*81-118*	*%REC*	*1*	*16-Apr-2021 03:59*
Surr: 4-Bromofluorobenzene	*93.7*			**0**	*85-114*	*%REC*	*1*	*16-Apr-2021 03:59*
Surr: Dibromofluoromethane	*92.7*			**0**	*80-119*	*%REC*	*1*	*16-Apr-2021 03:59*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*16-Apr-2021 03:59*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16WW46-210412
Collection Date: 12-Apr-2021 13:45

ANALYTICAL REPORT
WorkOrder:HS21040695
Lab ID:HS21040695-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	16-Apr-2021 04:20
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 04:20
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 04:20
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 04:20
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	16-Apr-2021 04:20
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 04:20
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 04:20
Surr: 1,2-Dichloroethane-d4	*99.2*			**0**	*81-118*	*%REC*	*1*	*16-Apr-2021 04:20*
Surr: 4-Bromofluorobenzene	*96.1*			**0**	*85-114*	*%REC*	*1*	*16-Apr-2021 04:20*
Surr: Dibromofluoromethane	*92.0*			**0**	*80-119*	*%REC*	*1*	*16-Apr-2021 04:20*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*16-Apr-2021 04:20*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16WW58-210413
Collection Date: 13-Apr-2021 07:40

ANALYTICAL REPORT
WorkOrder:HS21040695
Lab ID:HS21040695-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	16-Apr-2021 16:40
1,1-Dichloroethene	**1.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	16-Apr-2021 16:40
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 16:40
cis-1,2-Dichloroethene	**49**		**0.20**	**0.50**	**1.0**	**ug/L**	1	16-Apr-2021 16:40
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	16-Apr-2021 16:40
Trichloroethene	**1,100**		**2.0**	**5.0**	**10**	**ug/L**	10	16-Apr-2021 17:01
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 16:40
Surr: 1,2-Dichloroethane-d4	*98.9*			**0**	*81-118*	*%REC*	*1*	*16-Apr-2021 16:40*
Surr: 1,2-Dichloroethane-d4	*97.8*			**0**	*81-118*	*%REC*	*10*	*16-Apr-2021 17:01*
Surr: 4-Bromofluorobenzene	*97.6*			**0**	*85-114*	*%REC*	*1*	*16-Apr-2021 16:40*
Surr: 4-Bromofluorobenzene	*96.4*			**0**	*85-114*	*%REC*	*10*	*16-Apr-2021 17:01*
Surr: Dibromofluoromethane	*93.3*			**0**	*80-119*	*%REC*	*1*	*16-Apr-2021 16:40*
Surr: Dibromofluoromethane	*92.3*			**0**	*80-119*	*%REC*	*10*	*16-Apr-2021 17:01*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*10*	*16-Apr-2021 17:01*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*16-Apr-2021 16:40*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	21-Apr-2021 10:49
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	21-Apr-2021 10:49
Methane	**0.00629**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	21-Apr-2021 10:49
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**98.4**		**5.00**	**5.00**	**5.00**	**mg/L**	1	15-Apr-2021 21:34
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**3.43**		**0.500**	**0.500**	**1.00**	**mg/L**	1	23-Apr-2021 17:26
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**2.50**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	14-Apr-2021 15:43
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	14-Apr-2021 15:43
Sulfate	**282**		**2.00**	**5.00**	**5.00**	**mg/L**	10	26-Apr-2021 19:05
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16WW57-210413
Collection Date: 13-Apr-2021 08:30

ANALYTICAL REPORT
WorkOrder:HS21040695
Lab ID:HS21040695-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	16-Apr-2021 04:41
1,1-Dichloroethene	**1.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	16-Apr-2021 04:41
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 04:41
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 04:41
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	16-Apr-2021 04:41
Trichloroethene	**57**		**0.20**	**0.50**	**1.0**	**ug/L**	1	16-Apr-2021 04:41
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2021 04:41
Surr: 1,2-Dichloroethane-d4	*99.2*			**0**	*81-118*	*%REC*	*1*	*16-Apr-2021 04:41*
Surr: 4-Bromofluorobenzene	*94.1*			**0**	*85-114*	*%REC*	*1*	*16-Apr-2021 04:41*
Surr: Dibromofluoromethane	*91.7*			**0**	*80-119*	*%REC*	*1*	*16-Apr-2021 04:41*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*1*	*16-Apr-2021 04:41*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	21-Apr-2021 11:07
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	21-Apr-2021 11:07
Methane	**0.00141**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	21-Apr-2021 11:07
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**175**		**5.00**	**5.00**	**5.00**	**mg/L**	1	15-Apr-2021 21:56
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**16.8**		**0.500**	**0.500**	**1.00**	**mg/L**	1	23-Apr-2021 17:44
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**4.78**		**0.150**	**0.500**	**0.500**	**mg/L**	5	14-Apr-2021 16:38
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	14-Apr-2021 16:38
Sulfate	**2,360**		**10.0**	**25.0**	**25.0**	**mg/L**	50	26-Apr-2021 19:24
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16WW35-210413
Collection Date: 13-Apr-2021 09:40

ANALYTICAL REPORT
WorkOrder:HS21040695
Lab ID:HS21040695-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	16-Apr-2021 05:44
1,1-Dichloroethene	**85**		**2.0**	**5.0**	**10**	**ug/L**	10	16-Apr-2021 05:44
1,2-Dichloroethane	5.0	U	2.0	5.0	10	ug/L	10	16-Apr-2021 05:44
cis-1,2-Dichloroethene	**2,100**		**20**	**50**	**100**	**ug/L**	100	16-Apr-2021 06:05
Methylene chloride	**17**	J	**4.0**	**20**	**20**	**ug/L**	10	16-Apr-2021 05:44
Trichloroethene	**9,300**		**20**	**50**	**100**	**ug/L**	100	16-Apr-2021 06:05
Vinyl chloride	**90**		**2.0**	**5.0**	**10**	**ug/L**	10	16-Apr-2021 05:44
Surr: 1,2-Dichloroethane-d4	*98.0*			**0**	*81-118*	*%REC*	*10*	*16-Apr-2021 05:44*
Surr: 1,2-Dichloroethane-d4	*98.4*			**0**	*81-118*	*%REC*	*100*	*16-Apr-2021 06:05*
Surr: 4-Bromofluorobenzene	*93.8*			**0**	*85-114*	*%REC*	*10*	*16-Apr-2021 05:44*
Surr: 4-Bromofluorobenzene	*96.6*			**0**	*85-114*	*%REC*	*100*	*16-Apr-2021 06:05*
Surr: Dibromofluoromethane	*93.2*			**0**	*80-119*	*%REC*	*10*	*16-Apr-2021 05:44*
Surr: Dibromofluoromethane	*93.3*			**0**	*80-119*	*%REC*	*100*	*16-Apr-2021 06:05*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*10*	*16-Apr-2021 05:44*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*100*	*16-Apr-2021 06:05*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	21-Apr-2021 11:20
Ethene	**0.00875**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	21-Apr-2021 11:20
Methane	**0.102**		**0.00107**	**0.00500**	**0.00500**	**mg/L**	10	21-Apr-2021 11:43
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**1,090**		**5.00**	**5.00**	**5.00**	**mg/L**	1	15-Apr-2021 22:05
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**59.1**		**5.00**	**5.00**	**10.0**	**mg/L**	10	27-Apr-2021 17:43
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	0.500	U	0.150	0.500	0.500	mg/L	5	14-Apr-2021 16:56
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	14-Apr-2021 16:56
Sulfate	**9,810**		**100**	**250**	**250**	**mg/L**	500	26-Apr-2021 19:42
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16WW36-210413
Collection Date: 13-Apr-2021 10:30

ANALYTICAL REPORT
WorkOrder:HS21040695
Lab ID:HS21040695-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	25	U	7.5	25	25	ug/L	25	16-Apr-2021 06:26
1,1-Dichloroethene	**74**		**5.0**	**12**	**25**	**ug/L**	25	16-Apr-2021 06:26
1,2-Dichloroethane	12	U	5.0	12	25	ug/L	25	16-Apr-2021 06:26
cis-1,2-Dichloroethene	**9,000**		**50**	**120**	**250**	**ug/L**	250	16-Apr-2021 06:47
Methylene chloride	**43**	J	**10**	**50**	**50**	**ug/L**	25	16-Apr-2021 06:26
Trichloroethene	**10,000**		**50**	**120**	**250**	**ug/L**	250	16-Apr-2021 06:47
Vinyl chloride	**78**		**5.0**	**12**	**25**	**ug/L**	25	16-Apr-2021 06:26
Surr: 1,2-Dichloroethane-d4	*100*			**0**	*81-118*	*%REC*	*25*	*16-Apr-2021 06:26*
Surr: 1,2-Dichloroethane-d4	*97.1*			**0**	*81-118*	*%REC*	*250*	*16-Apr-2021 06:47*
Surr: 4-Bromofluorobenzene	*96.5*			**0**	*85-114*	*%REC*	*25*	*16-Apr-2021 06:26*
Surr: 4-Bromofluorobenzene	*96.8*			**0**	*85-114*	*%REC*	*250*	*16-Apr-2021 06:47*
Surr: Dibromofluoromethane	*93.4*			**0**	*80-119*	*%REC*	*25*	*16-Apr-2021 06:26*
Surr: Dibromofluoromethane	*91.3*			**0**	*80-119*	*%REC*	*250*	*16-Apr-2021 06:47*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*250*	*16-Apr-2021 06:47*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*25*	*16-Apr-2021 06:26*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	21-Apr-2021 11:30
Ethene	**0.00490**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	21-Apr-2021 11:30
Methane	**0.151**		**0.00107**	**0.00500**	**0.00500**	**mg/L**	10	21-Apr-2021 11:52
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**479**		**5.00**	**5.00**	**5.00**	**mg/L**	1	15-Apr-2021 22:12
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**15.1**		**0.500**	**0.500**	**1.00**	**mg/L**	1	23-Apr-2021 18:17
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**1.96**		**0.150**	**0.500**	**0.500**	**mg/L**	5	14-Apr-2021 17:15
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	14-Apr-2021 17:15
Sulfate	**1,850**		**10.0**	**25.0**	**25.0**	**mg/L**	50	26-Apr-2021 20:00
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16PM09-210413
Collection Date: 13-Apr-2021 11:15

ANALYTICAL REPORT
WorkOrder:HS21040695
Lab ID:HS21040695-15
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	**0.82**	J	**0.30**	**1.0**	**1.0**	**ug/L**	1	15-Apr-2021 23:46
1,1-Dichloroethene	**13**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2021 23:46
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 23:46
cis-1,2-Dichloroethene	**210**		**2.0**	**5.0**	**10**	**ug/L**	10	16-Apr-2021 14:55
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	15-Apr-2021 23:46
Trichloroethene	**640**		**2.0**	**5.0**	**10**	**ug/L**	10	16-Apr-2021 14:55
Vinyl chloride	**10**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2021 23:46
Surr: 1,2-Dichloroethane-d4	*97.0*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2021 23:46*
Surr: 1,2-Dichloroethane-d4	*94.6*			**0**	*81-118*	*%REC*	*10*	*16-Apr-2021 14:55*
Surr: 4-Bromofluorobenzene	*94.8*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2021 23:46*
Surr: 4-Bromofluorobenzene	*94.1*			**0**	*85-114*	*%REC*	*10*	*16-Apr-2021 14:55*
Surr: Dibromofluoromethane	*92.0*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2021 23:46*
Surr: Dibromofluoromethane	*91.0*			**0**	*80-119*	*%REC*	*10*	*16-Apr-2021 14:55*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2021 23:46*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*10*	*16-Apr-2021 14:55*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16PM06-210413
Collection Date: 13-Apr-2021 12:05

ANALYTICAL REPORT
WorkOrder:HS21040695
Lab ID:HS21040695-16
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	100	U	30	100	100	ug/L	100	16-Apr-2021 18:05
1,1-Dichloroethene	**120**		**20**	**50**	**100**	**ug/L**	100	16-Apr-2021 18:05
1,2-Dichloroethane	**54**	J	**20**	**50**	**100**	**ug/L**	100	16-Apr-2021 18:05
cis-1,2-Dichloroethene	**42,000**		**100**	**250**	**500**	**ug/L**	500	16-Apr-2021 18:26
Methylene chloride	200	U	40	200	200	ug/L	100	16-Apr-2021 18:05
Trichloroethene	**77,000**		**100**	**250**	**500**	**ug/L**	500	16-Apr-2021 18:26
Vinyl chloride	**1,800**		**20**	**50**	**100**	**ug/L**	100	16-Apr-2021 18:05
Surr: 1,2-Dichloroethane-d4	*98.5*			**0**	*81-118*	*%REC*	*100*	*16-Apr-2021 18:05*
Surr: 1,2-Dichloroethane-d4	*97.6*			**0**	*81-118*	*%REC*	*500*	*16-Apr-2021 18:26*
Surr: 4-Bromofluorobenzene	*96.4*			**0**	*85-114*	*%REC*	*100*	*16-Apr-2021 18:05*
Surr: 4-Bromofluorobenzene	*96.2*			**0**	*85-114*	*%REC*	*500*	*16-Apr-2021 18:26*
Surr: Dibromofluoromethane	*94.7*			**0**	*80-119*	*%REC*	*100*	*16-Apr-2021 18:05*
Surr: Dibromofluoromethane	*93.2*			**0**	*80-119*	*%REC*	*500*	*16-Apr-2021 18:26*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*100*	*16-Apr-2021 18:05*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*500*	*16-Apr-2021 18:26*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16PM14-210413
Collection Date: 13-Apr-2021 12:50

ANALYTICAL REPORT
WorkOrder:HS21040695
Lab ID:HS21040695-17
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	20	U	6.0	20	20	ug/L	20	16-Apr-2021 17:22
1,1-Dichloroethene	**14**	J	**4.0**	**10**	**20**	**ug/L**	20	16-Apr-2021 17:22
1,2-Dichloroethane	**22**		**4.0**	**10**	**20**	**ug/L**	20	16-Apr-2021 17:22
cis-1,2-Dichloroethene	**2,900**		**4.0**	**10**	**20**	**ug/L**	20	16-Apr-2021 17:22
Methylene chloride	40	U	8.0	40	40	ug/L	20	16-Apr-2021 17:22
Trichloroethene	**4,300**		**50**	**120**	**250**	**ug/L**	250	16-Apr-2021 17:43
Vinyl chloride	**110**		**4.0**	**10**	**20**	**ug/L**	20	16-Apr-2021 17:22
Surr: 1,2-Dichloroethane-d4	*99.9*			**0**	*81-118*	*%REC*	*20*	*16-Apr-2021 17:22*
Surr: 1,2-Dichloroethane-d4	*97.8*			**0**	*81-118*	*%REC*	*250*	*16-Apr-2021 17:43*
Surr: 4-Bromofluorobenzene	*97.8*			**0**	*85-114*	*%REC*	*20*	*16-Apr-2021 17:22*
Surr: 4-Bromofluorobenzene	*93.0*			**0**	*85-114*	*%REC*	*250*	*16-Apr-2021 17:43*
Surr: Dibromofluoromethane	*92.6*			**0**	*80-119*	*%REC*	*20*	*16-Apr-2021 17:22*
Surr: Dibromofluoromethane	*93.7*			**0**	*80-119*	*%REC*	*250*	*16-Apr-2021 17:43*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*20*	*16-Apr-2021 17:22*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*250*	*16-Apr-2021 17:43*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
ANALYTICAL REPORT
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21040695
Sample ID: Trip Blank-210413 Lab ID:HS21040695-18
Collection Date: 13-Apr-2021 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Apr-2021 13:36
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 13:36
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 13:36
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 13:36
Methylene chloride	**1.7**	J	**0.40**	**2.0**	**2.0**	**ug/L**	1	15-Apr-2021 13:36
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 13:36
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 13:36
Surr: 1,2-Dichloroethane-d4	*96.0*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2021 13:36*
Surr: 4-Bromofluorobenzene	*94.5*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2021 13:36*
Surr: Dibromofluoromethane	*91.4*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2021 13:36*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2021 13:36*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21040695

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R381622 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21040695-11	16WW58-210413	13 Apr 2021 07:40			14 Apr 2021 15:43	1
HS21040695-12	16WW57-210413	13 Apr 2021 08:30			14 Apr 2021 16:38	5
HS21040695-13	16WW35-210413	13 Apr 2021 09:40			14 Apr 2021 16:56	5
HS21040695-14	16WW36-210413	13 Apr 2021 10:30			14 Apr 2021 17:15	5
Batch ID: R381715 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS21040695-11	16WW58-210413	13 Apr 2021 07:40			15 Apr 2021 21:34	1
HS21040695-12	16WW57-210413	13 Apr 2021 08:30			15 Apr 2021 21:56	1
HS21040695-13	16WW35-210413	13 Apr 2021 09:40			15 Apr 2021 22:05	1
HS21040695-14	16WW36-210413	13 Apr 2021 10:30			15 Apr 2021 22:12	1
Batch ID: R381732 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21040695-18	Trip Blank-210413	13 Apr 2021 00:00			15 Apr 2021 13:36	1
Batch ID: R381732 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21040695-01	16WW44-210412	12 Apr 2021 07:40			15 Apr 2021 13:57	1
HS21040695-03	16WW37-210412	12 Apr 2021 09:15			15 Apr 2021 14:18	1
Batch ID: R381740 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21040695-02	16WW38-210412	12 Apr 2021 08:30			16 Apr 2021 05:23	100
HS21040695-02	16WW38-210412	12 Apr 2021 08:30			16 Apr 2021 05:02	10
HS21040695-04	16WW14-210412	12 Apr 2021 10:00			15 Apr 2021 23:25	1
HS21040695-05	16WW34-210412	12 Apr 2021 10:45			16 Apr 2021 02:35	1
HS21040695-06	16WW34-210412-FD	12 Apr 2021 10:45			16 Apr 2021 02:56	1
HS21040695-07	16WW33-210412	12 Apr 2021 11:30			16 Apr 2021 03:17	1
HS21040695-08	16WW32-210412	12 Apr 2021 12:15			16 Apr 2021 03:38	1
HS21040695-09	16WW31-210412	12 Apr 2021 13:00			16 Apr 2021 03:59	1
HS21040695-10	16WW46-210412	12 Apr 2021 13:45			16 Apr 2021 04:20	1
HS21040695-12	16WW57-210413	13 Apr 2021 08:30			16 Apr 2021 04:41	1
HS21040695-13	16WW35-210413	13 Apr 2021 09:40			16 Apr 2021 06:05	100
HS21040695-13	16WW35-210413	13 Apr 2021 09:40			16 Apr 2021 05:44	10
HS21040695-14	16WW36-210413	13 Apr 2021 10:30			16 Apr 2021 06:47	250
HS21040695-14	16WW36-210413	13 Apr 2021 10:30			16 Apr 2021 06:26	25
HS21040695-15	16PM09-210413	13 Apr 2021 11:15			15 Apr 2021 23:46	1

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21040695

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R381840 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21040695-11	16WW58-210413	13 Apr 2021 07:40			16 Apr 2021 17:01	10
HS21040695-11	16WW58-210413	13 Apr 2021 07:40			16 Apr 2021 16:40	1
HS21040695-15	16PM09-210413	13 Apr 2021 11:15			16 Apr 2021 14:55	10
HS21040695-16	16PM06-210413	13 Apr 2021 12:05			16 Apr 2021 18:26	500
HS21040695-16	16PM06-210413	13 Apr 2021 12:05			16 Apr 2021 18:05	100
HS21040695-17	16PM14-210413	13 Apr 2021 12:50			16 Apr 2021 17:43	250
HS21040695-17	16PM14-210413	13 Apr 2021 12:50			16 Apr 2021 17:22	20
Batch ID: R382191 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS21040695-11	16WW58-210413	13 Apr 2021 07:40			21 Apr 2021 10:49	1
HS21040695-12	16WW57-210413	13 Apr 2021 08:30			21 Apr 2021 11:07	1
HS21040695-13	16WW35-210413	13 Apr 2021 09:40			21 Apr 2021 11:43	10
HS21040695-13	16WW35-210413	13 Apr 2021 09:40			21 Apr 2021 11:20	1
HS21040695-14	16WW36-210413	13 Apr 2021 10:30			21 Apr 2021 11:52	10
HS21040695-14	16WW36-210413	13 Apr 2021 10:30			21 Apr 2021 11:30	1
Batch ID: R382301 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS21040695-11	16WW58-210413	13 Apr 2021 07:40			23 Apr 2021 17:26	1
HS21040695-12	16WW57-210413	13 Apr 2021 08:30			23 Apr 2021 17:44	1
HS21040695-14	16WW36-210413	13 Apr 2021 10:30			23 Apr 2021 18:17	1
Batch ID: R382442 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21040695-11	16WW58-210413	13 Apr 2021 07:40			26 Apr 2021 19:05	10
HS21040695-12	16WW57-210413	13 Apr 2021 08:30			26 Apr 2021 19:24	50
HS21040695-13	16WW35-210413	13 Apr 2021 09:40			26 Apr 2021 19:42	500
HS21040695-14	16WW36-210413	13 Apr 2021 10:30			26 Apr 2021 20:00	50
Batch ID: R382505 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS21040695-13	16WW35-210413	13 Apr 2021 09:40			27 Apr 2021 17:43	10

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21040695

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R382774 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS21040695-01	16WW44-210412	12 Apr 2021 07:40			30 Apr 2021 15:53	1
HS21040695-02	16WW38-210412	12 Apr 2021 08:30			30 Apr 2021 15:53	1
HS21040695-03	16WW37-210412	12 Apr 2021 09:15			30 Apr 2021 15:53	1
HS21040695-04	16WW14-210412	12 Apr 2021 10:00			30 Apr 2021 15:53	1
HS21040695-05	16WW34-210412	12 Apr 2021 10:45			30 Apr 2021 15:53	1
HS21040695-06	16WW34-210412-FD	12 Apr 2021 10:45			30 Apr 2021 15:53	1
HS21040695-07	16WW33-210412	12 Apr 2021 11:30			30 Apr 2021 15:53	1
HS21040695-08	16WW32-210412	12 Apr 2021 12:15			30 Apr 2021 15:53	1
HS21040695-09	16WW31-210412	12 Apr 2021 13:00			30 Apr 2021 15:53	1
HS21040695-10	16WW46-210412	12 Apr 2021 13:45			30 Apr 2021 15:53	1
HS21040695-11	16WW58-210413	13 Apr 2021 07:40			30 Apr 2021 15:53	1
HS21040695-12	16WW57-210413	13 Apr 2021 08:30			30 Apr 2021 15:53	1
HS21040695-13	16WW35-210413	13 Apr 2021 09:40			30 Apr 2021 15:53	1
HS21040695-14	16WW36-210413	13 Apr 2021 10:30			30 Apr 2021 15:53	1
HS21040695-15	16PM09-210413	13 Apr 2021 11:15			30 Apr 2021 15:53	1
HS21040695-16	16PM06-210413	13 Apr 2021 12:05			30 Apr 2021 15:53	1
HS21040695-17	16PM14-210413	13 Apr 2021 12:50			30 Apr 2021 15:53	1

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21040695

QC BATCH REPORT

Batch ID: R382191 (0) **Instrument: FID-4** **Method: DISSOLVED GASES BY RSK-175**

MBLK Sample ID: **MBLK-210421** Units: **mg/L** Analysis Date: **21-Apr-2021 10:29**
Client ID: Run ID: **FID-4_382191** SeqNo: **6056346** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000500	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000500	0.000500								U

LCS Sample ID: **LCS-210421** Units: **mg/L** Analysis Date: **21-Apr-2021 10:40**
Client ID: Run ID: **FID-4_382191** SeqNo: **6056347** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0200	0.00100	0.01804	0	111	75 - 125				
Ethene	0.0182	0.00100	0.0168	0	109	75 - 125				
Methane	0.00918	0.000500	0.009647	0	95.2	75 - 125				

MS Sample ID: **HS21040859-08MS** Units: **mg/L** Analysis Date: **21-Apr-2021 13:01**
Client ID: Run ID: **FID-4_382191** SeqNo: **6056357** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0159	0.00100	0.01804	0	88.3	75 - 125				
Ethene	0.0157	0.00100	0.0168	0	93.6	75 - 125				
Methane	0.00746	0.000500	0.009647	0.001022	66.8	75 - 125				S

MSD Sample ID: **HS21040859-08MSD** Units: **mg/L** Analysis Date: **21-Apr-2021 13:46**
Client ID: Run ID: **FID-4_382191** SeqNo: **6056358** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0160	0.00100	0.01804	0	88.5	75 - 125	0.01594	0.166	30	
Ethene	0.0157	0.00100	0.0168	0	93.6	75 - 125	0.01573	0.0543	30	
Methane	0.00713	0.000500	0.009647	0.001022	63.3	75 - 125	0.007465	4.6	30	S

The following samples were analyzed in this batch: HS21040695-11 HS21040695-12 HS21040695-13 HS21040695-14

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21040695

QC BATCH REPORT

Batch ID: R381732 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210415** Units: **ug/L** Analysis Date: **15-Apr-2021 12:33**
Client ID: Run ID: **VOA6_381732** SeqNo: **6044650** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*47.58*	*1.0*	*50*	*0*	*95.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.47*	*1.0*	*50*	*0*	*96.9*	*85 - 114*				
Surr: Dibromofluoromethane	*45.89*	*1.0*	*50*	*0*	*91.8*	*80 - 119*				
Surr: Toluene-d8	*54.05*	*1.0*	*50*	*0*	*108*	*89 - 112*				

LCS Sample ID: **VLCSW-210415** Units: **ug/L** Analysis Date: **15-Apr-2021 11:46**
Client ID: Run ID: **VOA6_381732** SeqNo: **6044649** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	21.31	1.0	20	0	107	80 - 119				
1,1-Dichloroethene	19.27	1.0	20	0	96.3	71 - 131				
1,2-Dichloroethane	19.73	1.0	20	0	98.7	73 - 128				
cis-1,2-Dichloroethene	19.75	1.0	20	0	98.8	78 - 123				
Methylene chloride	20.27	2.0	20	0	101	74 - 124				
Trichloroethene	19.63	1.0	20	0	98.1	79 - 123				
Vinyl chloride	21.06	1.0	20	0	105	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.26*	*1.0*	*50*	*0*	*105*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.34*	*1.0*	*50*	*0*	*98.7*	*85 - 114*				
Surr: Dibromofluoromethane	*49.39*	*1.0*	*50*	*0*	*98.8*	*80 - 119*				
Surr: Toluene-d8	*48.99*	*1.0*	*50*	*0*	*98.0*	*89 - 112*				

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21040695

QC BATCH REPORT

Batch ID: R381732 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21040695-01MS** Units: **ug/L** Analysis Date: **15-Apr-2021 16:03**
Client ID: **16WW44-210412** Run ID: **VOA6_381732** SeqNo: **6044722** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.95	1.0	20	0	99.8	80 - 119				
1,1-Dichloroethene	18.58	1.0	20	0	92.9	71 - 131				
1,2-Dichloroethane	19.61	1.0	20	0	98.1	73 - 128				
cis-1,2-Dichloroethene	17.87	1.0	20	0	89.4	78 - 123				
Methylene chloride	18.27	2.0	20	0	91.3	74 - 124				
Trichloroethene	20.35	1.0	20	0	102	79 - 123				
Vinyl chloride	19.82	1.0	20	0	99.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*47.48*	*1.0*	*50*	*0*	*95.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.54*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*46.01*	*1.0*	*50*	*0*	*92.0*	*80 - 119*				
Surr: Toluene-d8	*51.71*	*1.0*	*50*	*0*	*103*	*89 - 112*				

MSD Sample ID: **HS21040695-01MSD** Units: **ug/L** Analysis Date: **15-Apr-2021 16:24**
Client ID: **16WW44-210412** Run ID: **VOA6_381732** SeqNo: **6044723** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.24	1.0	20	0	101	80 - 119	19.95	1.41	20	
1,1-Dichloroethene	18.09	1.0	20	0	90.5	71 - 131	18.58	2.66	20	
1,2-Dichloroethane	19.14	1.0	20	0	95.7	73 - 128	19.61	2.46	20	
cis-1,2-Dichloroethene	18.01	1.0	20	0	90.0	78 - 123	17.87	0.763	20	
Methylene chloride	18.63	2.0	20	0	93.2	74 - 124	18.27	1.98	20	
Trichloroethene	19.92	1.0	20	0	99.6	79 - 123	20.35	2.12	20	
Vinyl chloride	18.53	1.0	20	0	92.7	58 - 137	19.82	6.72	20	
Surr: 1,2-Dichloroethane-d4	*49.91*	*1.0*	*50*	*0*	*99.8*	*81 - 118*	*47.48*	*4.99*	*20*	
Surr: 4-Bromofluorobenzene	*49.7*	*1.0*	*50*	*0*	*99.4*	*85 - 114*	*50.54*	*1.66*	*20*	
Surr: Dibromofluoromethane	*47.33*	*1.0*	*50*	*0*	*94.7*	*80 - 119*	*46.01*	*2.84*	*20*	
Surr: Toluene-d8	*52.29*	*1.0*	*50*	*0*	*105*	*89 - 112*	*51.71*	*1.1*	*20*	

The following samples were analyzed in this batch: HS21040695-01 HS21040695-03 HS21040695-18

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21040695

QC BATCH REPORT

Batch ID: R381740 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210415** Units: **ug/L** Analysis Date: **15-Apr-2021 23:04**
Client ID: Run ID: **VOA6_381740** SeqNo: **6044795** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*50.13*	*1.0*	*50*	*0*	*100*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.78*	*1.0*	*50*	*0*	*97.6*	*85 - 114*				
Surr: Dibromofluoromethane	*47.28*	*1.0*	*50*	*0*	*94.6*	*80 - 119*				
Surr: Toluene-d8	*54.54*	*1.0*	*50*	*0*	*109*	*89 - 112*				

LCS Sample ID: **VLCSW-210415** Units: **ug/L** Analysis Date: **15-Apr-2021 22:22**
Client ID: Run ID: **VOA6_381740** SeqNo: **6044794** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	21.17	1.0	20	0	106	80 - 119				
1,1-Dichloroethene	20.55	1.0	20	0	103	71 - 131				
1,2-Dichloroethane	20.76	1.0	20	0	104	73 - 128				
cis-1,2-Dichloroethene	21.01	1.0	20	0	105	78 - 123				
Methylene chloride	22.15	2.0	20	0	111	74 - 124				
Trichloroethene	20.8	1.0	20	0	104	79 - 123				
Vinyl chloride	22.36	1.0	20	0	112	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.45*	*1.0*	*50*	*0*	*105*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.54*	*1.0*	*50*	*0*	*97.1*	*85 - 114*				
Surr: Dibromofluoromethane	*48*	*1.0*	*50*	*0*	*96.0*	*80 - 119*				
Surr: Toluene-d8	*47.54*	*1.0*	*50*	*0*	*95.1*	*89 - 112*				

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21040695

QC BATCH REPORT

Batch ID: R381740 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21040695-04MS** Units: **ug/L** Analysis Date: **16-Apr-2021 00:07**
Client ID: **16WW14-210412** Run ID: **VOA6_381740** SeqNo: **6044798** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	21.53	1.0	20	0	108	80 - 119				
1,1-Dichloroethene	19.93	1.0	20	0	99.6	71 - 131				
1,2-Dichloroethane	19.94	1.0	20	0	99.7	73 - 128				
cis-1,2-Dichloroethene	20.79	1.0	20	0	104	78 - 123				
Methylene chloride	19.62	2.0	20	0	98.1	74 - 124				
Trichloroethene	40.1	1.0	20	16.8	116	79 - 123				
Vinyl chloride	19.87	1.0	20	0	99.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*49.68*	*1.0*	*50*	*0*	*99.4*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.47*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*46.31*	*1.0*	*50*	*0*	*92.6*	*80 - 119*				
Surr: Toluene-d8	*50.88*	*1.0*	*50*	*0*	*102*	*89 - 112*				

MSD Sample ID: **HS21040695-04MSD** Units: **ug/L** Analysis Date: **16-Apr-2021 00:28**
Client ID: **16WW14-210412** Run ID: **VOA6_381740** SeqNo: **6044799** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.92	1.0	20	0	99.6	80 - 119	21.53	7.78	20	
1,1-Dichloroethene	18.21	1.0	20	0	91.1	71 - 131	19.93	8.98	20	
1,2-Dichloroethane	19.34	1.0	20	0	96.7	73 - 128	19.94	3.09	20	
cis-1,2-Dichloroethene	19.43	1.0	20	0	97.1	78 - 123	20.79	6.78	20	
Methylene chloride	19.54	2.0	20	0	97.7	74 - 124	19.62	0.399	20	
Trichloroethene	36.64	1.0	20	16.8	99.2	79 - 123	40.1	9.01	20	
Vinyl chloride	17.78	1.0	20	0	88.9	58 - 137	19.87	11.1	20	
Surr: 1,2-Dichloroethane-d4	*48.33*	*1.0*	*50*	*0*	*96.7*	*81 - 118*	*49.68*	*2.75*	*20*	
Surr: 4-Bromofluorobenzene	*51.38*	*1.0*	*50*	*0*	*103*	*85 - 114*	*50.47*	*1.8*	*20*	
Surr: Dibromofluoromethane	*46.96*	*1.0*	*50*	*0*	*93.9*	*80 - 119*	*46.31*	*1.4*	*20*	
Surr: Toluene-d8	*52.48*	*1.0*	*50*	*0*	*105*	*89 - 112*	*50.88*	*3.1*	*20*	

The following samples were analyzed in this batch:

HS21040695-02	HS21040695-04	HS21040695-05	HS21040695-06
HS21040695-07	HS21040695-08	HS21040695-09	HS21040695-10
HS21040695-12	HS21040695-13	HS21040695-14	HS21040695-15

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21040695

QC BATCH REPORT

Batch ID: R381840 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210416** Units: **ug/L** Analysis Date: **16-Apr-2021 12:28**
Client ID: Run ID: **VOA6_381840** SeqNo: **6047675** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*48.72*	*1.0*	*50*	*0*	*97.4*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.23*	*1.0*	*50*	*0*	*94.5*	*85 - 114*				
Surr: Dibromofluoromethane	*45.6*	*1.0*	*50*	*0*	*91.2*	*80 - 119*				
Surr: Toluene-d8	*54.35*	*1.0*	*50*	*0*	*109*	*89 - 112*				

LCS Sample ID: **VLCSW-210416** Units: **ug/L** Analysis Date: **16-Apr-2021 11:45**
Client ID: Run ID: **VOA6_381840** SeqNo: **6047674** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.78	1.0	20	0	104	80 - 119				
1,1-Dichloroethene	18.83	1.0	20	0	94.2	71 - 131				
1,2-Dichloroethane	20.86	1.0	20	0	104	73 - 128				
cis-1,2-Dichloroethene	20.48	1.0	20	0	102	78 - 123				
Methylene chloride	22.5	2.0	20	0	112	74 - 124				
Trichloroethene	20.12	1.0	20	0	101	79 - 123				
Vinyl chloride	20.76	1.0	20	0	104	58 - 137				
Surr: 1,2-Dichloroethane-d4	*51.04*	*1.0*	*50*	*0*	*102*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.14*	*1.0*	*50*	*0*	*100*	*85 - 114*				
Surr: Dibromofluoromethane	*48.54*	*1.0*	*50*	*0*	*97.1*	*80 - 119*				
Surr: Toluene-d8	*46.71*	*1.0*	*50*	*0*	*93.4*	*89 - 112*				

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21040695

QC BATCH REPORT

Batch ID: R381840 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS21040768-09MS** Units: **ug/L** Analysis Date: **16-Apr-2021 15:37**
Client ID: Run ID: **VOA6_381840** SeqNo: **6047684** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	21.29	1.0	20	0	106	80 - 119				
1,1-Dichloroethene	20.21	1.0	20	0	101	71 - 131				
1,2-Dichloroethane	20.45	1.0	20	0	102	73 - 128				
cis-1,2-Dichloroethene	20.29	1.0	20	0	101	78 - 123				
Methylene chloride	20.7	2.0	20	0	104	74 - 124				
Trichloroethene	23.91	1.0	20	0.6216	116	79 - 123				
Vinyl chloride	20.32	1.0	20	0	102	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.4*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.08*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*46.89*	*1.0*	*50*	*0*	*93.8*	*80 - 119*				
Surr: Toluene-d8	*52.29*	*1.0*	*50*	*0*	*105*	*89 - 112*				

MSD Sample ID: **HS21040768-09MSD** Units: **ug/L** Analysis Date: **16-Apr-2021 15:58**
Client ID: Run ID: **VOA6_381840** SeqNo: **6047685** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.96	1.0	20	0	99.8	80 - 119	21.29	6.44	20	
1,1-Dichloroethene	20.01	1.0	20	0	100	71 - 131	20.21	0.98	20	
1,2-Dichloroethane	20.16	1.0	20	0	101	73 - 128	20.45	1.43	20	
cis-1,2-Dichloroethene	19	1.0	20	0	95.0	78 - 123	20.29	6.57	20	
Methylene chloride	20.22	2.0	20	0	101	74 - 124	20.7	2.32	20	
Trichloroethene	21.8	1.0	20	0.6216	106	79 - 123	23.91	9.22	20	
Vinyl chloride	19.92	1.0	20	0	99.6	58 - 137	20.32	1.99	20	
Surr: 1,2-Dichloroethane-d4	*49.49*	*1.0*	*50*	*0*	*99.0*	*81 - 118*	*50.4*	*1.82*	*20*	
Surr: 4-Bromofluorobenzene	*51.91*	*1.0*	*50*	*0*	*104*	*85 - 114*	*52.08*	*0.344*	*20*	
Surr: Dibromofluoromethane	*46.31*	*1.0*	*50*	*0*	*92.6*	*80 - 119*	*46.89*	*1.26*	*20*	
Surr: Toluene-d8	*50.98*	*1.0*	*50*	*0*	*102*	*89 - 112*	*52.29*	*2.54*	*20*	

The following samples were analyzed in this batch: HS21040695-11 HS21040695-15 HS21040695-16 HS21040695-17

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21040695

QC BATCH REPORT

Batch ID: R381622 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **14-Apr-2021 09:53**
Client ID: Run ID: **ICS-Integrion_381622** SeqNo: **6042101** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **14-Apr-2021 10:11**
Client ID: Run ID: **ICS-Integrion_381622** SeqNo: **6042144** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.686	0.100	4	0	92.1	80 - 120				
Nitrogen, Nitrate (As N)	3.931	0.100	4	0	98.3	80 - 120				

MS Sample ID: **HS21040695-11MS** Units: **mg/L** Analysis Date: **14-Apr-2021 16:01**
Client ID: **16WW58-210413** Run ID: **ICS-Integrion_381622** SeqNo: **6042108** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	4.58	0.100	2	2.502	104	80 - 120				
Nitrogen, Nitrate (As N)	2.13	0.100	2	0	107	80 - 120				

MS Sample ID: **HS21040110-06MS** Units: **mg/L** Analysis Date: **15-Apr-2021 05:13**
Client ID: Run ID: **ICS-Integrion_381622** SeqNo: **6042132** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	8.478	0.100	2	6.484	99.7	80 - 120				
Nitrogen, Nitrate (As N)	2.163	0.100	2	0.1416	101	80 - 120				

MSD Sample ID: **HS21040695-11MSD** Units: **mg/L** Analysis Date: **14-Apr-2021 16:19**
Client ID: **16WW58-210413** Run ID: **ICS-Integrion_381622** SeqNo: **6042109** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	4.571	0.100	2	2.502	103	80 - 120	4.58	0.19	20	
Nitrogen, Nitrate (As N)	2.138	0.100	2	0	107	80 - 120	2.13	0.356	20	

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21040695

QC BATCH REPORT

Batch ID: R381622 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS21040110-06MSD** Units: **mg/L** Analysis Date: **15-Apr-2021 05:31**
Client ID: Run ID: **ICS-Integrion_381622** SeqNo: **6042133** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	8.466	0.100	2	6.484	99.1	80 - 120	8.478	0.145	20	
Nitrogen, Nitrate (As N)	2.155	0.100	2	0.1416	101	80 - 120	2.163	0.375	20	

The following samples were analyzed in this batch: HS21040695-11 HS21040695-12 HS21040695-13 HS21040695-14

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21040695

QC BATCH REPORT

Batch ID: R381715 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM2320B**

MBLK Sample ID: **WBLKW1-210415** Units: **mg/L** Analysis Date: **15-Apr-2021 18:58**
Client ID: Run ID: **ManTech01_381715** SeqNo: **6044112** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **LCS1-210415** Units: **mg/L** Analysis Date: **15-Apr-2021 19:07**
Client ID: Run ID: **ManTech01_381715** SeqNo: **6044113** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1004	5.00	1000	0	100	85 - 115				

LCSD Sample ID: **LCSD1-210415** Units: **mg/L** Analysis Date: **15-Apr-2021 19:15**
Client ID: Run ID: **ManTech01_381715** SeqNo: **6044114** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1007	5.00	1000	0	101	85 - 115	1004	0.304	20	

DUP Sample ID: **HS21040756-02DUP** Units: **mg/L** Analysis Date: **15-Apr-2021 19:29**
Client ID: Run ID: **ManTech01_381715** SeqNo: **6044116** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	131.1	5.00					130.7	0.29	20	

The following samples were analyzed in this batch: HS21040695-11 HS21040695-12 HS21040695-13 HS21040695-14

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21040695

QC BATCH REPORT

Batch ID: R382301 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **MBLK-04232021** Units: **mg/L** Analysis Date: **23-Apr-2021 14:24**
Client ID: Run ID: **TOC_04_382301** SeqNo: **6059258** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	0.500	1.00								U

LCS Sample ID: **LCS-04232021** Units: **mg/L** Analysis Date: **23-Apr-2021 14:39**
Client ID: Run ID: **TOC_04_382301** SeqNo: **6059259** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.735	1.00	10	0	97.4	85 - 115				

LCSD Sample ID: **LCSD-04232021** Units: **mg/L** Analysis Date: **23-Apr-2021 14:55**
Client ID: Run ID: **TOC_04_382301** SeqNo: **6059260** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.11	1.00	10	0	101	85 - 115	9.735	3.78	20	

MS Sample ID: **HS21040940-01MS** Units: **mg/L** Analysis Date: **23-Apr-2021 15:56**
Client ID: Run ID: **TOC_04_382301** SeqNo: **6059264** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	17.19	1.00	10	6.891	103	80 - 120				

The following samples were analyzed in this batch: HS21040695-11 HS21040695-12 HS21040695-14

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21040695

QC BATCH REPORT

Batch ID: R382442 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **26-Apr-2021 13:29**
Client ID: Run ID: **ICS-Integrion_382442** SeqNo: **6062803** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **26-Apr-2021 13:47**
Client ID: Run ID: **ICS-Integrion_382442** SeqNo: **6062804** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	19.02	0.500	20	0	95.1	80 - 120				

MS Sample ID: **HS21040612-07MS** Units: **mg/L** Analysis Date: **26-Apr-2021 18:28**
Client ID: Run ID: **ICS-Integrion_382442** SeqNo: **6062809** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	105.3	5.00	100	2.028	103	80 - 120				

MSD Sample ID: **HS21040612-07MSD** Units: **mg/L** Analysis Date: **26-Apr-2021 18:47**
Client ID: Run ID: **ICS-Integrion_382442** SeqNo: **6062810** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	103.3	5.00	100	2.028	101	80 - 120	105.3	1.85	20	

The following samples were analyzed in this batch: HS21040695-11 HS21040695-12 HS21040695-13 HS21040695-14

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21040695

QC BATCH REPORT

Batch ID: R382505 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **MBLK-04272021** Units: **mg/L** Analysis Date: **27-Apr-2021 16:58**
Client ID: Run ID: **TOC_04_382505** SeqNo: **6063982** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	0.500	1.00								U

LCS Sample ID: **LCS-04272021** Units: **mg/L** Analysis Date: **27-Apr-2021 17:14**
Client ID: Run ID: **TOC_04_382505** SeqNo: **6063983** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.152	1.00	10	0	91.5	85 - 115				

LCSD Sample ID: **LCSD-04272021** Units: **mg/L** Analysis Date: **27-Apr-2021 17:29**
Client ID: Run ID: **TOC_04_382505** SeqNo: **6063984** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.77	1.00	10	0	97.7	85 - 115	9.152	6.53	20	

MS Sample ID: **HS21040859-08MS** Units: **mg/L** Analysis Date: **27-Apr-2021 19:32**
Client ID: Run ID: **TOC_04_382505** SeqNo: **6063991** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	11.87	1.00	10	1.798	101	80 - 120				

The following samples were analyzed in this batch: HS21040695-13

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: **HS21040695**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

ALS Houston, US Date: 30-Apr-21

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	21-022-0	26-Mar-2022
California	2919, 2020-2021	01-May-2021
Dept of Defense	PJLA L20-507-R2	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2020-2021	01-May-2021
Kentucky	123043, 2021-2022	01-May-2022
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2021	31-Dec-2021
North Dakota	R-193 2020-2021	01-May-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-21-27	30-Apr-2022

ALS Houston, US Date: 30-Apr-21

Sample Receipt Checklist

Work Order ID: HS21040695 **Date/Time Received:** **14-Apr-2021 09:45**

Client Name: CBI-Houston **Received by:** **Pablo Marinez**

Completed By: */S/ Paresh M. Giga* (eSignature) 14-Apr-2021 13:12 (Date/Time) **Reviewed by:** */S/ RJ Modashia* (eSignature) 15-Apr-2021 08:58 (Date/Time)

Matrices: **GW/Water** Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	3 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	0.9C U/C	IR31
Cooler(s)/Kit(s):	46489	
Date/Time sample(s) sent to storage:	4/14/2021 13:45	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

01155184

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: RJ Modashia

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 501032
Job: **LHAAP 16 April 2021**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	
16ww44-210412	WG	4/12/21/0740		4	X					X						
16ww38-210412	WG	4/12/21/0830		4	X					X						
16ww37-210412	WG	4/12/21/0915		4	X					X						
16ww14-210412	WG	4/12/21/1000		4	X					X						
16ww34-210412	WG	4/12/21/1045		4	X					X						
16ww34-210412-FD	WG	4/12/21/1045		4	X					X						
16ww33-210412	WG	4/12/21/1130		4	X					X						
16ww32-210412	WG	4/12/21/1215		4	X					X						

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	4/13/21	1430	Patt Mc	4/14/21	9:45						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

46484 0.9 C IR31 CFO

(Word) S:\Forms\Chain of Custody - BiWeekly

HS21040695

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant 16 April 2021

01155185

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: RJ Modashia

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 501032
Job: **LHAAP 16 April 2021**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16WW31-210412	WG	4/12/21/1300		4	X					X					
16WW46-210412	WG	4/12/21/1345		4	X					X					
16 WW58-210413	WG	4/13/21/0740		10	X	X	X	X	X	X					
16WW57-210413	WG	4/13/21/0830		10	X	X	X	X	X	X					
16WW35-210413	WG	4/13/21/0940		10	X	X	X	X	X	X					
16WW36-210413	WG	4/13/21/1030		10	X	X	X	X	X	X					
16PM09-210413	WG	4/13/21/1115		4	X					X					
16PM06-210413	WG	4/13/21/1205		4	X					X					

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	4/13/21	1430	Paul Mann	4/14/21	0745						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

(Word) S:\H-ces\Forms\Chain of Custody - BiWeekly

HS21040695

Aptim Environmental & Infrastructure, Inc.
Longhorn Army Ammunition Plant 16 April 2021

01155186

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Project: APTIM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 16 April 2021**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16PM14-210413	W6	4/13/21/1250		4	X					X					
TRIPBLANK-210413	W	4/13/21		2	X										

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	4/13/21	1430	Paul Mann	4-14-21	9:45						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

Aptim Environmental & Infrastructure, Inc.
Longhorn Army Ammunition Plant 16 April 2021

HS21040695

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

46489

CUSTODY SEAL

Date: 4/13/21 Time: 1430
Name: Scott Beesinger
Company: Bhmts

Seal Broken By:
Date: 04/14/21

46489 APR 14 2021

Next Business Day
and Tempature Sensitive!

46489

ORIGIN ID:SGRA (903) 930-6113
SCOTT BEESINGER
APTIM ENVIRONMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
PMB 209
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 29MAR21
ACTWGT: 1.00 LB MAN
CAD: 0221247/CAFE3409
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-80 77443-RJ

RMA:

FedEx Express

WED - 14 APR AA
PRIORITY OVERNIGHT

TRK# 0221 9473 0841 7465

77099
TX-US
IAH

AB SGRA

April 30, 2021 Service Request No:E2100412

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: HS21040695

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory April 14, 2021
For your reference, these analyses have been assigned our service request number **E2100412.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100412
Project:	HS21040695	**Date Received:**	04/14/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Seventeen samples were received for analysis at ALS Environmental in Houston on 04/14/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100213 & EQ2100244: Laboratory Control Spike/Duplicate Laboratory Control Spike recoveries are within QC limits. EQ2100244 MS/MSD was performed on an unrelated sample. EQ2100213 LCS/LCSD reported in lieu of MS/MSD.

DoD certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2100412
Project: HS21040695

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100412-001	16WW44-210412	4/12/2021	0740
E2100412-002	16WW38-210412	4/12/2021	0830
E2100412-003	16WW37-210412	4/12/2021	0915
E2100412-004	16WW14-210412	4/12/2021	1000
E2100412-005	16WW34-210412	4/12/2021	1045
E2100412-006	16WW34-210412-FD	4/12/2021	1045
E2100412-007	16WW33-210412	4/12/2021	1130
E2100412-008	16WW32-210412	4/12/2021	1215
E2100412-009	16WW31-210412	4/12/2021	1300
E2100412-010	16WW46-210412	4/12/2021	1345
E2100412-011	16WW58-210413	4/13/2021	0740
E2100412-012	16WW57-210413	4/13/2021	0830
E2100412-013	16WW35-210413	4/13/2021	0940
E2100412-014	16WW36-210413	4/13/2021	1030
E2100412-015	16PM09-210413	4/13/2021	1115
E2100412-016	16PM06-210413	4/13/2021	1205
E2100412-017	16PM14-210413	4/13/2021	1250

Service Request Summary

Folder #: **E2100412**
Client Name: ALS Environmental - US
Project Name: HS21040695
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 04/14/21
Internal Due Date: 4/28/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21040695
EDD: No EDD Specified

17 125 mL-Plastic Bottle Plastic
Location: EHRMS-WIC 3B
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100412-001	16WW44-210412	Ground Water	04/12/21 0740	**IV**
E2100412-002	16WW38-210412	Ground Water	04/12/21 0830	**IV**
E2100412-003	16WW37-210412	Ground Water	04/12/21 0915	**IV**
E2100412-004	16WW14-210412	Ground Water	04/12/21 1000	**IV**
E2100412-005	16WW34-210412	Ground Water	04/12/21 1045	**IV**
E2100412-006	16WW34-210412-FD	Ground Water	04/12/21 1045	**IV**
E2100412-007	16WW33-210412	Ground Water	04/12/21 1130	**IV**
E2100412-008	16WW32-210412	Ground Water	04/12/21 1215	**IV**
E2100412-009	16WW31-210412	Ground Water	04/12/21 1300	**IV**
E2100412-010	16WW46-210412	Ground Water	04/12/21 1345	**IV**
E2100412-011	16WW58-210413	Ground Water	04/13/21 0740	**IV**
E2100412-012	16WW57-210413	Ground Water	04/13/21 0830	**IV**
E2100412-013	16WW35-210413	Ground Water	04/13/21 0940	**IV**
E2100412-014	16WW36-210413	Ground Water	04/13/21 1030	**IV**
E2100412-015	16PM09-210413	Ground Water	04/13/21 1115	**IV**
E2100412-016	16PM06-210413	Ground Water	04/13/21 1205	**IV**

Service Request Summary

Folder #: **E2100412**
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Project Name: HS21040695
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ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
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Merged?: Y
Report to MDL?: Y
P.O. Number: HS21040695
EDD: No EDD Specified

17 125 mL-Plastic Bottle Plastic
Location: EHRMS-WIC 3B
Pressure Gas:

Service Request Summary

Folder #: **E2100412**
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Project Name: HS21040695
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
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17 125 mL-Plastic Bottle Plastic
Location: EHRMS-WIC 3B
Pressure Gas:

Service Request Summary

Folder #: **E2100412**
Client Name: ALS Environmental - US
Project Name: HS21040695
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Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
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Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21040695
EDD: No EDD Specified

17 125 mL-Plastic Bottle Plastic
Location: EHRMS-WIC 3B
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	17	Level II due 4/28,IV due 5/5

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	21-022-0	3/26/2022
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Louisiana Department of Health and Hospitals	LA028-2021	12/31/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15934**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS21040695
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21040695-01**	**16WW44-210412**	**Groundwater**	**12 Apr 2021 07:40**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Apr 2021
2.	**HS21040695-02**	**16WW38-210412**	**Groundwater**	**12 Apr 2021 08:30**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Apr 2021
3.	**HS21040695-03**	**16WW37-210412**	**Groundwater**	**12 Apr 2021 09:15**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Apr 2021
4.	**HS21040695-04**	**16WW14-210412**	**Groundwater**	**12 Apr 2021 10:00**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Apr 2021
5.	**HS21040695-05**	**16WW34-210412**	**Groundwater**	**12 Apr 2021 10:45**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Apr 2021
6.	**HS21040695-06**	**16WW34-210412-FD**	**Groundwater**	**12 Apr 2021 10:45**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Apr 2021
7.	**HS21040695-07**	**16WW33-210412**	**Groundwater**	**12 Apr 2021 11:30**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Apr 2021
8.	**HS21040695-08**	**16WW32-210412**	**Groundwater**	**12 Apr 2021 12:15**

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15934**

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Apr 2021
9.	**HS21040695-09**	**16WW31-210412**	**Groundwater**	**12 Apr 2021 13:00**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Apr 2021
10.	**HS21040695-10**	**16WW46-210412**	**Groundwater**	**12 Apr 2021 13:45**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Apr 2021
11.	**HS21040695-11**	**16WW58-210413**	**Groundwater**	**13 Apr 2021 07:40**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Apr 2021
12.	**HS21040695-12**	**16WW57-210413**	**Groundwater**	**13 Apr 2021 08:30**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Apr 2021
13.	**HS21040695-13**	**16WW35-210413**	**Groundwater**	**13 Apr 2021 09:40**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Apr 2021
14.	**HS21040695-14**	**16WW36-210413**	**Groundwater**	**13 Apr 2021 10:30**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Apr 2021
15.	**HS21040695-15**	**16PM09-210413**	**Groundwater**	**13 Apr 2021 11:15**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Apr 2021
16.	**HS21040695-16**	**16PM06-210413**	**Groundwater**	**13 Apr 2021 12:05**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Apr 2021
17.	**HS21040695-17**	**16PM14-210413**	**Groundwater**	**13 Apr 2021 12:50**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Apr 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: _____

Received By: _____ Date/Time: 4/14/21 1415

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

Cooler Receipt Form

Project Chemist: CA

Client/Project: ALS-H

Thermometer ID: IR31

Date/Time Received: 9/14/21 Initials: CA

Date/Time Logged in: 9/14/21 Initials: CA

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ Courier (ALS) ○ Client

2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ✓ No
   Were they intact? ○ Yes ○ No ✓ N/A
   Were they signed and dated? ○ Yes ○ No ✓ N/A
   If yes, how many and where?

4. Packing Material: ○ Inserts ✓ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		9/14/21	1915	CA	3.9	☑
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No
10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 377530 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 4/15/21 11:50

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100409-001	LH18/24-SP650_041321_BIX	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2100410-001	LH18/24-SP140_041321	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2100411-001	LH18/24-SP650_041321_BIX	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2100412-001	16WW44-210412	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100412-002	16WW38-210412	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100412-003	16WW37-210412	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100412-004	16WW14-210412	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2100412-005	16WW34-210412	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2100412-006	16WW34-210412-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2100412-007	16WW33-210412	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2100412-008	16WW32-210412	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2100412-009	16WW31-210412	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2100412-010	16WW46-210412	.01	6850/ClO4 DOD			Ground Water	10mL	
14	EQ2100213-01	MB		6850/ClO4 DOD			Liquid	10mL	
15	EQ2100213-02	LCS		6850/ClO4 DOD			Liquid	10mL	
16	EQ2100213-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
17	R2103214-010	45MI20088	.14	6850/ClO4 DOD			Water	10mL	
18	R2103214-011	45MI30028	.06	6850/ClO4 DOD			Water	10mL	
19	R2103214-013	45MI30025	.06	6850/ClO4 DOD			Water	10mL	
20	R2103380-002	45MI30022	.05	6850/ClO4 DOD			Water	10mL	
21	R2103380-003	45MI30023	.05	6850/ClO4 DOD			Water	10mL	
22	R2103380-004	45MI30027	.05	6850/ClO4 DOD			Water	10mL	
23	R2103380-005	45MI30026	.05	6850/ClO4 DOD			Water	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100213-02	1.00µL	EQ2100213-03	1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100409-001	100.00µL	E2100410-001	100.00µL	E2100411-001	100.00µL	E2100412-001	100.00µL	E2100412-002	100.00µL	E2100412-003	100.00µL
E2100412-004	100.00µL	E2100412-005	100.00µL	E2100412-006	100.00µL	E2100412-007	100.00µL	E2100412-008	100.00µL	E2100412-009	100.00µL
E2100412-010	100.00µL	EQ2100213-01	100.00µL	EQ2100213-02	100.00µL	EQ2100213-03	100.00µL	R2103214-010	100.00µL	R2103214-011	100.00µL
R2103214-013	100.00µL	R2103380-002	100.00µL	R2103380-003	100.00µL	R2103380-004	100.00µL	R2103380-005	100.00µL		

Preparation Information Benchsheet

Prep Run#: 377530 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 4/15/21 11:50

Preparation Steps

Step: Preparation
Started: 4/15/21 11:50
Finished: 4/15/21 13:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 4/15/21

Chain of Custody

Relinquished By:		Date:		Extracts Examined
Received By:		Date:		Yes No

Preparation Information Benchsheet

Prep Run#: 378052 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 4/23/21 12:17

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100412-011	16WW58-210413	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2100412-012	16WW57-210413	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2100412-013	16WW35-210413	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2100412-014	16WW36-210413	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100412-015	16PM09-210413	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100412-016	16PM06-210413	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100412-017	16PM14-210413	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2100485-001	16PM02-210414	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2100485-002	16PM03-210414	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2100485-003	16PM03-210414-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2100485-004	16RW01-210414	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2100485-005	16RW04-210414	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2100485-006	16RW02-210414	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2100485-007	16WW16-210415	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2100485-008	16WW56-210415	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2100485-009	16WW22-210415	.01	6850/ClO4 DOD			Ground Water	10mL	
17	E2100485-010	16WW41-210415	.01	6850/ClO4 DOD			Ground Water	10mL	
18	E2100485-011	16WW21-210415	.01	6850/ClO4 DOD			Ground Water	10mL	
19	E2100485-012	16WW39-210415	.01	6850/ClO4 DOD			Ground Water	10mL	
20	E2100485-013	16WW51-210415	.01	6850/ClO4 DOD			Ground Water	10mL	
21	EQ2100244-01	MB		6850/ClO4 DOD			Liquid	10mL	
22	EQ2100244-02	LCS		6850/ClO4 DOD			Liquid	10mL	
23	EQ2100244-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
24	EQ2100244-04	16WW56-210415 MS	.01	6850/ClO4 DOD			Liquid	10mL	
25	EQ2100244-05	16WW56-210415 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100244-02	1.00µL	EQ2100244-03	1.00µL	EQ2100244-04	1.00µL	EQ2100244-05	1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100412-011	100.00µL	E2100412-012	100.00µL	E2100412-013	100.00µL	E2100412-014	100.00µL	E2100412-015	100.00µL	E2100412-016	100.00µL
E2100412-017	100.00µL	E2100485-001	100.00µL	E2100485-002	100.00µL	E2100485-003	100.00µL	E2100485-004	100.00µL	E2100485-005	100.00µL
E2100485-006	100.00µL	E2100485-007	100.00µL	E2100485-008	100.00µL	E2100485-009	100.00µL	E2100485-010	100.00µL	E2100485-011	100.00µL

Preparation Information Benchsheet

Prep Run#: 378052 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 4/23/21 12:17

E2100485-012	100.00µL	E2100485-013	100.00µL	EQ2100244-01	100.00µL	EQ2100244-02	100.00µL	EQ2100244-03	100.00µL	EQ2100244-04	100.00µL
EQ2100244-05	100.00µL										

Preparation Steps

Step: Preparation
Started: 4/23/21 12:17
Finished: 4/23/21 13:30
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 4/23/21

Chain of Custody

Relinquished By: _____ Date: _____

Received By: _____ Date: _____

Extracts Examined
Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
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ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	4/12/21 0740
Sample Matrix:	Ground Water	**Date Received:**	4/14/21
Sample Name:	16WW44-210412	**Units:**	µg/L
Lab Code:	E2100412-001	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.134**		0.100	0.0500	0.0250	1	4/15/21	4/29/21 12:16	377530	721582	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	4/12/21 0830
Sample Matrix:	Ground Water	**Date Received:**	4/14/21
Sample Name:	16WW38-210412	**Units:**	µg/L
Lab Code:	E2100412-002	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/15/21	4/20/21 14:20	377530	721439	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	4/12/21 0915
Sample Matrix:	Ground Water	**Date Received:**	4/14/21
Sample Name:	16WW37-210412	**Units:**	µg/L
Lab Code:	E2100412-003	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**1.60**		1.00	0.500	0.250	10	4/15/21	4/28/21 22:20	377530	721483	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	4/12/21 1000
Sample Matrix:	Ground Water	**Date Received:**	4/14/21
Sample Name:	16WW14-210412	**Units:**	µg/L
Lab Code:	E2100412-004	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/15/21	4/20/21 14:36	377530	721439	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	4/12/21 1045
Sample Matrix:	Ground Water	**Date Received:**	4/14/21
Sample Name:	16WW34-210412	**Units:**	µg/L
Lab Code:	E2100412-005	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/15/21	4/20/21 14:52	377530	721439	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	4/12/21 1045
Sample Matrix:	Ground Water	**Date Received:**	4/14/21
Sample Name:	16WW34-210412-FD	**Units:**	µg/L
Lab Code:	E2100412-006	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/15/21	4/20/21 15:00	377530	721439	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	4/12/21 1130
Sample Matrix:	Ground Water	**Date Received:**	4/14/21
Sample Name:	16WW33-210412	**Units:**	µg/L
Lab Code:	E2100412-007	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/15/21	4/20/21 15:08	377530	721439	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	4/12/21 1215
Sample Matrix:	Ground Water	**Date Received:**	4/14/21
Sample Name:	16WW32-210412	**Units:**	µg/L
Lab Code:	E2100412-008	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/15/21	4/20/21 15:16	377530	721439	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	4/12/21 1300
Sample Matrix:	Ground Water	**Date Received:**	4/14/21
Sample Name:	16WW31-210412	**Units:**	µg/L
Lab Code:	E2100412-009	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/15/21	4/20/21 15:23	377530	721439	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	4/12/21 1345
Sample Matrix:	Ground Water	**Date Received:**	4/14/21
Sample Name:	16WW46-210412	**Units:**	µg/L
Lab Code:	E2100412-010	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	4/15/21	4/28/21 22:29	377530	721483	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	4/13/21 0740
Sample Matrix:	Ground Water	**Date Received:**	4/14/21
Sample Name:	16WW58-210413	**Units:**	µg/L
Lab Code:	E2100412-011	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0348**	J	0.100	0.0500	0.0250	1	4/23/21	4/29/21 10:54	378052	721582	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	4/13/21 0830
Sample Matrix:	Ground Water	**Date Received:**	4/14/21
Sample Name:	16WW57-210413	**Units:**	µg/L
Lab Code:	E2100412-012	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.171**	J	0.500	0.250	0.125	5	4/23/21	4/29/21 16:10	378052	721582	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	4/13/21 0940
Sample Matrix:	Ground Water	**Date Received:**	4/14/21
Sample Name:	16WW35-210413	**Units:**	µg/L
Lab Code:	E2100412-013	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**367**		5.00	2.50	1.25	50	4/23/21	4/29/21 15:23	378052	721582	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	4/13/21 1030
Sample Matrix:	Ground Water	**Date Received:**	4/14/21
Sample Name:	16WW36-210413	**Units:**	µg/L
Lab Code:	E2100412-014	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**1.26**		0.100	0.0500	0.0250	1	4/23/21	4/29/21 10:44	378052	721582	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	4/13/21 1115
Sample Matrix:	Ground Water	**Date Received:**	4/14/21
Sample Name:	16PM09-210413	**Units:**	µg/L
Lab Code:	E2100412-015	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0355**	J	0.100	0.0500	0.0250	1	4/23/21	4/29/21 11:03	378052	721582	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	4/13/21 1205
Sample Matrix:	Ground Water	**Date Received:**	4/14/21
Sample Name:	16PM06-210413	**Units:**	µg/L
Lab Code:	E2100412-016	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	4/23/21	4/28/21 20:55	378052	721483	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	4/13/21 1250
Sample Matrix:	Ground Water	**Date Received:**	4/14/21
Sample Name:	16PM14-210413	**Units:**	µg/L
Lab Code:	E2100412-017	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.259**	J	1.00	0.500	0.250	10	4/23/21	4/28/21 21:05	378052	721483	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100213-01	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/15/21	4/20/21 13:25	377530	721439	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100244-01	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/23/21	4/28/21 20:27	378052	721483	

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Analyzed:**	4/20/21
Sample Matrix:	Ground Water		

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	As Received
		Extraction Lot:	377530

	Lab Control Sample EQ2100213-02			Duplicate Lab Control Sample EQ2100213-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.117	0.100	117	0.108	0.100	108	84 - 119	8	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100213-02	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.117**		0.100	0.0500	0.0250	1	4/15/21	4/20/21 13:33	377530	721439	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100213-03	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.108**		0.100	0.0500	0.0250	1	4/15/21	4/20/21 13:41	377530	721439	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21040695
Sample Matrix: Ground Water

Service Request: E2100412
Date Analyzed: 4/28/21

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Units: µg/L
Basis: As Received

Extraction Lot: 378052

	Lab Control Sample EQ2100244-02			Duplicate Lab Control Sample EQ2100244-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0857	0.100	86	0.0977	0.100	98	84 - 119	13	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100244-02	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0857**	J	0.100	0.0500	0.0250	1	4/23/21	4/28/21 20:37	378052	721483	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100412
Project:	HS21040695	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100244-03	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0977**	J	0.100	0.0500	0.0250	1	4/23/21	4/28/21 20:46	378052	721483	

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April 30, 2021

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS21040859**

Laboratory Results for: **Longhorn Army Ammunition Plant LHAAP 16 April 2021**

Dear Vicki Graves ,

ALS Environmental received 15 sample(s) on Apr 16, 2021 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
Work Order: HS21040859

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21040859-01	16PM02-210414	Groundwater		14-Apr-2021 10:30	16-Apr-2021 10:00	☐
HS21040859-02	16PM03-210414	Groundwater		14-Apr-2021 11:20	16-Apr-2021 10:00	☐
HS21040859-03	16PM03-210414-FD	Groundwater		14-Apr-2021 11:20	16-Apr-2021 10:00	☐
HS21040859-04	16RW01-210414	Groundwater		14-Apr-2021 12:10	16-Apr-2021 10:00	☐
HS21040859-05	16RW04-210414	Groundwater		14-Apr-2021 12:55	16-Apr-2021 10:00	☐
HS21040859-06	16RW02-210414	Groundwater		14-Apr-2021 13:40	16-Apr-2021 10:00	☐
HS21040859-07	16WW16-210415	Groundwater		15-Apr-2021 07:25	16-Apr-2021 10:00	☐
HS21040859-08	16WW56-210415	Groundwater		15-Apr-2021 08:15	16-Apr-2021 10:00	☐
HS21040859-09	16WW22-210415	Groundwater		15-Apr-2021 09:10	16-Apr-2021 10:00	☐
HS21040859-10	16WW41-210415	Groundwater		15-Apr-2021 10:00	16-Apr-2021 10:00	☐
HS21040859-11	16WW21-210415	Groundwater		15-Apr-2021 10:45	16-Apr-2021 10:00	☐
HS21040859-12	16WW39-210415	Groundwater		15-Apr-2021 11:30	16-Apr-2021 10:00	☐
HS21040859-13	16WW51-210415	Groundwater		15-Apr-2021 12:15	16-Apr-2021 10:00	☐
HS21040859-14	16EW07-210415	Groundwater		15-Apr-2021 13:00	16-Apr-2021 10:00	☐
HS21040859-15	Trip Blank - 210415	Water		14-Apr-2021 00:00	16-Apr-2021 10:00	☐

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
Work Order: HS21040859

Work Order Comments

- The analysis for Perchlorate was subcontracted our ALS Houston TX, High Resolution Lab. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R382191

Sample ID: 16WW56-210415 (HS21040859-08MS)

- The recovery of the Matrix Spike (MS) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS may be due to sample matrix interference.

Sample ID: 16WW56-210415 (HS21040859-08MSD)

- The recovery of the Matrix Spike Duplicate (MSD) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The failed recovery of the MSD may be due to sample matrix interference.

GCMS Volatiles by Method SW8260

Batch ID: R382069

Sample ID: 16EW07-210415 (HS21040859-14)

- Lowest practical dilution for sample HS21040859-14 due to matrix. Sample is oily.

Batch ID: R381929

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM5310B

Batch ID: R382505,R382565

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: R382498

Sample ID: 16WW41-210415 (HS21040859-10)

- Sample ran at 5X due to high concentration of Sulfate

Sample ID: 16WW56-210415 (HS21040859-08)

- Sample ran at 2X due to high concentration of Chloride

Batch ID: R382646,R382746

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM2320B

Batch ID: R382121

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21040859
Sample ID: 16PM02-210414 Lab ID:HS21040859-01
Collection Date: 14-Apr-2021 10:30 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	25	U	7.5	25	25	ug/L	25	19-Apr-2021 18:47
1,1-Dichloroethene	**27**		**5.0**	**12**	**25**	**ug/L**	25	19-Apr-2021 18:47
1,2-Dichloroethane	**14**	J	**5.0**	**12**	**25**	**ug/L**	25	19-Apr-2021 18:47
cis-1,2-Dichloroethene	**2,200**		**5.0**	**12**	**25**	**ug/L**	25	19-Apr-2021 18:47
Methylene chloride	50	U	10	50	50	ug/L	25	19-Apr-2021 18:47
Trichloroethene	**15,000**		**50**	**120**	**250**	**ug/L**	250	19-Apr-2021 19:08
Vinyl chloride	**40**		**5.0**	**12**	**25**	**ug/L**	25	19-Apr-2021 18:47
Surr: 1,2-Dichloroethane-d4	*96.8*			**0**	*81-118*	*%REC*	*25*	*19-Apr-2021 18:47*
Surr: 1,2-Dichloroethane-d4	*97.0*			**0**	*81-118*	*%REC*	*250*	*19-Apr-2021 19:08*
Surr: 4-Bromofluorobenzene	*92.1*			**0**	*85-114*	*%REC*	*25*	*19-Apr-2021 18:47*
Surr: 4-Bromofluorobenzene	*94.8*			**0**	*85-114*	*%REC*	*250*	*19-Apr-2021 19:08*
Surr: Dibromofluoromethane	*92.1*			**0**	*80-119*	*%REC*	*250*	*19-Apr-2021 19:08*
Surr: Dibromofluoromethane	*91.9*			**0**	*80-119*	*%REC*	*25*	*19-Apr-2021 18:47*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*25*	*19-Apr-2021 18:47*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*250*	*19-Apr-2021 19:08*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21040859
Sample ID: 16PM03-210414 Lab ID:HS21040859-02
Collection Date: 14-Apr-2021 11:20 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	25	U	7.5	25	25	ug/L	25	19-Apr-2021 19:29
1,1-Dichloroethene	**37**		**5.0**	**12**	**25**	**ug/L**	25	19-Apr-2021 19:29
1,2-Dichloroethane	**23**	J	**5.0**	**12**	**25**	**ug/L**	25	19-Apr-2021 19:29
cis-1,2-Dichloroethene	**6,800**		**50**	**120**	**250**	**ug/L**	250	19-Apr-2021 19:50
Methylene chloride	50	U	10	50	50	ug/L	25	19-Apr-2021 19:29
Trichloroethene	**8,800**		**50**	**120**	**250**	**ug/L**	250	19-Apr-2021 19:50
Vinyl chloride	**220**		**5.0**	**12**	**25**	**ug/L**	25	19-Apr-2021 19:29
Surr: 1,2-Dichloroethane-d4	*97.6*			**0**	*81-118*	*%REC*	*25*	*19-Apr-2021 19:29*
Surr: 1,2-Dichloroethane-d4	*96.5*			**0**	*81-118*	*%REC*	*250*	*19-Apr-2021 19:50*
Surr: 4-Bromofluorobenzene	*95.3*			**0**	*85-114*	*%REC*	*25*	*19-Apr-2021 19:29*
Surr: 4-Bromofluorobenzene	*95.2*			**0**	*85-114*	*%REC*	*250*	*19-Apr-2021 19:50*
Surr: Dibromofluoromethane	*94.2*			**0**	*80-119*	*%REC*	*25*	*19-Apr-2021 19:29*
Surr: Dibromofluoromethane	*92.7*			**0**	*80-119*	*%REC*	*250*	*19-Apr-2021 19:50*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*250*	*19-Apr-2021 19:50*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*25*	*19-Apr-2021 19:29*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21040859
Sample ID: 16PM03-210414-FD Lab ID:HS21040859-03
Collection Date: 14-Apr-2021 11:20 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	25	U	7.5	25	25	ug/L	25	19-Apr-2021 20:12
1,1-Dichloroethene	**37**		**5.0**	**12**	**25**	**ug/L**	25	19-Apr-2021 20:12
1,2-Dichloroethane	**23**	J	**5.0**	**12**	**25**	**ug/L**	25	19-Apr-2021 20:12
cis-1,2-Dichloroethene	**7,100**		**50**	**120**	**250**	**ug/L**	250	19-Apr-2021 20:33
Methylene chloride	50	U	10	50	50	ug/L	25	19-Apr-2021 20:12
Trichloroethene	**9,000**		**50**	**120**	**250**	**ug/L**	250	19-Apr-2021 20:33
Vinyl chloride	**240**		**5.0**	**12**	**25**	**ug/L**	25	19-Apr-2021 20:12
Surr: 1,2-Dichloroethane-d4	*100*			**0**	*81-118*	*%REC*	*25*	*19-Apr-2021 20:12*
Surr: 1,2-Dichloroethane-d4	*98.4*			**0**	*81-118*	*%REC*	*250*	*19-Apr-2021 20:33*
Surr: 4-Bromofluorobenzene	*96.4*			**0**	*85-114*	*%REC*	*25*	*19-Apr-2021 20:12*
Surr: 4-Bromofluorobenzene	*95.2*			**0**	*85-114*	*%REC*	*250*	*19-Apr-2021 20:33*
Surr: Dibromofluoromethane	*95.4*			**0**	*80-119*	*%REC*	*25*	*19-Apr-2021 20:12*
Surr: Dibromofluoromethane	*93.0*			**0**	*80-119*	*%REC*	*250*	*19-Apr-2021 20:33*
Surr: Toluene-d8	*110*			**0**	*89-112*	*%REC*	*25*	*19-Apr-2021 20:12*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*250*	*19-Apr-2021 20:33*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21040859
Sample ID: 16RW01-210414 Lab ID:HS21040859-04
Collection Date: 14-Apr-2021 12:10 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	19-Apr-2021 18:05
1,1-Dichloroethene	5.0	U	2.0	5.0	10	ug/L	10	19-Apr-2021 18:05
1,2-Dichloroethane	5.0	U	2.0	5.0	10	ug/L	10	19-Apr-2021 18:05
cis-1,2-Dichloroethene	**130**		**2.0**	**5.0**	**10**	**ug/L**	10	19-Apr-2021 18:05
Methylene chloride	20	U	4.0	20	20	ug/L	10	19-Apr-2021 18:05
Trichloroethene	**3,000**		**20**	**50**	**100**	**ug/L**	100	19-Apr-2021 18:26
Vinyl chloride	5.0	U	2.0	5.0	10	ug/L	10	19-Apr-2021 18:05
Surr: 1,2-Dichloroethane-d4	*98.5*			**0**	*81-118*	*%REC*	*10*	*19-Apr-2021 18:05*
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*100*	*19-Apr-2021 18:26*
Surr: 4-Bromofluorobenzene	*97.1*			**0**	*85-114*	*%REC*	*10*	*19-Apr-2021 18:05*
Surr: 4-Bromofluorobenzene	*95.6*			**0**	*85-114*	*%REC*	*100*	*19-Apr-2021 18:26*
Surr: Dibromofluoromethane	*93.5*			**0**	*80-119*	*%REC*	*10*	*19-Apr-2021 18:05*
Surr: Dibromofluoromethane	*95.4*			**0**	*80-119*	*%REC*	*100*	*19-Apr-2021 18:26*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*10*	*19-Apr-2021 18:05*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*100*	*19-Apr-2021 18:26*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21040859
Sample ID: 16RW04-210414 Lab ID:HS21040859-05
Collection Date: 14-Apr-2021 12:55 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	19-Apr-2021 17:02
1,1-Dichloroethene	2.5	U	1.0	2.5	5.0	ug/L	5	19-Apr-2021 17:02
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	ug/L	5	19-Apr-2021 17:02
cis-1,2-Dichloroethene	**62**		**1.0**	**2.5**	**5.0**	**ug/L**	5	19-Apr-2021 17:02
Methylene chloride	10	U	2.0	10	10	ug/L	5	19-Apr-2021 17:02
Trichloroethene	**1,100**		**5.0**	**12**	**25**	**ug/L**	25	19-Apr-2021 17:23
Vinyl chloride	2.5	U	1.0	2.5	5.0	ug/L	5	19-Apr-2021 17:02
Surr: 1,2-Dichloroethane-d4	*97.8*			**0**	*81-118*	*%REC*	*5*	*19-Apr-2021 17:02*
Surr: 1,2-Dichloroethane-d4	*98.4*			**0**	*81-118*	*%REC*	*25*	*19-Apr-2021 17:23*
Surr: 4-Bromofluorobenzene	*94.2*			**0**	*85-114*	*%REC*	*5*	*19-Apr-2021 17:02*
Surr: 4-Bromofluorobenzene	*98.5*			**0**	*85-114*	*%REC*	*25*	*19-Apr-2021 17:23*
Surr: Dibromofluoromethane	*94.5*			**0**	*80-119*	*%REC*	*5*	*19-Apr-2021 17:02*
Surr: Dibromofluoromethane	*93.8*			**0**	*80-119*	*%REC*	*25*	*19-Apr-2021 17:23*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*5*	*19-Apr-2021 17:02*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*25*	*19-Apr-2021 17:23*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21040859
Sample ID: 16RW02-210414 Lab ID:HS21040859-06
Collection Date: 14-Apr-2021 13:40 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	19-Apr-2021 13:52
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Apr-2021 13:52
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Apr-2021 13:52
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Apr-2021 13:52
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	19-Apr-2021 13:52
Trichloroethene	**3.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Apr-2021 13:52
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Apr-2021 13:52
Surr: 1,2-Dichloroethane-d4	*98.4*			**0**	*81-118*	*%REC*	*1*	*19-Apr-2021 13:52*
Surr: 4-Bromofluorobenzene	*94.1*			**0**	*85-114*	*%REC*	*1*	*19-Apr-2021 13:52*
Surr: Dibromofluoromethane	*94.6*			**0**	*80-119*	*%REC*	*1*	*19-Apr-2021 13:52*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*19-Apr-2021 13:52*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21040859
Sample ID: 16WW16-210415 Lab ID:HS21040859-07
Collection Date: 15-Apr-2021 07:25 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	50	U	15	50	50	ug/L	50	19-Apr-2021 20:54
1,1-Dichloroethene	**33**	J	**10**	**25**	**50**	**ug/L**	50	19-Apr-2021 20:54
1,2-Dichloroethane	**32**	J	**10**	**25**	**50**	**ug/L**	50	19-Apr-2021 20:54
cis-1,2-Dichloroethene	**13,000**		**100**	**250**	**500**	**ug/L**	500	19-Apr-2021 21:15
Methylene chloride	100	U	20	100	100	ug/L	50	19-Apr-2021 20:54
Trichloroethene	**28,000**		**100**	**250**	**500**	**ug/L**	500	19-Apr-2021 21:15
Vinyl chloride	**260**		**10**	**25**	**50**	**ug/L**	50	19-Apr-2021 20:54
Surr: 1,2-Dichloroethane-d4	*97.8*			**0**	*81-118*	*%REC*	*50*	*19-Apr-2021 20:54*
Surr: 1,2-Dichloroethane-d4	*98.2*			**0**	*81-118*	*%REC*	*500*	*19-Apr-2021 21:15*
Surr: 4-Bromofluorobenzene	*95.4*			**0**	*85-114*	*%REC*	*500*	*19-Apr-2021 21:15*
Surr: 4-Bromofluorobenzene	*95.5*			**0**	*85-114*	*%REC*	*50*	*19-Apr-2021 20:54*
Surr: Dibromofluoromethane	*93.0*			**0**	*80-119*	*%REC*	*500*	*19-Apr-2021 21:15*
Surr: Dibromofluoromethane	*92.6*			**0**	*80-119*	*%REC*	*50*	*19-Apr-2021 20:54*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*50*	*19-Apr-2021 20:54*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*500*	*19-Apr-2021 21:15*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	**0.00240**		**0.000144**	**0.000500**	**0.00100**	**mg/L**	1	21-Apr-2021 11:59
Ethene	**0.00344**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	21-Apr-2021 11:59
Methane	**0.437**		**0.00535**	**0.0250**	**0.0250**	**mg/L**	50	21-Apr-2021 14:32
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**338**		**5.00**	**5.00**	**5.00**	**mg/L**	1	21-Apr-2021 22:18
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**4.71**		**0.500**	**0.500**	**1.00**	**mg/L**	1	27-Apr-2021 19:00
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**3.97**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	16-Apr-2021 19:17
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	16-Apr-2021 19:17
Sulfate	**367**		**2.00**	**5.00**	**5.00**	**mg/L**	10	28-Apr-2021 22:46
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21040859
Sample ID: 16WW56-210415 Lab ID:HS21040859-08
Collection Date: 15-Apr-2021 08:15 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	19-Apr-2021 14:13
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Apr-2021 14:13
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Apr-2021 14:13
cis-1,2-Dichloroethene	**1.2**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Apr-2021 14:13
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	19-Apr-2021 14:13
Trichloroethene	**14**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Apr-2021 14:13
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Apr-2021 14:13
Surr: 1,2-Dichloroethane-d4	*99.9*			**0**	*81-118*	*%REC*	*1*	*19-Apr-2021 14:13*
Surr: 4-Bromofluorobenzene	*91.1*			**0**	*85-114*	*%REC*	*1*	*19-Apr-2021 14:13*
Surr: Dibromofluoromethane	*95.0*			**0**	*80-119*	*%REC*	*1*	*19-Apr-2021 14:13*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*19-Apr-2021 14:13*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	21-Apr-2021 12:25
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	21-Apr-2021 12:25
Methane	**0.00102**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	21-Apr-2021 12:25
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**170**		**5.00**	**5.00**	**5.00**	**mg/L**	1	21-Apr-2021 22:07
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**1.80**		**0.500**	**0.500**	**1.00**	**mg/L**	1	27-Apr-2021 19:16
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**5.19**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	16-Apr-2021 19:37
Nitrogen, Nitrate (As N)	**0.249**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	16-Apr-2021 19:37
Sulfate	**137**		**0.400**	**1.00**	**1.00**	**mg/L**	2	16-Apr-2021 19:37
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21040859
Sample ID: 16WW22-210415 Lab ID:HS21040859-09
Collection Date: 15-Apr-2021 09:10 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	19-Apr-2021 14:34
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Apr-2021 14:34
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Apr-2021 14:34
cis-1,2-Dichloroethene	**2.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Apr-2021 14:34
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	19-Apr-2021 14:34
Trichloroethene	**12**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Apr-2021 14:34
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Apr-2021 14:34
Surr: 1,2-Dichloroethane-d4	*100.0*			**0**	*81-118*	*%REC*	*1*	*19-Apr-2021 14:34*
Surr: 4-Bromofluorobenzene	*95.8*			**0**	*85-114*	*%REC*	*1*	*19-Apr-2021 14:34*
Surr: Dibromofluoromethane	*92.6*			**0**	*80-119*	*%REC*	*1*	*19-Apr-2021 14:34*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*1*	*19-Apr-2021 14:34*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	21-Apr-2021 13:58
Ethene	**0.00124**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	21-Apr-2021 13:58
Methane	**0.000981**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	21-Apr-2021 13:58
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**252**		**5.00**	**5.00**	**5.00**	**mg/L**	1	21-Apr-2021 22:24
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**1.49**		**0.500**	**0.500**	**1.00**	**mg/L**	1	27-Apr-2021 20:22
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**4.62**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	16-Apr-2021 21:34
Nitrogen, Nitrate (As N)	**0.0682**	J	**0.0300**	**0.100**	**0.100**	**mg/L**	1	16-Apr-2021 21:34
Sulfate	**209**		**2.00**	**5.00**	**5.00**	**mg/L**	10	28-Apr-2021 22:59
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21040859
Sample ID: 16WW41-210415 Lab ID:HS21040859-10
Collection Date: 15-Apr-2021 10:00 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	19-Apr-2021 17:44
1,1-Dichloroethene	**19**		**1.0**	**2.5**	**5.0**	**ug/L**	5	19-Apr-2021 17:44
1,2-Dichloroethane	**4.2**	J	**1.0**	**2.5**	**5.0**	**ug/L**	5	19-Apr-2021 17:44
cis-1,2-Dichloroethene	**2,600**		**20**	**50**	**100**	**ug/L**	100	20-Apr-2021 13:50
Methylene chloride	10	U	2.0	10	10	ug/L	5	19-Apr-2021 17:44
Trichloroethene	**6,200**		**20**	**50**	**100**	**ug/L**	100	20-Apr-2021 13:50
Vinyl chloride	**330**		**1.0**	**2.5**	**5.0**	**ug/L**	5	19-Apr-2021 17:44
Surr: 1,2-Dichloroethane-d4	*97.7*			**0**	*81-118*	*%REC*	*5*	*19-Apr-2021 17:44*
Surr: 1,2-Dichloroethane-d4	*98.9*			**0**	*81-118*	*%REC*	*100*	*20-Apr-2021 13:50*
Surr: 4-Bromofluorobenzene	*92.5*			**0**	*85-114*	*%REC*	*5*	*19-Apr-2021 17:44*
Surr: 4-Bromofluorobenzene	*97.2*			**0**	*85-114*	*%REC*	*100*	*20-Apr-2021 13:50*
Surr: Dibromofluoromethane	*93.3*			**0**	*80-119*	*%REC*	*5*	*19-Apr-2021 17:44*
Surr: Dibromofluoromethane	*92.4*			**0**	*80-119*	*%REC*	*100*	*20-Apr-2021 13:50*
Surr: Toluene-d8	*110*			**0**	*89-112*	*%REC*	*5*	*19-Apr-2021 17:44*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*100*	*20-Apr-2021 13:50*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	21-Apr-2021 14:22
Ethene	**0.0143**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	21-Apr-2021 14:22
Methane	**0.0160**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	21-Apr-2021 14:22
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**1,040**		**5.00**	**5.00**	**5.00**	**mg/L**	1	21-Apr-2021 22:50
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**47.6**		**5.00**	**5.00**	**10.0**	**mg/L**	10	28-Apr-2021 11:38
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**9.79**		**0.600**	**2.00**	**2.00**	**mg/L**	20	30-Apr-2021 09:41
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	16-Apr-2021 21:52
Sulfate	**7,890**		**100**	**250**	**250**	**mg/L**	500	28-Apr-2021 23:12
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21040859
Sample ID: 16WW21-210415 Lab ID:HS21040859-11
Collection Date: 15-Apr-2021 10:45 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	19-Apr-2021 14:55
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Apr-2021 14:55
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Apr-2021 14:55
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Apr-2021 14:55
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	19-Apr-2021 14:55
Trichloroethene	**1.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Apr-2021 14:55
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Apr-2021 14:55
Surr: 1,2-Dichloroethane-d4	*99.2*			**0**	*81-118*	*%REC*	*1*	*19-Apr-2021 14:55*
Surr: 4-Bromofluorobenzene	*94.3*			**0**	*85-114*	*%REC*	*1*	*19-Apr-2021 14:55*
Surr: Dibromofluoromethane	*91.9*			**0**	*80-119*	*%REC*	*1*	*19-Apr-2021 14:55*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*19-Apr-2021 14:55*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21040859
Sample ID: 16WW39-210415 Lab ID:HS21040859-12
Collection Date: 15-Apr-2021 11:30 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	19-Apr-2021 15:17
1,1-Dichloroethene	**0.75**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Apr-2021 15:17
1,2-Dichloroethane	**0.72**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Apr-2021 15:17
cis-1,2-Dichloroethene	**39**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Apr-2021 15:17
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	19-Apr-2021 15:17
Trichloroethene	**330**		**1.0**	**2.5**	**5.0**	**ug/L**	5	20-Apr-2021 14:54
Vinyl chloride	**1.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Apr-2021 15:17
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*19-Apr-2021 15:17*
Surr: 1,2-Dichloroethane-d4	*99.9*			**0**	*81-118*	*%REC*	*5*	*20-Apr-2021 14:54*
Surr: 4-Bromofluorobenzene	*95.7*			**0**	*85-114*	*%REC*	*1*	*19-Apr-2021 15:17*
Surr: 4-Bromofluorobenzene	*94.2*			**0**	*85-114*	*%REC*	*5*	*20-Apr-2021 14:54*
Surr: Dibromofluoromethane	*94.4*			**0**	*80-119*	*%REC*	*1*	*19-Apr-2021 15:17*
Surr: Dibromofluoromethane	*92.8*			**0**	*80-119*	*%REC*	*5*	*20-Apr-2021 14:54*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*19-Apr-2021 15:17*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*5*	*20-Apr-2021 14:54*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21040859
Sample ID: 16WW51-210415 Lab ID:HS21040859-13
Collection Date: 15-Apr-2021 12:15 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	19-Apr-2021 15:38
1,1-Dichloroethene	**0.83**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Apr-2021 15:38
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Apr-2021 15:38
cis-1,2-Dichloroethene	**44**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Apr-2021 15:38
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	19-Apr-2021 15:38
Trichloroethene	**560**		**2.0**	**5.0**	**10**	**ug/L**	10	20-Apr-2021 15:15
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Apr-2021 15:38
Surr: 1,2-Dichloroethane-d4	*98.2*			**0**	*81-118*	*%REC*	*1*	*19-Apr-2021 15:38*
Surr: 1,2-Dichloroethane-d4	*98.2*			**0**	*81-118*	*%REC*	*10*	*20-Apr-2021 15:15*
Surr: 4-Bromofluorobenzene	*93.7*			**0**	*85-114*	*%REC*	*1*	*19-Apr-2021 15:38*
Surr: 4-Bromofluorobenzene	*92.7*			**0**	*85-114*	*%REC*	*10*	*20-Apr-2021 15:15*
Surr: Dibromofluoromethane	*93.3*			**0**	*80-119*	*%REC*	*1*	*19-Apr-2021 15:38*
Surr: Dibromofluoromethane	*95.1*			**0**	*80-119*	*%REC*	*10*	*20-Apr-2021 15:15*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*19-Apr-2021 15:38*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*10*	*20-Apr-2021 15:15*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21040859
Sample ID: 16EW07-210415 Lab ID:HS21040859-14
Collection Date: 15-Apr-2021 13:00 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1,000	U	300	1000	1000	ug/L	1000	20-Apr-2021 13:29
1,1-Dichloroethene	500	U	200	500	1000	ug/L	1000	20-Apr-2021 13:29
1,2-Dichloroethane	500	U	200	500	1000	ug/L	1000	20-Apr-2021 13:29
cis-1,2-Dichloroethene	500	U	200	500	1000	ug/L	1000	20-Apr-2021 13:29
Methylene chloride	2,000	U	400	2000	2000	ug/L	1000	20-Apr-2021 13:29
Trichloroethene	500	U	200	500	1000	ug/L	1000	20-Apr-2021 13:29
Vinyl chloride	500	U	200	500	1000	ug/L	1000	20-Apr-2021 13:29
Surr: 1,2-Dichloroethane-d4	*97.8*			**0**	*81-118*	*%REC*	*1000*	*20-Apr-2021 13:29*
Surr: 4-Bromofluorobenzene	*94.2*			**0**	*85-114*	*%REC*	*1000*	*20-Apr-2021 13:29*
Surr: Dibromofluoromethane	*95.1*			**0**	*80-119*	*%REC*	*1000*	*20-Apr-2021 13:29*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1000*	*20-Apr-2021 13:29*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Apr-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21040859
Sample ID: Trip Blank - 210415 Lab ID:HS21040859-15
Collection Date: 14-Apr-2021 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	19-Apr-2021 13:31
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Apr-2021 13:31
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Apr-2021 13:31
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Apr-2021 13:31
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	19-Apr-2021 13:31
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Apr-2021 13:31
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Apr-2021 13:31
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*19-Apr-2021 13:31*
Surr: 4-Bromofluorobenzene	*93.5*			**0**	*85-114*	*%REC*	*1*	*19-Apr-2021 13:31*
Surr: Dibromofluoromethane	*94.5*			**0**	*80-119*	*%REC*	*1*	*19-Apr-2021 13:31*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*19-Apr-2021 13:31*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21040859

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R381929 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21040859-15	Trip Blank - 210415	14 Apr 2021 00:00			19 Apr 2021 13:31	1
Batch ID: R381929 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21040859-01	16PM02-210414	14 Apr 2021 10:30			19 Apr 2021 19:08	250
HS21040859-01	16PM02-210414	14 Apr 2021 10:30			19 Apr 2021 18:47	25
HS21040859-02	16PM03-210414	14 Apr 2021 11:20			19 Apr 2021 19:50	250
HS21040859-02	16PM03-210414	14 Apr 2021 11:20			19 Apr 2021 19:29	25
HS21040859-03	16PM03-210414-FD	14 Apr 2021 11:20			19 Apr 2021 20:33	250
HS21040859-03	16PM03-210414-FD	14 Apr 2021 11:20			19 Apr 2021 20:12	25
HS21040859-04	16RW01-210414	14 Apr 2021 12:10			19 Apr 2021 18:26	100
HS21040859-04	16RW01-210414	14 Apr 2021 12:10			19 Apr 2021 18:05	10
HS21040859-05	16RW04-210414	14 Apr 2021 12:55			19 Apr 2021 17:23	25
HS21040859-05	16RW04-210414	14 Apr 2021 12:55			19 Apr 2021 17:02	5
HS21040859-06	16RW02-210414	14 Apr 2021 13:40			19 Apr 2021 13:52	1
HS21040859-07	16WW16-210415	15 Apr 2021 07:25			19 Apr 2021 21:15	500
HS21040859-07	16WW16-210415	15 Apr 2021 07:25			19 Apr 2021 20:54	50
HS21040859-08	16WW56-210415	15 Apr 2021 08:15			19 Apr 2021 14:13	1
HS21040859-09	16WW22-210415	15 Apr 2021 09:10			19 Apr 2021 14:34	1
HS21040859-10	16WW41-210415	15 Apr 2021 10:00			19 Apr 2021 17:44	5
HS21040859-11	16WW21-210415	15 Apr 2021 10:45			19 Apr 2021 14:55	1
HS21040859-12	16WW39-210415	15 Apr 2021 11:30			19 Apr 2021 15:17	1
HS21040859-13	16WW51-210415	15 Apr 2021 12:15			19 Apr 2021 15:38	1
Batch ID: R382069 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21040859-10	16WW41-210415	15 Apr 2021 10:00			20 Apr 2021 13:50	100
HS21040859-12	16WW39-210415	15 Apr 2021 11:30			20 Apr 2021 14:54	5
HS21040859-13	16WW51-210415	15 Apr 2021 12:15			20 Apr 2021 15:15	10
HS21040859-14	16EW07-210415	15 Apr 2021 13:00			20 Apr 2021 13:29	1000
Batch ID: R382121 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS21040859-07	16WW16-210415	15 Apr 2021 07:25			21 Apr 2021 22:18	1
HS21040859-08	16WW56-210415	15 Apr 2021 08:15			21 Apr 2021 22:07	1
HS21040859-09	16WW22-210415	15 Apr 2021 09:10			21 Apr 2021 22:24	1
HS21040859-10	16WW41-210415	15 Apr 2021 10:00			21 Apr 2021 22:50	1
Batch ID: R382191 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS21040859-07	16WW16-210415	15 Apr 2021 07:25			21 Apr 2021 14:32	50
HS21040859-07	16WW16-210415	15 Apr 2021 07:25			21 Apr 2021 11:59	1
HS21040859-08	16WW56-210415	15 Apr 2021 08:15			21 Apr 2021 12:25	1
HS21040859-09	16WW22-210415	15 Apr 2021 09:10			21 Apr 2021 13:58	1
HS21040859-10	16WW41-210415	15 Apr 2021 10:00			21 Apr 2021 14:22	1

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21040859

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R382498 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21040859-07	16WW16-210415	15 Apr 2021 07:25			16 Apr 2021 19:17	1
HS21040859-08	16WW56-210415	15 Apr 2021 08:15			16 Apr 2021 19:37	2
HS21040859-09	16WW22-210415	15 Apr 2021 09:10			16 Apr 2021 21:34	1
HS21040859-10	16WW41-210415	15 Apr 2021 10:00			16 Apr 2021 21:52	5
Batch ID: R382505 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS21040859-07	16WW16-210415	15 Apr 2021 07:25			27 Apr 2021 19:00	1
HS21040859-08	16WW56-210415	15 Apr 2021 08:15			27 Apr 2021 19:16	1
HS21040859-09	16WW22-210415	15 Apr 2021 09:10			27 Apr 2021 20:22	1
Batch ID: R382565 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS21040859-10	16WW41-210415	15 Apr 2021 10:00			28 Apr 2021 11:38	10
Batch ID: R382646 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21040859-07	16WW16-210415	15 Apr 2021 07:25			28 Apr 2021 22:46	10
HS21040859-09	16WW22-210415	15 Apr 2021 09:10			28 Apr 2021 22:59	10
HS21040859-10	16WW41-210415	15 Apr 2021 10:00			28 Apr 2021 23:12	500
Batch ID: R382746 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21040859-10	16WW41-210415	15 Apr 2021 10:00			30 Apr 2021 09:41	20
Batch ID: R382774 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS21040859-01	16PM02-210414	14 Apr 2021 10:30			30 Apr 2021 15:53	1
HS21040859-02	16PM03-210414	14 Apr 2021 11:20			30 Apr 2021 15:53	1
HS21040859-03	16PM03-210414-FD	14 Apr 2021 11:20			30 Apr 2021 15:53	1
HS21040859-04	16RW01-210414	14 Apr 2021 12:10			30 Apr 2021 15:53	1
HS21040859-05	16RW04-210414	14 Apr 2021 12:55			30 Apr 2021 15:53	1
HS21040859-06	16RW02-210414	14 Apr 2021 13:40			30 Apr 2021 15:53	1
HS21040859-07	16WW16-210415	15 Apr 2021 07:25			30 Apr 2021 15:53	1
HS21040859-08	16WW56-210415	15 Apr 2021 08:15			30 Apr 2021 15:53	1
HS21040859-09	16WW22-210415	15 Apr 2021 09:10			30 Apr 2021 15:53	1
HS21040859-10	16WW41-210415	15 Apr 2021 10:00			30 Apr 2021 15:53	1
HS21040859-11	16WW21-210415	15 Apr 2021 10:45			30 Apr 2021 15:53	1
HS21040859-12	16WW39-210415	15 Apr 2021 11:30			30 Apr 2021 15:53	1
HS21040859-13	16WW51-210415	15 Apr 2021 12:15			30 Apr 2021 15:53	1
HS21040859-14	16EW07-210415	15 Apr 2021 13:00			30 Apr 2021 15:53	1

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21040859

QC BATCH REPORT

Batch ID: R382191 (0) **Instrument: FID-4** **Method: DISSOLVED GASES BY RSK-175**

MBLK Sample ID: **MBLK-210421** Units: **mg/L** Analysis Date: **21-Apr-2021 10:29**
Client ID: Run ID: **FID-4_382191** SeqNo: **6056346** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000500	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000500	0.000500								U

LCS Sample ID: **LCS-210421** Units: **mg/L** Analysis Date: **21-Apr-2021 10:40**
Client ID: Run ID: **FID-4_382191** SeqNo: **6056347** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0200	0.00100	0.01804	0	111	75 - 125				
Ethene	0.0182	0.00100	0.0168	0	109	75 - 125				
Methane	0.00918	0.000500	0.009647	0	95.2	75 - 125				

MS Sample ID: **HS21040859-08MS** Units: **mg/L** Analysis Date: **21-Apr-2021 13:01**
Client ID: **16WW56-210415** Run ID: **FID-4_382191** SeqNo: **6056357** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0159	0.00100	0.01804	0	88.3	75 - 125				
Ethene	0.0157	0.00100	0.0168	0	93.6	75 - 125				
Methane	0.00746	0.000500	0.009647	0.001022	66.8	75 - 125				S

MSD Sample ID: **HS21040859-08MSD** Units: **mg/L** Analysis Date: **21-Apr-2021 13:46**
Client ID: **16WW56-210415** Run ID: **FID-4_382191** SeqNo: **6056358** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0160	0.00100	0.01804	0	88.5	75 - 125	0.01594	0.166	30	
Ethene	0.0157	0.00100	0.0168	0	93.6	75 - 125	0.01573	0.0543	30	
Methane	0.00713	0.000500	0.009647	0.001022	63.3	75 - 125	0.007465	4.6	30	S

The following samples were analyzed in this batch: HS21040859-07 HS21040859-08 HS21040859-09 HS21040859-10

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21040859

QC BATCH REPORT

Batch ID: R381929 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210419** Units: **ug/L** Analysis Date: **19-Apr-2021 13:10**
Client ID: Run ID: **VOA6_381929** SeqNo: **6050030** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*50.27*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.74*	*1.0*	*50*	*0*	*97.5*	*85 - 114*				
Surr: Dibromofluoromethane	*47.44*	*1.0*	*50*	*0*	*94.9*	*80 - 119*				
Surr: Toluene-d8	*53.5*	*1.0*	*50*	*0*	*107*	*89 - 112*				

LCS Sample ID: **VLCSW-210419** Units: **ug/L** Analysis Date: **19-Apr-2021 12:28**
Client ID: Run ID: **VOA6_381929** SeqNo: **6050029** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.99	1.0	20	0	100.0	80 - 119				
1,1-Dichloroethene	18.68	1.0	20	0	93.4	71 - 131				
1,2-Dichloroethane	20.3	1.0	20	0	102	73 - 128				
cis-1,2-Dichloroethene	21.51	1.0	20	0	108	78 - 123				
Methylene chloride	23.03	2.0	20	0	115	74 - 124				
Trichloroethene	20.55	1.0	20	0	103	79 - 123				
Vinyl chloride	21.84	1.0	20	0	109	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.32*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.45*	*1.0*	*50*	*0*	*98.9*	*85 - 114*				
Surr: Dibromofluoromethane	*48.91*	*1.0*	*50*	*0*	*97.8*	*80 - 119*				
Surr: Toluene-d8	*47.77*	*1.0*	*50*	*0*	*95.5*	*89 - 112*				

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21040859

QC BATCH REPORT

Batch ID: R381929 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21040859-08MS** Units: **ug/L** Analysis Date: **19-Apr-2021 15:59**
Client ID: **16WW56-210415** Run ID: **VOA6_381929** SeqNo: **6050038** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	21.01	1.0	20	0	105	80 - 119				
1,1-Dichloroethene	19.43	1.0	20	0	97.2	71 - 131				
1,2-Dichloroethane	21.25	1.0	20	0	106	73 - 128				
cis-1,2-Dichloroethene	22.21	1.0	20	1.174	105	78 - 123				
Methylene chloride	21.34	2.0	20	0	107	74 - 124				
Trichloroethene	37.3	1.0	20	13.68	118	79 - 123				
Vinyl chloride	19.7	1.0	20	0	98.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*49.07*	*1.0*	*50*	*0*	*98.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.8*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*46.88*	*1.0*	*50*	*0*	*93.8*	*80 - 119*				
Surr: Toluene-d8	*51.72*	*1.0*	*50*	*0*	*103*	*89 - 112*				

MSD Sample ID: **HS21040859-08MSD** Units: **ug/L** Analysis Date: **19-Apr-2021 16:20**
Client ID: **16WW56-210415** Run ID: **VOA6_381929** SeqNo: **6050039** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	21.13	1.0	20	0	106	80 - 119	21.01	0.582	20	
1,1-Dichloroethene	17.91	1.0	20	0	89.6	71 - 131	19.43	8.15	20	
1,2-Dichloroethane	21.09	1.0	20	0	105	73 - 128	21.25	0.759	20	
cis-1,2-Dichloroethene	21.67	1.0	20	1.174	102	78 - 123	22.21	2.46	20	
Methylene chloride	20.98	2.0	20	0	105	74 - 124	21.34	1.72	20	
Trichloroethene	34.64	1.0	20	13.68	105	79 - 123	37.3	7.39	20	
Vinyl chloride	18.86	1.0	20	0	94.3	58 - 137	19.7	4.38	20	
Surr: 1,2-Dichloroethane-d4	*49.48*	*1.0*	*50*	*0*	*99.0*	*81 - 118*	*49.07*	*0.843*	*20*	
Surr: 4-Bromofluorobenzene	*50.4*	*1.0*	*50*	*0*	*101*	*85 - 114*	*50.8*	*0.79*	*20*	
Surr: Dibromofluoromethane	*45.79*	*1.0*	*50*	*0*	*91.6*	*80 - 119*	*46.88*	*2.36*	*20*	
Surr: Toluene-d8	*52.07*	*1.0*	*50*	*0*	*104*	*89 - 112*	*51.72*	*0.671*	*20*	

The following samples were analyzed in this batch:

HS21040859-01	HS21040859-02	HS21040859-03	HS21040859-04
HS21040859-05	HS21040859-06	HS21040859-07	HS21040859-08
HS21040859-09	HS21040859-10	HS21040859-11	HS21040859-12
HS21040859-13	HS21040859-15		

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21040859

QC BATCH REPORT

Batch ID: R382069 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210420** Units: **ug/L** Analysis Date: **20-Apr-2021 12:47**
Client ID: Run ID: **VOA6_382069** SeqNo: **6053299** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*49.97*	*1.0*	*50*	*0*	*99.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.01*	*1.0*	*50*	*0*	*96.0*	*85 - 114*				
Surr: Dibromofluoromethane	*46.96*	*1.0*	*50*	*0*	*93.9*	*80 - 119*				
Surr: Toluene-d8	*53.95*	*1.0*	*50*	*0*	*108*	*89 - 112*				

LCS Sample ID: **VLCSW-210420** Units: **ug/L** Analysis Date: **20-Apr-2021 11:37**
Client ID: Run ID: **VOA6_382069** SeqNo: **6053298** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.41	1.0	20	0	97.0	80 - 119				
1,1-Dichloroethene	20.18	1.0	20	0	101	71 - 131				
1,2-Dichloroethane	20.68	1.0	20	0	103	73 - 128				
cis-1,2-Dichloroethene	21.3	1.0	20	0	106	78 - 123				
Methylene chloride	22.91	2.0	20	0	115	74 - 124				
Trichloroethene	20.34	1.0	20	0	102	79 - 123				
Vinyl chloride	21.84	1.0	20	0	109	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.97*	*1.0*	*50*	*0*	*108*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.38*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*50.33*	*1.0*	*50*	*0*	*101*	*80 - 119*				
Surr: Toluene-d8	*49.03*	*1.0*	*50*	*0*	*98.1*	*89 - 112*				

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21040859

QC BATCH REPORT

Batch ID: R382069 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21040859-10MS** Units: **ug/L** Analysis Date: **20-Apr-2021 14:12**
Client ID: **16WW41-210415** Run ID: **VOA6_382069** SeqNo: **6053302** PrepDate: DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	2080	100	2000	0	104	80 - 119				
1,1-Dichloroethene	2137	100	2000	0	107	71 - 131				
1,2-Dichloroethane	2136	100	2000	0	107	73 - 128				
cis-1,2-Dichloroethene	4717	100	2000	2602	106	78 - 123				
Methylene chloride	2154	200	2000	0	108	74 - 124				
Trichloroethene	8625	100	2000	6210	121	79 - 123				
Vinyl chloride	2487	100	2000	345.9	107	58 - 137				
Surr: 1,2-Dichloroethane-d4	*4955*	*100*	*5000*	*0*	*99.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*5068*	*100*	*5000*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*4683*	*100*	*5000*	*0*	*93.7*	*80 - 119*				
Surr: Toluene-d8	*5164*	*100*	*5000*	*0*	*103*	*89 - 112*				

MSD Sample ID: **HS21040859-10MSD** Units: **ug/L** Analysis Date: **20-Apr-2021 14:33**
Client ID: **16WW41-210415** Run ID: **VOA6_382069** SeqNo: **6053303** PrepDate: DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	2089	100	2000	0	104	80 - 119	2080	0.403	20	
1,1-Dichloroethene	1890	100	2000	0	94.5	71 - 131	2137	12.2	20	
1,2-Dichloroethane	2044	100	2000	0	102	73 - 128	2136	4.41	20	
cis-1,2-Dichloroethene	4540	100	2000	2602	96.9	78 - 123	4717	3.83	20	
Methylene chloride	2136	200	2000	0	107	74 - 124	2154	0.844	20	
Trichloroethene	8202	100	2000	6210	99.6	79 - 123	8625	5.04	20	
Vinyl chloride	2214	100	2000	345.9	93.4	58 - 137	2487	11.6	20	
Surr: 1,2-Dichloroethane-d4	*4744*	*100*	*5000*	*0*	*94.9*	*81 - 118*	*4955*	*4.34*	*20*	
Surr: 4-Bromofluorobenzene	*4998*	*100*	*5000*	*0*	*100.0*	*85 - 114*	*5068*	*1.39*	*20*	
Surr: Dibromofluoromethane	*4621*	*100*	*5000*	*0*	*92.4*	*80 - 119*	*4683*	*1.33*	*20*	
Surr: Toluene-d8	*5168*	*100*	*5000*	*0*	*103*	*89 - 112*	*5164*	*0.067*	*20*	

The following samples were analyzed in this batch: HS21040859-10 HS21040859-12 HS21040859-13 HS21040859-14

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21040859

QC BATCH REPORT

Batch ID: R382121 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM2320B**

MBLK Sample ID: **WBLKW2-210421** Units: **mg/L** Analysis Date: **21-Apr-2021 21:43**
Client ID: Run ID: **ManTech01_382121** SeqNo: **6054847** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **LCS2-210421** Units: **mg/L** Analysis Date: **21-Apr-2021 21:52**
Client ID: Run ID: **ManTech01_382121** SeqNo: **6054848** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1027	5.00	1000	0	103	85 - 115				

LCSD Sample ID: **LCSD2-210421** Units: **mg/L** Analysis Date: **21-Apr-2021 22:01**
Client ID: Run ID: **ManTech01_382121** SeqNo: **6054849** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1059	5.00	1000	0	106	85 - 115	1027	3.1	20	

DUP Sample ID: **HS21040859-08DUP** Units: **mg/L** Analysis Date: **21-Apr-2021 22:12**
Client ID: **16WW56-210415** Run ID: **ManTech01_382121** SeqNo: **6054851** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	168.4	5.00					169.7	0.769	20	

The following samples were analyzed in this batch: HS21040859-07 HS21040859-08 HS21040859-09 HS21040859-10

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21040859

QC BATCH REPORT

Batch ID: R382498 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **17-Apr-2021 03:01**
Client ID: Run ID: **ICS-Integrion_382498** SeqNo: **6063755** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **17-Apr-2021 03:21**
Client ID: Run ID: **ICS-Integrion_382498** SeqNo: **6063756** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.412	0.100	4	0	85.3	80 - 120				
Nitrogen, Nitrate (As N)	4.007	0.100	4	0	100	80 - 120				
Sulfate	19.87	0.500	20	0	99.4	80 - 120				

MS Sample ID: **HS21040859-08MS** Units: **mg/L** Analysis Date: **16-Apr-2021 19:56**
Client ID: **16WW56-210415** Run ID: **ICS-Integrion_382498** SeqNo: **6063747** PrepDate: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	9.16	0.200	4	5.189	99.3	80 - 120				
Nitrogen, Nitrate (As N)	4.434	0.200	4	0.2492	105	80 - 120				
Sulfate	154.9	1.00	20	136.8	90.4	80 - 120				O

MSD Sample ID: **HS21040859-08MSD** Units: **mg/L** Analysis Date: **16-Apr-2021 21:13**
Client ID: **16WW56-210415** Run ID: **ICS-Integrion_382498** SeqNo: **6063750** PrepDate: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	9.203	0.200	4	5.189	100	80 - 120	9.16	0.462	20	
Nitrogen, Nitrate (As N)	4.414	0.200	4	0.2492	104	80 - 120	4.434	0.457	20	
Sulfate	155	1.00	20	136.8	90.8	80 - 120	154.9	0.0423	20	O

The following samples were analyzed in this batch: HS21040859-07 HS21040859-08 HS21040859-09 HS21040859-10

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21040859

QC BATCH REPORT

Batch ID: R382505 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **MBLK-04272021** Units: **mg/L** Analysis Date: **27-Apr-2021 16:58**
Client ID: Run ID: **TOC_04_382505** SeqNo: **6063982** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	0.500	1.00								U

LCS Sample ID: **LCS-04272021** Units: **mg/L** Analysis Date: **27-Apr-2021 17:14**
Client ID: Run ID: **TOC_04_382505** SeqNo: **6063983** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.152	1.00	10	0	91.5	85 - 115				

LCSD Sample ID: **LCSD-04272021** Units: **mg/L** Analysis Date: **27-Apr-2021 17:29**
Client ID: Run ID: **TOC_04_382505** SeqNo: **6063984** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.77	1.00	10	0	97.7	85 - 115	9.152	6.53	20	

MS Sample ID: **HS21040859-08MS** Units: **mg/L** Analysis Date: **27-Apr-2021 19:32**
Client ID: **16WW56-210415** Run ID: **TOC_04_382505** SeqNo: **6063991** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	11.87	1.00	10	1.798	101	80 - 120				

The following samples were analyzed in this batch: HS21040859-07 HS21040859-08 HS21040859-09

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21040859

QC BATCH REPORT

Batch ID: R382565 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **MBLK-04282021** Units: **mg/L** Analysis Date: **28-Apr-2021 10:39**
Client ID: Run ID: **TOC_04_382565** SeqNo: **6065153** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	0.500	1.00								U

LCS Sample ID: **LCS-04282021** Units: **mg/L** Analysis Date: **28-Apr-2021 10:54**
Client ID: Run ID: **TOC_04_382565** SeqNo: **6065154** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.18	1.00	10	0	102	85 - 115				

LCSD Sample ID: **LCSD-04282021** Units: **mg/L** Analysis Date: **28-Apr-2021 11:09**
Client ID: Run ID: **TOC_04_382565** SeqNo: **6065155** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.81	1.00	10	0	98.1	85 - 115	10.18	3.7	20	

MS Sample ID: **HS21041366-01MS** Units: **mg/L** Analysis Date: **28-Apr-2021 12:26**
Client ID: Run ID: **TOC_04_382565** SeqNo: **6065160** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	18.56	1.00	10	7.513	110	80 - 120				

The following samples were analyzed in this batch: HS21040859-10

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21040859

QC BATCH REPORT

Batch ID: R382646 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **28-Apr-2021 19:59**
Client ID: Run ID: **ICS2100_382646** SeqNo: **6067019** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **28-Apr-2021 20:12**
Client ID: Run ID: **ICS2100_382646** SeqNo: **6067020** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	19.43	0.500	20	0	97.2	80 - 120				

MS Sample ID: **HS21041447-01MS** Units: **mg/L** Analysis Date: **28-Apr-2021 18:30**
Client ID: Run ID: **ICS2100_382646** SeqNo: **6067015** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	32.06	0.500	10	22.49	95.8	80 - 120				

MSD Sample ID: **HS21041447-01MSD** Units: **mg/L** Analysis Date: **28-Apr-2021 18:43**
Client ID: Run ID: **ICS2100_382646** SeqNo: **6067016** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	31.85	0.500	10	22.49	93.7	80 - 120	32.06	0.665	20	

The following samples were analyzed in this batch: HS21040859-07 HS21040859-09 HS21040859-10

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21040859

QC BATCH REPORT

Batch ID: R382746 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **29-Apr-2021 10:03**
Client ID: Run ID: **ICS-Integrion_382746** SeqNo: **6069396** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **29-Apr-2021 10:21**
Client ID: Run ID: **ICS-Integrion_382746** SeqNo: **6069397** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.534	0.100	4	0	88.4	80 - 120				

MS Sample ID: **HS21041522-01MS** Units: **mg/L** Analysis Date: **29-Apr-2021 11:00**
Client ID: Run ID: **ICS-Integrion_382746** SeqNo: **6069399** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	20.74	0.500	10	10.6	101	80 - 120				

MSD Sample ID: **HS21041522-01MSD** Units: **mg/L** Analysis Date: **29-Apr-2021 11:20**
Client ID: Run ID: **ICS-Integrion_382746** SeqNo: **6069400** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	20.2	0.500	10	10.6	96.0	80 - 120	20.74	2.64	20	

The following samples were analyzed in this batch: HS21040859-10

ALS Houston, US Date: 30-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: **HS21040859**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	21-022-0	26-Mar-2022
California	2919, 2020-2021	01-May-2021
Dept of Defense	PJLA L20-507-R2	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2020-2021	01-May-2021
Kentucky	123043, 2021-2022	01-May-2022
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2021	31-Dec-2021
North Dakota	R-193 2020-2021	01-May-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-21-27	30-Apr-2022

ALS Houston, US Date: 30-Apr-21

Sample Receipt Checklist

Work Order ID: HS21040859 **Date/Time Received:** **16-Apr-2021 10:00**

Client Name: CBI-Houston **Received by:** **Pablo Marinez**

Completed By: */S/ Jared R. Makan* (eSignature) 16-Apr-2021 16:45 (Date/Time) **Reviewed by:** */S/ RJ Modashia* (eSignature) 19-Apr-2021 11:08 (Date/Time)

Matrices: **Water** Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	0.3°C UC/C	IR31
Cooler(s)/Kit(s):	46944	
Date/Time sample(s) sent to storage:	04/16/2021 16:45	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: RJ Modashia

Page 1 of 1

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 501032
Job: **LHAAP 16 April 2021**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D. / Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16PM02-210414	WG	4/14/21/1030		4	X					X						
16PM03-210414	WG	4/14/21/1120		4	X					X						
16PM03-210414-FD	WG	4/14/21/1120		4	X					X						
16RW01-210414	WG	4/14/21/1210		4	X					X						
16RW04-210414	WG	4/14/21/1255		4	X					X						
16RW02-210414	WG	4/14/21/1340		4	X					X						
16WW16-210415	WG	4/15/21/0725		10	X	X	X	X	X	X						
16WW56-210415	WG	4/15/21/0815		10	X	X	X	X	X	X						

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	4/15/21	1430	Patti Mc	4/16/21	10:00						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

HS21040859

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant LHAAP 16 April 20

46444 OJC
IR3 CFO

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Project: APTIM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 16 April 2021**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. / Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16WW56-210415-MS	WG	4/15/21/0815		10	X	X	X	X	X	X						
16WW56-210415-MSD	WG	4/15/21/0815		10	X	X	X	X	X	X						
16WW22-210415	WG	4/15/21/0910		10	X	X	X	X	X	X						
16WW41-210415	WG	4/15/21/1000		10	X	X	X	X	X	X						
16WW21-210415	WG	4/15/21/1045		4	X					X						
16WW39-210415	WG	4/15/21/1130		4	X					X						
16WW51-210415	WG	4/15/21/1215		4	X					X						
16 EW07-210415	WG	4/15/21/1300		4	X					X						

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	4/15/21	1430	Paula Mann	4-16-21	10:00						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

HS21040859

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant LHAAP 16 April 20

46944 0.3C
IR71 CFO

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: RJ Modashia

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 501032
Job: **LHAAP 16 April 2021**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D. / Time	Sample Matrix	Date	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
TRIP BLANK-210415	W	4/15/21		2	X											

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	4/15/21	1430	Pablo Mon		4/16/21	10:00					

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

46444 0.3C
IR-31 CFW

HS21040859

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant LHAAP 16 April 20

(Word) S:\t-ces\Forms\Chain of Custody - BiWeekly

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

46?

CUSTODY SEAL

Date: 4/15/21 Time: 1730
Name: SCOTT BEESINGER
Company: APTIM

Seal Broken By: SM
Date: 04/16/21

46444 APR 16 202.

Must Deliver Next Business Day
Time and Tempature Sensitive!

ALS

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFRASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 29MAR21
ACTWGT: 1.00 LB MAN
CAD: 0221247/CAFE3409
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-80 77443-RJ
RMA:

FedEx Express

FedEx TRK# 0221 9473 0841 7487

RETURNS MON-SAT
FRI - 16 APR AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FID: 5050257 15Apr2021 GOGA 56DC2/5FF2/1823

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

May 05, 2021

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS21041102**

Laboratory Results for: **Longhorn Army Ammunition Plant 16 April 2021**

Dear Vicki Graves ,

ALS Environmental received 11 sample(s) on Apr 21, 2021 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Work Order: HS21041102

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21041102-01	16WW25-210420	Groundwater		20-Apr-2021 07:25	21-Apr-2021 10:40	☐
HS21041102-02	16WW25-210420-FD	Groundwater		20-Apr-2021 07:25	21-Apr-2021 10:40	☐
HS21041102-03	16WW26-210420	Groundwater		20-Apr-2021 08:20	21-Apr-2021 10:40	☐
HS21041102-04	16WW29-210420	Groundwater		20-Apr-2021 09:10	21-Apr-2021 10:40	☐
HS21041102-05	16WW29-210420-FD	Groundwater		20-Apr-2021 09:10	21-Apr-2021 10:40	☐
HS21041102-06	16WW30-210420	Groundwater		20-Apr-2021 10:00	21-Apr-2021 10:40	☐
HS21041102-07	16WW55-210420	Groundwater		20-Apr-2021 10:45	21-Apr-2021 10:40	☐
HS21041102-08	16RW10-210420	Groundwater		20-Apr-2021 11:30	21-Apr-2021 10:40	☐
HS21041102-09	16RW09-210420	Groundwater		20-Apr-2021 12:15	21-Apr-2021 10:40	☐
HS21041102-10	16IW03-210420	Groundwater		20-Apr-2021 13:05	21-Apr-2021 10:40	☐
HS21041102-11	Trip Blank-210420	Water	CG-121520-1069	20-Apr-2021 00:00	21-Apr-2021 10:40	☐

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant 16 April 2021
Work Order: HS21041102

Work Order Comments

• The analysis for Perchlorate was subcontracted our ALS Houston TX, High Resolution Lab. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R382623

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R382250,R382319

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM5310B

Batch ID: R382811,R382818

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Batch ID: R382895

Sample ID: HS21041169-03MS

• MS is for an unrelated sample

WetChemistry by Method SW9056

Batch ID: R382206

Sample ID: 16IW03-210420 (HS21041102-10)

• Sample ran at 5X due to sample matrix

Sample ID: 16WW25-210420 (HS21041102-01)

• Sample ran at 5X due to high concentration of Sulfate

Sample ID: 16WW25-210420-FD (HS21041102-02)

• Sample ran at 5X due to high concentration of Sulfate

Sample ID: 16WW26-210420 (HS21041102-03)

• Sample ran at 5X due to high concentration of Sulfate

Sample ID: 16WW26-210420 (HS21041102-03MS)

• The MS and/or MSD recovery was outside of the control limits; however, the result in the parent sample is greater than 4x the spike amount. (Sulfate)

Sample ID: 16WW29-210420 (HS21041102-04)

• Sample ran at 5X due to high concentration of Sulfate

Sample ID: 16WW29-210420-FD (HS21041102-05)

• Sample ran at 5X due to high concentration of Sulfate

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant 16 April 2021
Work Order: HS21041102

WetChemistry by Method SW9056

Batch ID: R382206

Sample ID: 16WW55-210420 (HS21041102-07)

- Sample ran at 5X due to high concentration of Sulfate

Batch ID: R382840

Sample ID: HS21041595-02MSD

- MSD is for an unrelated sample (Sulfate)

WetChemistry by Method SM2320B

Batch ID: R382121

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16WW25-210420
Collection Date: 20-Apr-2021 07:25

ANALYTICAL REPORT
WorkOrder:HS21041102
Lab ID:HS21041102-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	22-Apr-2021 13:44
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 13:44
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 13:44
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 13:44
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	22-Apr-2021 13:44
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 13:44
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 13:44
Surr: 1,2-Dichloroethane-d4	*98.5*			**0**	*81-118*	*%REC*	*1*	*22-Apr-2021 13:44*
Surr: 4-Bromofluorobenzene	*91.7*			**0**	*85-114*	*%REC*	*1*	*22-Apr-2021 13:44*
Surr: Dibromofluoromethane	*91.9*			**0**	*80-119*	*%REC*	*1*	*22-Apr-2021 13:44*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*22-Apr-2021 13:44*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	27-Apr-2021 10:58
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	27-Apr-2021 10:58
Methane	**0.0167**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	27-Apr-2021 10:58
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**86.5**		**5.00**	**5.00**	**5.00**	**mg/L**	1	21-Apr-2021 22:55
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**39.1**		**0.500**	**0.500**	**1.00**	**mg/L**	1	30-Apr-2021 20:01
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**3.13**		**0.300**	**1.00**	**1.00**	**mg/L**	10	01-May-2021 00:28
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	21-Apr-2021 16:16
Sulfate	**5,500**		**20.0**	**50.0**	**50.0**	**mg/L**	100	01-May-2021 00:46
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-May-2021 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16WW25-210420-FD
Collection Date: 20-Apr-2021 07:25

ANALYTICAL REPORT
WorkOrder:HS21041102
Lab ID:HS21041102-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	22-Apr-2021 14:05
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 14:05
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 14:05
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 14:05
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	22-Apr-2021 14:05
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 14:05
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 14:05
Surr: 1,2-Dichloroethane-d4	*97.2*			**0**	*81-118*	*%REC*	*1*	*22-Apr-2021 14:05*
Surr: 4-Bromofluorobenzene	*91.1*			**0**	*85-114*	*%REC*	*1*	*22-Apr-2021 14:05*
Surr: Dibromofluoromethane	*92.8*			**0**	*80-119*	*%REC*	*1*	*22-Apr-2021 14:05*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*22-Apr-2021 14:05*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	27-Apr-2021 11:11
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	27-Apr-2021 11:11
Methane	**0.0153**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	27-Apr-2021 11:11
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**77.5**		**5.00**	**5.00**	**5.00**	**mg/L**	1	21-Apr-2021 23:01
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**37.0**		**0.500**	**0.500**	**1.00**	**mg/L**	1	30-Apr-2021 20:16
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**2.75**		**0.300**	**1.00**	**1.00**	**mg/L**	10	01-May-2021 01:06
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	21-Apr-2021 16:34
Sulfate	**5,560**		**20.0**	**50.0**	**50.0**	**mg/L**	100	01-May-2021 01:25
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-May-2021 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041102
Sample ID: 16WW26-210420 Lab ID:HS21041102-03
Collection Date: 20-Apr-2021 08:20 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	22-Apr-2021 15:29
1,1-Dichloroethene	**0.70**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	22-Apr-2021 15:29
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 15:29
cis-1,2-Dichloroethene	**8.7**		**0.20**	**0.50**	**1.0**	**ug/L**	1	22-Apr-2021 15:29
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	22-Apr-2021 15:29
Trichloroethene	**130**		**0.20**	**0.50**	**1.0**	**ug/L**	1	22-Apr-2021 15:29
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 15:29
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*22-Apr-2021 15:29*
Surr: 4-Bromofluorobenzene	*92.5*			**0**	*85-114*	*%REC*	*1*	*22-Apr-2021 15:29*
Surr: Dibromofluoromethane	*94.3*			**0**	*80-119*	*%REC*	*1*	*22-Apr-2021 15:29*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*22-Apr-2021 15:29*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	27-Apr-2021 11:23
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	27-Apr-2021 11:23
Methane	**0.00118**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	27-Apr-2021 11:23
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	5.00	U	5.00	5.00	5.00	mg/L	1	21-Apr-2021 23:05
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**3.54**		**0.500**	**0.500**	**1.00**	**mg/L**	1	30-Apr-2021 20:32
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**1.52**		**0.150**	**0.500**	**0.500**	**mg/L**	5	21-Apr-2021 16:55
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	21-Apr-2021 16:55
Sulfate	**749**		**10.0**	**25.0**	**25.0**	**mg/L**	50	30-Apr-2021 14:24
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-May-2021 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16WW29-210420
Collection Date: 20-Apr-2021 09:10

ANALYTICAL REPORT
WorkOrder:HS21041102
Lab ID:HS21041102-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	22-Apr-2021 14:26
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 14:26
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 14:26
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 14:26
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	22-Apr-2021 14:26
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 14:26
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 14:26
Surr: 1,2-Dichloroethane-d4	*98.5*			**0**	*81-118*	*%REC*	*1*	*22-Apr-2021 14:26*
Surr: 4-Bromofluorobenzene	*94.6*			**0**	*85-114*	*%REC*	*1*	*22-Apr-2021 14:26*
Surr: Dibromofluoromethane	*94.6*			**0**	*80-119*	*%REC*	*1*	*22-Apr-2021 14:26*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*1*	*22-Apr-2021 14:26*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	27-Apr-2021 11:35
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	27-Apr-2021 11:35
Methane	**0.0306**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	27-Apr-2021 11:35
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**41.4**		**5.00**	**5.00**	**5.00**	**mg/L**	1	21-Apr-2021 23:11
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**16.9**		**0.500**	**0.500**	**1.00**	**mg/L**	1	30-Apr-2021 22:01
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**2.35**		**0.150**	**0.500**	**0.500**	**mg/L**	5	21-Apr-2021 17:13
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	21-Apr-2021 17:13
Sulfate	**1,800**		**10.0**	**25.0**	**25.0**	**mg/L**	50	30-Apr-2021 20:34
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-May-2021 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041102
Sample ID: 16WW29-210420-FD Lab ID:HS21041102-05
Collection Date: 20-Apr-2021 09:10 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	22-Apr-2021 14:47
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 14:47
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 14:47
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 14:47
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	22-Apr-2021 14:47
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 14:47
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 14:47
Surr: 1,2-Dichloroethane-d4	*99.2*			**0**	*81-118*	*%REC*	*1*	*22-Apr-2021 14:47*
Surr: 4-Bromofluorobenzene	*93.5*			**0**	*85-114*	*%REC*	*1*	*22-Apr-2021 14:47*
Surr: Dibromofluoromethane	*91.6*			**0**	*80-119*	*%REC*	*1*	*22-Apr-2021 14:47*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*22-Apr-2021 14:47*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	27-Apr-2021 12:01
Ethene	**0.00136**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	27-Apr-2021 12:01
Methane	**0.0302**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	27-Apr-2021 12:01
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**35.4**		**5.00**	**5.00**	**5.00**	**mg/L**	1	21-Apr-2021 23:16
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**16.9**		**0.500**	**0.500**	**1.00**	**mg/L**	1	30-Apr-2021 22:16
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**2.23**		**0.150**	**0.500**	**0.500**	**mg/L**	5	21-Apr-2021 17:34
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	21-Apr-2021 17:34
Sulfate	**1,850**		**10.0**	**25.0**	**25.0**	**mg/L**	50	30-Apr-2021 20:53
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-May-2021 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041102
Sample ID: 16WW30-210420 Lab ID:HS21041102-06
Collection Date: 20-Apr-2021 10:00 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	22-Apr-2021 15:08
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 15:08
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 15:08
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 15:08
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	22-Apr-2021 15:08
Trichloroethene	**11**		**0.20**	**0.50**	**1.0**	**ug/L**	1	22-Apr-2021 15:08
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 15:08
Surr: 1,2-Dichloroethane-d4	*99.2*			**0**	*81-118*	*%REC*	*1*	*22-Apr-2021 15:08*
Surr: 4-Bromofluorobenzene	*90.9*			**0**	*85-114*	*%REC*	*1*	*22-Apr-2021 15:08*
Surr: Dibromofluoromethane	*95.4*			**0**	*80-119*	*%REC*	*1*	*22-Apr-2021 15:08*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*1*	*22-Apr-2021 15:08*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-May-2021 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041102
Sample ID: 16WW55-210420 Lab ID:HS21041102-07
Collection Date: 20-Apr-2021 10:45 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	22-Apr-2021 19:42
1,1-Dichloroethene	**5.4**		**1.0**	**2.5**	**5.0**	**ug/L**	5	22-Apr-2021 19:42
1,2-Dichloroethane	**3.6**	J	**1.0**	**2.5**	**5.0**	**ug/L**	5	22-Apr-2021 19:42
cis-1,2-Dichloroethene	**270**		**1.0**	**2.5**	**5.0**	**ug/L**	5	22-Apr-2021 19:42
Methylene chloride	10	U	2.0	10	10	ug/L	5	22-Apr-2021 19:42
Trichloroethene	**2,200**		**10**	**25**	**50**	**ug/L**	50	22-Apr-2021 20:03
Vinyl chloride	**18**		**1.0**	**2.5**	**5.0**	**ug/L**	5	22-Apr-2021 19:42
Surr: 1,2-Dichloroethane-d4	*96.3*			**0**	*81-118*	*%REC*	*50*	*22-Apr-2021 20:03*
Surr: 1,2-Dichloroethane-d4	*99.6*			**0**	*81-118*	*%REC*	*5*	*22-Apr-2021 19:42*
Surr: 4-Bromofluorobenzene	*92.9*			**0**	*85-114*	*%REC*	*50*	*22-Apr-2021 20:03*
Surr: 4-Bromofluorobenzene	*95.1*			**0**	*85-114*	*%REC*	*5*	*22-Apr-2021 19:42*
Surr: Dibromofluoromethane	*93.9*			**0**	*80-119*	*%REC*	*5*	*22-Apr-2021 19:42*
Surr: Dibromofluoromethane	*91.0*			**0**	*80-119*	*%REC*	*50*	*22-Apr-2021 20:03*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*5*	*22-Apr-2021 19:42*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*50*	*22-Apr-2021 20:03*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	27-Apr-2021 12:15
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	27-Apr-2021 12:15
Methane	**0.00709**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	27-Apr-2021 12:15
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**321**		**5.00**	**5.00**	**5.00**	**mg/L**	1	21-Apr-2021 23:22
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**6.21**		**0.500**	**0.500**	**1.00**	**mg/L**	1	30-Apr-2021 22:33
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**7.73**		**0.150**	**0.500**	**0.500**	**mg/L**	5	21-Apr-2021 17:52
Nitrogen, Nitrate (As N)	**1.10**		**0.150**	**0.500**	**0.500**	**mg/L**	5	21-Apr-2021 17:52
Sulfate	**862**		**10.0**	**25.0**	**25.0**	**mg/L**	50	30-Apr-2021 21:13
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-May-2021 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041102
Sample ID: 16RW10-210420 Lab ID:HS21041102-08
Collection Date: 20-Apr-2021 11:30 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	23-Apr-2021 16:04
1,1-Dichloroethene	**14**		**1.0**	**2.5**	**5.0**	**ug/L**	5	23-Apr-2021 16:04
1,2-Dichloroethane	**24**		**1.0**	**2.5**	**5.0**	**ug/L**	5	23-Apr-2021 16:04
cis-1,2-Dichloroethene	**710**		**1.0**	**2.5**	**5.0**	**ug/L**	5	23-Apr-2021 16:04
Methylene chloride	**8.7**	J	**2.0**	**10**	**10**	**ug/L**	5	23-Apr-2021 16:04
Trichloroethene	**2,400**		**10**	**25**	**50**	**ug/L**	50	23-Apr-2021 17:07
Vinyl chloride	**93**		**1.0**	**2.5**	**5.0**	**ug/L**	5	23-Apr-2021 16:04
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*5*	*23-Apr-2021 16:04*
Surr: 1,2-Dichloroethane-d4	*97.3*			**0**	*81-118*	*%REC*	*50*	*23-Apr-2021 17:07*
Surr: 4-Bromofluorobenzene	*93.0*			**0**	*85-114*	*%REC*	*5*	*23-Apr-2021 16:04*
Surr: 4-Bromofluorobenzene	*94.2*			**0**	*85-114*	*%REC*	*50*	*23-Apr-2021 17:07*
Surr: Dibromofluoromethane	*93.5*			**0**	*80-119*	*%REC*	*5*	*23-Apr-2021 16:04*
Surr: Dibromofluoromethane	*92.0*			**0**	*80-119*	*%REC*	*50*	*23-Apr-2021 17:07*
Surr: Toluene-d8	*110*			**0**	*89-112*	*%REC*	*5*	*23-Apr-2021 16:04*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*50*	*23-Apr-2021 17:07*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	27-Apr-2021 12:27
Ethene	**0.0261**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	27-Apr-2021 12:27
Methane	**0.330**		**0.00268**	**0.0125**	**0.0125**	**mg/L**	25	27-Apr-2021 12:58
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**4.84**		**0.500**	**0.500**	**1.00**	**mg/L**	1	30-Apr-2021 22:49
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-May-2021 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041102
Sample ID: 16RW09-210420 Lab ID:HS21041102-09
Collection Date: 20-Apr-2021 12:15 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	22-Apr-2021 15:50
1,1-Dichloroethene	**4.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	22-Apr-2021 15:50
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 15:50
cis-1,2-Dichloroethene	**160**		**0.20**	**0.50**	**1.0**	**ug/L**	1	22-Apr-2021 15:50
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	22-Apr-2021 15:50
Trichloroethene	**810**		**5.0**	**12**	**25**	**ug/L**	25	23-Apr-2021 17:28
Vinyl chloride	**33**		**0.20**	**0.50**	**1.0**	**ug/L**	1	22-Apr-2021 15:50
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*22-Apr-2021 15:50*
Surr: 1,2-Dichloroethane-d4	*99.5*			**0**	*81-118*	*%REC*	*25*	*23-Apr-2021 17:28*
Surr: 4-Bromofluorobenzene	*93.5*			**0**	*85-114*	*%REC*	*1*	*22-Apr-2021 15:50*
Surr: 4-Bromofluorobenzene	*92.9*			**0**	*85-114*	*%REC*	*25*	*23-Apr-2021 17:28*
Surr: Dibromofluoromethane	*95.1*			**0**	*80-119*	*%REC*	*1*	*22-Apr-2021 15:50*
Surr: Dibromofluoromethane	*93.1*			**0**	*80-119*	*%REC*	*25*	*23-Apr-2021 17:28*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*1*	*22-Apr-2021 15:50*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*25*	*23-Apr-2021 17:28*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	27-Apr-2021 12:38
Ethene	**0.00197**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	27-Apr-2021 12:38
Methane	**0.144**		**0.00107**	**0.00500**	**0.00500**	**mg/L**	10	27-Apr-2021 13:08
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**2.28**		**0.500**	**0.500**	**1.00**	**mg/L**	1	30-Apr-2021 23:23
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-May-2021 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041102
Sample ID: 16IW03-210420 Lab ID:HS21041102-10
Collection Date: 20-Apr-2021 13:05 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	22-Apr-2021 20:24
1,1-Dichloroethene	**46**		**2.0**	**5.0**	**10**	**ug/L**	10	22-Apr-2021 20:24
1,2-Dichloroethane	**6.2**	J	**2.0**	**5.0**	**10**	**ug/L**	10	22-Apr-2021 20:24
cis-1,2-Dichloroethene	**11,000**		**20**	**50**	**100**	**ug/L**	100	22-Apr-2021 20:45
Methylene chloride	**17**	J	**4.0**	**20**	**20**	**ug/L**	10	22-Apr-2021 20:24
Trichloroethene	**8,900**		**20**	**50**	**100**	**ug/L**	100	22-Apr-2021 20:45
Vinyl chloride	**3,700**		**20**	**50**	**100**	**ug/L**	100	22-Apr-2021 20:45
Surr: 1,2-Dichloroethane-d4	*97.6*			**0**	*81-118*	*%REC*	*10*	*22-Apr-2021 20:24*
Surr: 1,2-Dichloroethane-d4	*96.3*			**0**	*81-118*	*%REC*	*100*	*22-Apr-2021 20:45*
Surr: 4-Bromofluorobenzene	*93.8*			**0**	*85-114*	*%REC*	*10*	*22-Apr-2021 20:24*
Surr: 4-Bromofluorobenzene	*93.8*			**0**	*85-114*	*%REC*	*100*	*22-Apr-2021 20:45*
Surr: Dibromofluoromethane	*92.7*			**0**	*80-119*	*%REC*	*10*	*22-Apr-2021 20:24*
Surr: Dibromofluoromethane	*91.6*			**0**	*80-119*	*%REC*	*100*	*22-Apr-2021 20:45*
Surr: Toluene-d8	*110*			**0**	*89-112*	*%REC*	*10*	*22-Apr-2021 20:24*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*100*	*22-Apr-2021 20:45*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	27-Apr-2021 12:48
Ethene	**0.819**		**0.0234**	**0.0500**	**0.100**	**mg/L**	100	27-Apr-2021 13:58
Methane	**1.33**		**0.0107**	**0.0500**	**0.0500**	**mg/L**	100	27-Apr-2021 13:58
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**1,700**		**5.00**	**5.00**	**5.00**	**mg/L**	1	21-Apr-2021 23:35
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**2,860**		**50.0**	**50.0**	**100**	**mg/L**	100	03-May-2021 17:11
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**6.60**		**0.150**	**0.500**	**0.500**	**mg/L**	5	21-Apr-2021 18:13
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	21-Apr-2021 18:13
Sulfate	**44.3**		**1.00**	**2.50**	**2.50**	**mg/L**	5	21-Apr-2021 18:13
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-May-2021 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041102
Sample ID: Trip Blank-210420 Lab ID:HS21041102-11
Collection Date: 20-Apr-2021 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	22-Apr-2021 13:22
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 13:22
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 13:22
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 13:22
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	22-Apr-2021 13:22
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 13:22
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	22-Apr-2021 13:22
Surr: 1,2-Dichloroethane-d4	*95.5*			**0**	*81-118*	*%REC*	*1*	*22-Apr-2021 13:22*
Surr: 4-Bromofluorobenzene	*94.7*			**0**	*85-114*	*%REC*	*1*	*22-Apr-2021 13:22*
Surr: Dibromofluoromethane	*91.1*			**0**	*80-119*	*%REC*	*1*	*22-Apr-2021 13:22*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*22-Apr-2021 13:22*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021 **DATES REPORT**
WorkOrder: HS21041102

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R382121 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS21041102-01	16WW25-210420	20 Apr 2021 07:25			21 Apr 2021 22:55	1
HS21041102-02	16WW25-210420-FD	20 Apr 2021 07:25			21 Apr 2021 23:01	1
HS21041102-03	16WW26-210420	20 Apr 2021 08:20			21 Apr 2021 23:05	1
HS21041102-04	16WW29-210420	20 Apr 2021 09:10			21 Apr 2021 23:11	1
HS21041102-05	16WW29-210420-FD	20 Apr 2021 09:10			21 Apr 2021 23:16	1
HS21041102-07	16WW55-210420	20 Apr 2021 10:45			21 Apr 2021 23:22	1
HS21041102-10	16IW03-210420	20 Apr 2021 13:05			21 Apr 2021 23:35	1
Batch ID: R382206 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21041102-01	16WW25-210420	20 Apr 2021 07:25			21 Apr 2021 16:16	5
HS21041102-02	16WW25-210420-FD	20 Apr 2021 07:25			21 Apr 2021 16:34	5
HS21041102-03	16WW26-210420	20 Apr 2021 08:20			21 Apr 2021 16:55	5
HS21041102-04	16WW29-210420	20 Apr 2021 09:10			21 Apr 2021 17:13	5
HS21041102-05	16WW29-210420-FD	20 Apr 2021 09:10			21 Apr 2021 17:34	5
HS21041102-07	16WW55-210420	20 Apr 2021 10:45			21 Apr 2021 17:52	5
HS21041102-10	16IW03-210420	20 Apr 2021 13:05			21 Apr 2021 18:13	5
Batch ID: R382250 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21041102-11	Trip Blank-210420	20 Apr 2021 00:00			22 Apr 2021 13:22	1
Batch ID: R382250 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21041102-01	16WW25-210420	20 Apr 2021 07:25			22 Apr 2021 13:44	1
HS21041102-02	16WW25-210420-FD	20 Apr 2021 07:25			22 Apr 2021 14:05	1
HS21041102-03	16WW26-210420	20 Apr 2021 08:20			22 Apr 2021 15:29	1
HS21041102-04	16WW29-210420	20 Apr 2021 09:10			22 Apr 2021 14:26	1
HS21041102-05	16WW29-210420-FD	20 Apr 2021 09:10			22 Apr 2021 14:47	1
HS21041102-06	16WW30-210420	20 Apr 2021 10:00			22 Apr 2021 15:08	1
HS21041102-07	16WW55-210420	20 Apr 2021 10:45			22 Apr 2021 20:03	50
HS21041102-07	16WW55-210420	20 Apr 2021 10:45			22 Apr 2021 19:42	5
HS21041102-09	16RW09-210420	20 Apr 2021 12:15			22 Apr 2021 15:50	1
HS21041102-10	16IW03-210420	20 Apr 2021 13:05			22 Apr 2021 20:45	100
HS21041102-10	16IW03-210420	20 Apr 2021 13:05			22 Apr 2021 20:24	10
Batch ID: R382319 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21041102-08	16RW10-210420	20 Apr 2021 11:30			23 Apr 2021 17:07	50
HS21041102-08	16RW10-210420	20 Apr 2021 11:30			23 Apr 2021 16:04	5
HS21041102-09	16RW09-210420	20 Apr 2021 12:15			23 Apr 2021 17:28	25

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041102

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R382623 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS21041102-01	16WW25-210420	20 Apr 2021 07:25			27 Apr 2021 10:58	1
HS21041102-02	16WW25-210420-FD	20 Apr 2021 07:25			27 Apr 2021 11:11	1
HS21041102-03	16WW26-210420	20 Apr 2021 08:20			27 Apr 2021 11:23	1
HS21041102-04	16WW29-210420	20 Apr 2021 09:10			27 Apr 2021 11:35	1
HS21041102-05	16WW29-210420-FD	20 Apr 2021 09:10			27 Apr 2021 12:01	1
HS21041102-07	16WW55-210420	20 Apr 2021 10:45			27 Apr 2021 12:15	1
HS21041102-08	16RW10-210420	20 Apr 2021 11:30			27 Apr 2021 12:58	25
HS21041102-08	16RW10-210420	20 Apr 2021 11:30			27 Apr 2021 12:27	1
HS21041102-09	16RW09-210420	20 Apr 2021 12:15			27 Apr 2021 13:08	10
HS21041102-09	16RW09-210420	20 Apr 2021 12:15			27 Apr 2021 12:38	1
HS21041102-10	16IW03-210420	20 Apr 2021 13:05			27 Apr 2021 13:58	100
HS21041102-10	16IW03-210420	20 Apr 2021 13:05			27 Apr 2021 12:48	1
Batch ID: R382811 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS21041102-01	16WW25-210420	20 Apr 2021 07:25			30 Apr 2021 20:01	1
HS21041102-02	16WW25-210420-FD	20 Apr 2021 07:25			30 Apr 2021 20:16	1
HS21041102-03	16WW26-210420	20 Apr 2021 08:20			30 Apr 2021 20:32	1
Batch ID: R382818 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS21041102-04	16WW29-210420	20 Apr 2021 09:10			30 Apr 2021 22:01	1
HS21041102-05	16WW29-210420-FD	20 Apr 2021 09:10			30 Apr 2021 22:16	1
HS21041102-07	16WW55-210420	20 Apr 2021 10:45			30 Apr 2021 22:33	1
HS21041102-08	16RW10-210420	20 Apr 2021 11:30			30 Apr 2021 22:49	1
HS21041102-09	16RW09-210420	20 Apr 2021 12:15			30 Apr 2021 23:23	1
Batch ID: R382840 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21041102-01	16WW25-210420	20 Apr 2021 07:25			01 May 2021 00:46	100
HS21041102-01	16WW25-210420	20 Apr 2021 07:25			01 May 2021 00:28	10
HS21041102-02	16WW25-210420-FD	20 Apr 2021 07:25			01 May 2021 01:25	100
HS21041102-02	16WW25-210420-FD	20 Apr 2021 07:25			01 May 2021 01:06	10
HS21041102-03	16WW26-210420	20 Apr 2021 08:20			30 Apr 2021 14:24	50
HS21041102-04	16WW29-210420	20 Apr 2021 09:10			30 Apr 2021 20:34	50
HS21041102-05	16WW29-210420-FD	20 Apr 2021 09:10			30 Apr 2021 20:53	50
HS21041102-07	16WW55-210420	20 Apr 2021 10:45			30 Apr 2021 21:13	50
Batch ID: R382895 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS21041102-10	16IW03-210420	20 Apr 2021 13:05			03 May 2021 17:11	100

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041102

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R383059 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS21041102-01	16WW25-210420	20 Apr 2021 07:25			05 May 2021 16:22	1
HS21041102-02	16WW25-210420-FD	20 Apr 2021 07:25			05 May 2021 16:22	1
HS21041102-03	16WW26-210420	20 Apr 2021 08:20			05 May 2021 16:22	1
HS21041102-04	16WW29-210420	20 Apr 2021 09:10			05 May 2021 16:22	1
HS21041102-05	16WW29-210420-FD	20 Apr 2021 09:10			05 May 2021 16:22	1
HS21041102-06	16WW30-210420	20 Apr 2021 10:00			05 May 2021 16:22	1
HS21041102-07	16WW55-210420	20 Apr 2021 10:45			05 May 2021 16:22	1
HS21041102-08	16RW10-210420	20 Apr 2021 11:30			05 May 2021 16:22	1
HS21041102-09	16RW09-210420	20 Apr 2021 12:15			05 May 2021 16:22	1
HS21041102-10	16IW03-210420	20 Apr 2021 13:05			05 May 2021 16:22	1

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041102

QC BATCH REPORT

Batch ID: R382623 (0) **Instrument: FID-4** **Method: DISSOLVED GASES BY RSK-175**

MBLK Sample ID: **MBLK-210427** Units: **mg/L** Analysis Date: **27-Apr-2021 09:48**
Client ID: Run ID: **FID-4_382623** SeqNo: **6067727** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000500	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000500	0.000500								U

LCS Sample ID: **LCS-210427** Units: **mg/L** Analysis Date: **27-Apr-2021 09:57**
Client ID: Run ID: **FID-4_382623** SeqNo: **6067728** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0214	0.00100	0.01804	0	119	75 - 125				
Ethene	0.0184	0.00100	0.0168	0	109	75 - 125				
Methane	0.00936	0.000500	0.009647	0	97.0	75 - 125				

LCSD Sample ID: **LCSD-210427** Units: **mg/L** Analysis Date: **27-Apr-2021 10:08**
Client ID: Run ID: **FID-4_382623** SeqNo: **6067729** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0209	0.00100	0.01804	0	116	75 - 125	0.02138	2.36	30	
Ethene	0.0178	0.00100	0.0168	0	106	75 - 125	0.01836	3.2	30	
Methane	0.00980	0.000500	0.009647	0	102	75 - 125	0.009361	4.55	30	

DUP Sample ID: **HS21041132-05DUP** Units: **mg/L** Analysis Date: **27-Apr-2021 10:35**
Client ID: Run ID: **FID-4_382623** SeqNo: **6067731** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000500	0.00100					0	0	30	U
Ethene	0.000500	0.00100					0	0	30	U
Methane	0.00353	0.000500					0.003447	2.5	30	

The following samples were analyzed in this batch:

HS21041102-01	HS21041102-02	HS21041102-03	HS21041102-04
HS21041102-05	HS21041102-07	HS21041102-08	HS21041102-09
HS21041102-10			

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041102

QC BATCH REPORT

Batch ID: R382250 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210422** Units: **ug/L** Analysis Date: **22-Apr-2021 13:01**
Client ID: Run ID: **VOA6_382250** SeqNo: **6058085** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*47.94*	*1.0*	*50*	*0*	*95.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*46*	*1.0*	*50*	*0*	*92.0*	*85 - 114*				
Surr: Dibromofluoromethane	*46.53*	*1.0*	*50*	*0*	*93.1*	*80 - 119*				
Surr: Toluene-d8	*53.88*	*1.0*	*50*	*0*	*108*	*89 - 112*				

LCS Sample ID: **VLCSW-210422** Units: **ug/L** Analysis Date: **22-Apr-2021 12:19**
Client ID: Run ID: **VOA6_382250** SeqNo: **6058084** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	21.25	1.0	20	0	106	80 - 119				
1,1-Dichloroethene	19.24	1.0	20	0	96.2	71 - 131				
1,2-Dichloroethane	20.08	1.0	20	0	100	73 - 128				
cis-1,2-Dichloroethene	19.96	1.0	20	0	99.8	78 - 123				
Methylene chloride	21.99	2.0	20	0	110	74 - 124				
Trichloroethene	19.95	1.0	20	0	99.8	79 - 123				
Vinyl chloride	21.2	1.0	20	0	106	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.73*	*1.0*	*50*	*0*	*105*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.13*	*1.0*	*50*	*0*	*100*	*85 - 114*				
Surr: Dibromofluoromethane	*50.82*	*1.0*	*50*	*0*	*102*	*80 - 119*				
Surr: Toluene-d8	*51.32*	*1.0*	*50*	*0*	*103*	*89 - 112*				

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041102

QC BATCH REPORT

Batch ID: R382250 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS21041102-04MS** Units: **ug/L** Analysis Date: **22-Apr-2021 16:11**
Client ID: **16WW29-210420** Run ID: **VOA6_382250** SeqNo: **6058094** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.97	1.0	20	0	94.9	80 - 119				
1,1-Dichloroethene	18.74	1.0	20	0	93.7	71 - 131				
1,2-Dichloroethane	18.28	1.0	20	0	91.4	73 - 128				
cis-1,2-Dichloroethene	18.74	1.0	20	0	93.7	78 - 123				
Methylene chloride	19.38	2.0	20	0	96.9	74 - 124				
Trichloroethene	21.57	1.0	20	0	108	79 - 123				
Vinyl chloride	21.18	1.0	20	0	106	58 - 137				
Surr: 1,2-Dichloroethane-d4	*47.79*	*1.0*	*50*	*0*	*95.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.4*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*46.01*	*1.0*	*50*	*0*	*92.0*	*80 - 119*				
Surr: Toluene-d8	*52.35*	*1.0*	*50*	*0*	*105*	*89 - 112*				

MSD Sample ID: **HS21041102-04MSD** Units: **ug/L** Analysis Date: **22-Apr-2021 16:32**
Client ID: **16WW29-210420** Run ID: **VOA6_382250** SeqNo: **6058095** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.82	1.0	20	0	94.1	80 - 119	18.97	0.84	20	
1,1-Dichloroethene	18.2	1.0	20	0	91.0	71 - 131	18.74	2.92	20	
1,2-Dichloroethane	18.15	1.0	20	0	90.7	73 - 128	18.28	0.746	20	
cis-1,2-Dichloroethene	17.77	1.0	20	0	88.8	78 - 123	18.74	5.33	20	
Methylene chloride	18.45	2.0	20	0	92.3	74 - 124	19.38	4.9	20	
Trichloroethene	19.89	1.0	20	0	99.4	79 - 123	21.57	8.11	20	
Vinyl chloride	20.69	1.0	20	0	103	58 - 137	21.18	2.31	20	
Surr: 1,2-Dichloroethane-d4	*46.31*	*1.0*	*50*	*0*	*92.6*	*81 - 118*	*47.79*	*3.15*	*20*	
Surr: 4-Bromofluorobenzene	*48.8*	*1.0*	*50*	*0*	*97.6*	*85 - 114*	*51.4*	*5.19*	*20*	
Surr: Dibromofluoromethane	*46.46*	*1.0*	*50*	*0*	*92.9*	*80 - 119*	*46.01*	*0.96*	*20*	
Surr: Toluene-d8	*52.24*	*1.0*	*50*	*0*	*104*	*89 - 112*	*52.35*	*0.205*	*20*	

The following samples were analyzed in this batch:

HS21041102-01	HS21041102-02	HS21041102-03	HS21041102-04
HS21041102-05	HS21041102-06	HS21041102-07	HS21041102-09
HS21041102-10	HS21041102-11		

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041102

QC BATCH REPORT

Batch ID: R382319 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210423** Units: **ug/L** Analysis Date: **23-Apr-2021 12:54**
Client ID: Run ID: **VOA6_382319** SeqNo: **6059743** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*48.59*	*1.0*	*50*	*0*	*97.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*45.27*	*1.0*	*50*	*0*	*90.5*	*85 - 114*				
Surr: Dibromofluoromethane	*45.98*	*1.0*	*50*	*0*	*92.0*	*80 - 119*				
Surr: Toluene-d8	*53.8*	*1.0*	*50*	*0*	*108*	*89 - 112*				

LCS Sample ID: **VLCSW-210423** Units: **ug/L** Analysis Date: **23-Apr-2021 12:12**
Client ID: Run ID: **VOA6_382319** SeqNo: **6059742** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	22.45	1.0	20	0	112	80 - 119				
1,1-Dichloroethene	21.76	1.0	20	0	109	71 - 131				
1,2-Dichloroethane	21.06	1.0	20	0	105	73 - 128				
cis-1,2-Dichloroethene	22.4	1.0	20	0	112	78 - 123				
Methylene chloride	23.68	2.0	20	0	118	74 - 124				
Trichloroethene	21.93	1.0	20	0	110	79 - 123				
Vinyl chloride	23.85	1.0	20	0	119	58 - 137				
Surr: 1,2-Dichloroethane-d4	*54.43*	*1.0*	*50*	*0*	*109*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.54*	*1.0*	*50*	*0*	*107*	*85 - 114*				
Surr: Dibromofluoromethane	*53.15*	*1.0*	*50*	*0*	*106*	*80 - 119*				
Surr: Toluene-d8	*52.72*	*1.0*	*50*	*0*	*105*	*89 - 112*				

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041102

QC BATCH REPORT

Batch ID: R382319 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS21041135-03MS** Units: **ug/L** Analysis Date: **23-Apr-2021 16:25**
Client ID: Run ID: **VOA6_382319** SeqNo: **6059753** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.84	1.0	20	0	89.2	80 - 119				
1,1-Dichloroethene	19	1.0	20	0	95.0	71 - 131				
1,2-Dichloroethane	18.35	1.0	20	0	91.8	73 - 128				
cis-1,2-Dichloroethene	17.91	1.0	20	0	89.6	78 - 123				
Methylene chloride	18.11	2.0	20	0	90.5	74 - 124				
Trichloroethene	20.15	1.0	20	0	101	79 - 123				
Vinyl chloride	21.08	1.0	20	0	105	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.37*	*1.0*	*50*	*0*	*92.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.46*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*45.85*	*1.0*	*50*	*0*	*91.7*	*80 - 119*				
Surr: Toluene-d8	*51.29*	*1.0*	*50*	*0*	*103*	*89 - 112*				

MSD Sample ID: **HS21041135-03MSD** Units: **ug/L** Analysis Date: **23-Apr-2021 16:46**
Client ID: Run ID: **VOA6_382319** SeqNo: **6059754** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.92	1.0	20	0	89.6	80 - 119	17.84	0.443	20	
1,1-Dichloroethene	17.94	1.0	20	0	89.7	71 - 131	19	5.74	20	
1,2-Dichloroethane	17.62	1.0	20	0	88.1	73 - 128	18.35	4.06	20	
cis-1,2-Dichloroethene	17.03	1.0	20	0	85.2	78 - 123	17.91	5.03	20	
Methylene chloride	18.42	2.0	20	0	92.1	74 - 124	18.11	1.71	20	
Trichloroethene	18.81	1.0	20	0	94.1	79 - 123	20.15	6.88	20	
Vinyl chloride	19.65	1.0	20	0	98.3	58 - 137	21.08	7	20	
Surr: 1,2-Dichloroethane-d4	*47.83*	*1.0*	*50*	*0*	*95.7*	*81 - 118*	*46.37*	*3.12*	*20*	
Surr: 4-Bromofluorobenzene	*49.66*	*1.0*	*50*	*0*	*99.3*	*85 - 114*	*50.46*	*1.6*	*20*	
Surr: Dibromofluoromethane	*45.54*	*1.0*	*50*	*0*	*91.1*	*80 - 119*	*45.85*	*0.68*	*20*	
Surr: Toluene-d8	*51.67*	*1.0*	*50*	*0*	*103*	*89 - 112*	*51.29*	*0.733*	*20*	

The following samples were analyzed in this batch: HS21041102-08 HS21041102-09

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041102

QC BATCH REPORT

Batch ID: R382121 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM2320B**

MBLK Sample ID: **WBLKW2-210421** Units: **mg/L** Analysis Date: **21-Apr-2021 21:43**
Client ID: Run ID: **ManTech01_382121** SeqNo: **6054847** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **LCS2-210421** Units: **mg/L** Analysis Date: **21-Apr-2021 21:52**
Client ID: Run ID: **ManTech01_382121** SeqNo: **6054848** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1027	5.00	1000	0	103	85 - 115				

LCSD Sample ID: **LCSD2-210421** Units: **mg/L** Analysis Date: **21-Apr-2021 22:01**
Client ID: Run ID: **ManTech01_382121** SeqNo: **6054849** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1059	5.00	1000	0	106	85 - 115	1027	3.1	20	

DUP Sample ID: **HS21040859-08DUP** Units: **mg/L** Analysis Date: **21-Apr-2021 22:12**
Client ID: Run ID: **ManTech01_382121** SeqNo: **6054851** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	168.4	5.00					169.7	0.769	20	

The following samples were analyzed in this batch:

HS21041102-01	HS21041102-02	HS21041102-03	HS21041102-04
HS21041102-05	HS21041102-07	HS21041102-10	

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041102

QC BATCH REPORT

Batch ID: R382206 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **21-Apr-2021 15:37**
Client ID: Run ID: **ICS-Integrion_382206** SeqNo: **6056702** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **21-Apr-2021 15:56**
Client ID: Run ID: **ICS-Integrion_382206** SeqNo: **6056703** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.66	0.100	4	0	91.5	80 - 120				
Nitrogen, Nitrate (As N)	3.753	0.100	4	0	93.8	80 - 120				
Sulfate	19.12	0.500	20	0	95.6	80 - 120				

MS Sample ID: **HS21041102-03MS** Units: **mg/L** Analysis Date: **21-Apr-2021 19:30**
Client ID: **16WW26-210420** Run ID: **ICS-Integrion_382206** SeqNo: **6056713** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	10.42	0.500	10	1.517	89.0	80 - 120				
Nitrogen, Nitrate (As N)	10.22	0.500	10	0	102	80 - 120				
Sulfate	667.8	2.50	50	644.6	46.4	80 - 120				SEO

MSD Sample ID: **HS21041102-03MSD** Units: **mg/L** Analysis Date: **21-Apr-2021 19:48**
Client ID: **16WW26-210420** Run ID: **ICS-Integrion_382206** SeqNo: **6056714** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	10.44	0.500	10	1.517	89.2	80 - 120	10.42	0.249	20	
Nitrogen, Nitrate (As N)	10.22	0.500	10	0	102	80 - 120	10.22	0.0196	20	
Sulfate	671.8	2.50	50	644.6	54.4	80 - 120	667.8	0.597	20	SEO

The following samples were analyzed in this batch:

HS21041102-01	HS21041102-02	HS21041102-03	HS21041102-04
HS21041102-05	HS21041102-07	HS21041102-10	

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041102

QC BATCH REPORT

Batch ID: R382811 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **MBLK-04302021** Units: **mg/L** Analysis Date: **30-Apr-2021 16:40**
Client ID: Run ID: **TOC_04_382811** SeqNo: **6071176** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	0.500	1.00								U

LCS Sample ID: **LCS-04302021** Units: **mg/L** Analysis Date: **30-Apr-2021 16:55**
Client ID: Run ID: **TOC_04_382811** SeqNo: **6071177** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.507	1.00	10	0	95.1	85 - 115				

LCSD Sample ID: **LCSD-04302021** Units: **mg/L** Analysis Date: **30-Apr-2021 17:10**
Client ID: Run ID: **TOC_04_382811** SeqNo: **6071178** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.413	1.00	10	0	94.1	85 - 115	9.507	0.994	20	

MS Sample ID: **HS21041369-01MS** Units: **mg/L** Analysis Date: **30-Apr-2021 17:39**
Client ID: Run ID: **TOC_04_382811** SeqNo: **6071180** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	22.25	1.00	10	11.56	107	80 - 120				

The following samples were analyzed in this batch: HS21041102-01 HS21041102-02 HS21041102-03

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041102

QC BATCH REPORT

Batch ID: R382818 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **MBLK2-04302021** Units: **mg/L** Analysis Date: **30-Apr-2021 21:16**
Client ID: Run ID: **TOC_04_382818** SeqNo: **6071454** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	0.500	1.00								U

LCS Sample ID: **LCS2-04302021** Units: **mg/L** Analysis Date: **30-Apr-2021 21:31**
Client ID: Run ID: **TOC_04_382818** SeqNo: **6071455** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.629	1.00	10	0	96.3	85 - 115				

LCSD Sample ID: **LCSD2-04302021** Units: **mg/L** Analysis Date: **30-Apr-2021 21:46**
Client ID: Run ID: **TOC_04_382818** SeqNo: **6071456** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.621	1.00	10	0	96.2	85 - 115	9.629	0.0831	20	

MS Sample ID: **HS21041102-08MS** Units: **mg/L** Analysis Date: **30-Apr-2021 23:07**
Client ID: **16RW10-210420** Run ID: **TOC_04_382818** SeqNo: **6071461** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	15.48	1.00	10	4.841	106	80 - 120				

The following samples were analyzed in this batch: HS21041102-04 HS21041102-05 HS21041102-07 HS21041102-08 HS21041102-09

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041102

QC BATCH REPORT

Batch ID: R382840 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **01-May-2021 08:23**
Client ID: Run ID: **ICS-Integrion_382840** SeqNo: **6071997** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **01-May-2021 08:41**
Client ID: Run ID: **ICS-Integrion_382840** SeqNo: **6071998** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.528	0.100	4	0	88.2	80 - 120				
Sulfate	19.12	0.500	20	0	95.6	80 - 120				

MS Sample ID: **HS21041595-02MS** Units: **mg/L** Analysis Date: **30-Apr-2021 13:47**
Client ID: Run ID: **ICS-Integrion_382840** SeqNo: **6072007** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.772	0.100	2	0.8359	96.8	80 - 120				
Sulfate	294.5	0.500	10	285	95.1	80 - 120				EO

MSD Sample ID: **HS21041595-02MSD** Units: **mg/L** Analysis Date: **30-Apr-2021 14:06**
Client ID: Run ID: **ICS-Integrion_382840** SeqNo: **6072033** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.929	0.100	2	0.8359	105	80 - 120	2.772	5.52	20	
Sulfate	298.2	0.500	10	285	132	80 - 120	294.5	1.25	20	SEO

The following samples were analyzed in this batch: HS21041102-01 HS21041102-02 HS21041102-03 HS21041102-04 HS21041102-05 HS21041102-07

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041102

QC BATCH REPORT

Batch ID: R382895 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **MBLK-05032021** Units: **mg/L** Analysis Date: **03-May-2021 16:25**
Client ID: Run ID: **TOC_04_382895** SeqNo: **6073620** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	0.500	1.00								U

LCS Sample ID: **LCS-05032021** Units: **mg/L** Analysis Date: **03-May-2021 16:41**
Client ID: Run ID: **TOC_04_382895** SeqNo: **6073621** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.38	1.00	10	0	104	85 - 115				

LCSD Sample ID: **LCSD-05032021** Units: **mg/L** Analysis Date: **03-May-2021 16:57**
Client ID: Run ID: **TOC_04_382895** SeqNo: **6073622** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.36	1.00	10	0	104	85 - 115	10.38	0.193	20	

MS Sample ID: **HS21041169-03MS** Units: **mg/L** Analysis Date: **03-May-2021 19:50**
Client ID: Run ID: **TOC_04_382895** SeqNo: **6073633** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	780.7	1.00	10	784.1	-34.0	80 - 120				SEO

The following samples were analyzed in this batch: HS21041102-10

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: **HS21041102**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	21-022-0	26-Mar-2022
Dept of Defense	PJLA L20-507-R2	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2021-2022	30-Apr-2022
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2021	31-Dec-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-21-27	30-Apr-2022

ALS Houston, US Date: 05-May-21

Sample Receipt Checklist

Work Order ID: HS21041102 **Date/Time Received:** 21-Apr-2021 10:40

Client Name: CBI-Houston **Received by:** Jared R. Makan

Completed By:	/S/ Paresh M. Giga	21-Apr-2021 15:23	**Reviewed by:**	/S/ RJ Modashia	21-Apr-2021 21:30
	eSignature	Date/Time		eSignature	Date/Time

Matrices: **GW/Water** Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.8C U/c	IR31
Cooler(s)/Kit(s):	46602	
Date/Time sample(s) sent to storage:	4/21/2021 15:45	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: RJ Modashia

Project: APTIM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 16 April 2021**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. / Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16WW25-210420	WG	4/20/21/0725		10	X	X	X	X	X	X					
16WW25-210420-FD	WG	4/20/21/0725		10	X	X	X	X	X	X					
16WW26-210420	WG	4/20/21/0820		10	X	X	X	X	X	X					
16WW29-210420	WG	4/20/21/0910		10	X	X	X	X	X	X					
16WW29-210420-FD	WG	4/20/21/0910		10	X	X	X	X	X	X					
16WW30-210420	WG	4/20/21/1000		4	X					X					
16WW55-210420	WG	4/20/21/1045		10	X	X	X	X	X	X					
16RW10-210420	WG	4/20/21/1130		9	X	X	X		49	X					

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	4/20/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Hunsaker	4/21/21	0740							

Remarks: Color 10.0 1427
Temp 1.8°C CFV

HS21041102

Aptim Environmental & Infrastructure, Inc.
Longhorn Army Ammunition Plant 16 April 202

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Project: APTIM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 16 April 2021**

Prepared By: Scott Beesinger

P.O. Number

HS21041102

Aptim Environmental & Infrastructure, Inc.
Longhorn Army Ammunition Plant 16 April 2021

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preserv etc.)
16RW09-210420	WG	4/20/21/1215		9	X	X	X		SB~~X~~	X					
16IW03-210420	WG	4/20/21/1305		10	X	X	X	X	X	X					
TRIPBLANK-210420	W	4/20/21		2	X										

Additional Remarks: **Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	4/20/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
S Wilcox	4/21/21	10:00							

Remarks:

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

ALS
10450 Stancli Rd., Suite 210
Houston, Tex. 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5687

CUSTODY SEAL

Date: 4/20/21 Time: 1435
Name: Scott Beesinger
Company: Aptim

Seal Broken By:

Date:

ALS

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 29MAR21
ACTWGT: 1.00 LB MAN
CAD: 0221247/CAFE3409
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 630-5656
REF: LHAAP-80 77443-RJ

RMA:

FedEx Express

FedEx
TRK# 0221 9473 0841 7384

RETURNS MON-SAT
WED - 21 APR AA
PRIORITY OVERNIGHT

May 05, 2021 Service Request No:E2100459

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: HS21041102

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory April 21, 2021
For your reference, these analyses have been assigned our service request number **E2100459.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100459
Project:	HS21041102	**Date Received:**	04/21/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Ten samples were received for analysis at ALS Environmental in Houston on 04/21/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100261: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch. The MS/MSD was performed on an unrelated sample. The LCS/DLCS recoveries are within QC limits.

DoD certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2100459
Project: HS21041102

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100459-001	16WW25-210420	4/20/2021	0725
E2100459-002	16WW25-210420-FD	4/20/2021	0725
E2100459-003	16WW26-210420	4/20/2021	0820
E2100459-004	16WW29-210420	4/20/2021	0910
E2100459-005	16WW29-210420-FD	4/20/2021	0910
E2100459-006	16WW30-210420	4/20/2021	1000
E2100459-007	16WW55-210420	4/20/2021	1045
E2100459-008	16RW10-210420	4/20/2021	1130
E2100459-009	16RW09-210420	4/20/2021	1215
E2100459-010	16IW03-210420	4/20/2021	1305

Service Request Summary

Folder #: **E2100459**
Client Name: ALS Environmental - US
Project Name: HS21041102
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 04/21/21
Internal Due Date: 5/5/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21041102
EDD: No EDD Specified

10 125 mL-Plastic Bottle Plastic
Location: EHRMS-AirArch 1
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100459-001	16WW25-210420	Ground Water	04/20/21 0725	**IV**
E2100459-002	16WW25-210420-FD	Ground Water	04/20/21 0725	**IV**
E2100459-003	16WW26-210420	Ground Water	04/20/21 0820	**IV**
E2100459-004	16WW29-210420	Ground Water	04/20/21 0910	**IV**
E2100459-005	16WW29-210420-FD	Ground Water	04/20/21 0910	**IV**
E2100459-006	16WW30-210420	Ground Water	04/20/21 1000	**IV**
E2100459-007	16WW55-210420	Ground Water	04/20/21 1045	**IV**
E2100459-008	16RW10-210420	Ground Water	04/20/21 1130	**IV**
E2100459-009	16RW09-210420	Ground Water	04/20/21 1215	**IV**
E2100459-010	16IW03-210420	Ground Water	04/20/21 1305	**IV**

Service Request Summary

Folder #: **E2100459**
Client Name: ALS Environmental - US
Project Name: HS21041102
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 04/21/21
Internal Due Date: 5/5/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21041102
EDD: No EDD Specified

10 125 mL-Plastic Bottle Plastic
Location: EHRMS-AirArch 1
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	10	Level II due 5/5, IV due 5/12

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

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ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	21-022-0	3/26/2022
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2021-2022	4/30/2022
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Louisiana Department of Health and Hospitals	LA028-2021	12/31/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Minnesota Department of Health	2021671	12/31/2021
Nevada Department of Concervation and Natural Resources	TX026932021-4	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209421	4/24/2022
New Jersey Department of Environmental Protection	TX008	6/30/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2021	4/30/2022
United States Department of Agriculture	P330-19-00299	10/10/2022

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

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Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **15963**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS21041102
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21041102-01**	**16WW25-210420**	**Groundwater**	**20 Apr 2021 07:25**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021
2.	**HS21041102-02**	**16WW25-210420-FD**	**Groundwater**	**20 Apr 2021 07:25**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021
3.	**HS21041102-03**	**16WW26-210420**	**Groundwater**	**20 Apr 2021 08:20**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021
4.	**HS21041102-04**	**16WW29-210420**	**Groundwater**	**20 Apr 2021 09:10**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021
5.	**HS21041102-05**	**16WW29-210420-FD**	**Groundwater**	**20 Apr 2021 09:10**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021
6.	**HS21041102-06**	**16WW30-210420**	**Groundwater**	**20 Apr 2021 10:00**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021
7.	**HS21041102-07**	**16WW55-210420**	**Groundwater**	**20 Apr 2021 10:45**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021
8.	**HS21041102-08**	**16RW10-210420**	**Groundwater**	**20 Apr 2021 11:30**

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15963**

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021
9.	**HS21041102-09**	**16RW09-210420**	**Groundwater**	**20 Apr 2021 12:15**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021
10.	**HS21041102-10**	**16IW03-210420**	**Groundwater**	**20 Apr 2021 13:05**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: _____

Received By: _____ Date/Time: 4/21/21 1946

Cooler ID(s): _____ Temperature(s): _____

Cooler Receipt Form

ALS Environmental

Project Chemist CA

Client/Project ALS-HI

Thermometer ID 1D51

Date/Time Received: 4/21/21 Initials: CA Date/Time Logged in: 4/21/21 Initials CA

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ ALS Courier ○ Client
2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ✓ No
   Were they intact? ○ Yes ○ No ✓ N/A
   Were they signed and dated? ○ Yes ○ No ✓ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ✓ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		4/21/21	1440	CA	0.8	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No
10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 378422 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 4/30/21 10:00

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100458-001	LH18/24-SP650_042021_BIX	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2100459-001	16WW25-210420	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2100459-002	16WW25-210420-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2100459-003	16WW26-210420	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100459-004	16WW29-210420	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100459-005	16WW29-210420-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100459-006	16WW30-210420	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2100459-007	16WW55-210420	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2100459-008	16RW10-210420	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2100459-009	16RW09-210420	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2100459-010	16IW03-210420	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2100486-001	43MW03	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2100486-002	43MW03-DUP	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2100486-003	43MW04	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2100486-004	43MW05	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2100486-005	43MW06	.01	6850/ClO4 DOD			Ground Water	10mL	
17	E2100486-006	EB041621	.01	6850/ClO4 DOD			Ground Water	10mL	
18	E2100486-007	43MW01	.01	6850/ClO4 DOD			Ground Water	10mL	
19	EQ2100261-01	MB		6850/ClO4 DOD			Liquid	10mL	
20	EQ2100261-02	LCS		6850/ClO4 DOD			Liquid	10mL	
21	EQ2100261-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
22	EQ2100261-04	43MW01 MS	.01	6850/ClO4 DOD			Liquid	10mL	
23	EQ2100261-05	43MW01 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100261-02	1.00µL	EQ2100261-03	1.00µL	EQ2100261-04	1.00µL	EQ2100261-05	1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100458-001	100.00µL	E2100459-001	100.00µL	E2100459-002	100.00µL	E2100459-003	100.00µL	E2100459-004	100.00µL	E2100459-005	100.00µL
E2100459-006	100.00µL	E2100459-007	100.00µL	E2100459-008	100.00µL	E2100459-009	100.00µL	E2100459-010	100.00µL	E2100486-001	100.00µL
E2100486-002	100.00µL	E2100486-003	100.00µL	E2100486-004	100.00µL	E2100486-005	100.00µL	E2100486-006	100.00µL	E2100486-007	100.00µL
EQ2100261-01	100.00µL	EQ2100261-02	100.00µL	EQ2100261-03	100.00µL	EQ2100261-04	100.00µL	EQ2100261-05	100.00µL		

Preparation Information Benchsheet

Prep Run#: 378422 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 4/30/21 10:00

Preparation Steps

Step: Preparation
Started: 4/30/21 10:00
Finished: 4/30/21 12:00
By: KBROWN
Comments

Comments: _____

Reviewed By: KB Date: 4/30/21

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined

Received By: _____ Date: _____ Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100459
Project:	HS21041102	**Date Collected:**	4/20/21 0725
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16WW25-210420	**Units:**	µg/L
Lab Code:	E2100459-001	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.500	0.250	0.125	5	4/30/21	5/1/21 13:14	378422	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100459
Project:	HS21041102	**Date Collected:**	4/20/21 0725
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16WW25-210420-FD	**Units:**	µg/L
Lab Code:	E2100459-002	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.500	0.250	0.125	5	4/30/21	5/1/21 13:23	378422	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100459
Project:	HS21041102	**Date Collected:**	4/20/21 0820
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16WW26-210420	**Units:**	µg/L
Lab Code:	E2100459-003	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/30/21	4/30/21 16:19	378422	722059	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100459
Project:	HS21041102	**Date Collected:**	4/20/21 0910
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16WW29-210420	**Units:**	µg/L
Lab Code:	E2100459-004	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/30/21	4/30/21 16:29	378422	722059	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100459
Project:	HS21041102	**Date Collected:**	4/20/21 0910
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16WW29-210420-FD	**Units:**	µg/L
Lab Code:	E2100459-005	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/30/21	4/30/21 16:47	378422	722059	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100459
Project:	HS21041102	**Date Collected:**	4/20/21 1000
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16WW30-210420	**Units:**	µg/L
Lab Code:	E2100459-006	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/30/21	4/30/21 16:57	378422	722059	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100459
Project:	HS21041102	**Date Collected:**	4/20/21 1045
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16WW55-210420	**Units:**	µg/L
Lab Code:	E2100459-007	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**198**		1.00	0.500	0.250	10	4/30/21	5/1/21 13:32	378422	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100459
Project:	HS21041102	**Date Collected:**	4/20/21 1130
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16RW10-210420	**Units:**	µg/L
Lab Code:	E2100459-008	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**36.5**		0.200	0.100	0.0500	2	4/30/21	5/1/21 13:42	378422	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100459
Project:	HS21041102	**Date Collected:**	4/20/21 1215
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16RW09-210420	**Units:**	µg/L
Lab Code:	E2100459-009	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.241**		0.100	0.0500	0.0250	1	4/30/21	4/30/21 17:25	378422	722059	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100459
Project:	HS21041102	**Date Collected:**	4/20/21 1305
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16IW03-210420	**Units:**	µg/L
Lab Code:	E2100459-010	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.754**	J	1.00	0.500	0.250	10	4/30/21	5/1/21 13:51	378422	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100459
Project:	HS21041102	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100261-01	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/30/21	4/30/21 15:04	378422	722059	

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21041102
Sample Matrix: Ground Water

Service Request: E2100459
Date Analyzed: 4/30/21

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Units: µg/L
Basis: As Received

Extraction Lot: 378422

	Lab Control Sample EQ2100261-02			Duplicate Lab Control Sample EQ2100261-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.104	0.100	104	0.109	0.100	109	84 - 119	5	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100459
Project:	HS21041102	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100261-02	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.104**		0.100	0.0500	0.0250	1	4/30/21	4/30/21 15:13	378422	722059	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100459
Project:	HS21041102	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100261-03	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.109**		0.100	0.0500	0.0250	1	4/30/21	4/30/21 15:23	378422	722059	

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Houston, TX 77099
T: +1 281 530 5656
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May 10, 2021

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
10333 Richmond Ave
Ste 1030
Houston, TX 77042

Work Order: **HS21041132**

Laboratory Results for: **Longhorn Army Ammunition Plant LHAAP 16 April 2021**

Dear Vicki Graves ,

ALS Environmental received 8 sample(s) on Apr 21, 2021 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
Work Order: HS21041132

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21041132-01	16EW02-210419	Groundwater		19-Apr-2021 07:35	21-Apr-2021 10:40	☐
HS21041132-02	16EW04-210419	Groundwater		19-Apr-2021 08:20	21-Apr-2021 10:40	☐
HS21041132-03	16EW08-210419	Groundwater		19-Apr-2021 09:05	21-Apr-2021 10:40	☐
HS21041132-04	16WW13-210419	Groundwater		19-Apr-2021 09:50	21-Apr-2021 10:40	☐
HS21041132-05	16WW42-210419	Groundwater		19-Apr-2021 10:30	21-Apr-2021 10:40	☐
HS21041132-06	16RW05-210419	Groundwater		19-Apr-2021 11:15	21-Apr-2021 10:40	☐
HS21041132-07	16RW06-210419	Groundwater		19-Apr-2021 12:00	21-Apr-2021 10:40	☐
HS21041132-08	16RW07-210419	Groundwater		19-Apr-2021 12:40	21-Apr-2021 10:40	☐

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
Work Order: HS21041132

Work Order Comments

• The analysis for Perchlorate was subcontracted our ALS Houston TX, High Resolution Lab. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R382623

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R382319

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM5310B

Batch ID: R382818

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21041132
Sample ID: 16EW02-210419 Lab ID:HS21041132-01
Collection Date: 19-Apr-2021 07:35 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	25	U	7.5	25	25	ug/L	25	23-Apr-2021 20:17
1,1-Dichloroethene	**64**		**5.0**	**12**	**25**	**ug/L**	25	23-Apr-2021 20:17
1,2-Dichloroethane	**35**		**5.0**	**12**	**25**	**ug/L**	25	23-Apr-2021 20:17
cis-1,2-Dichloroethene	**18,000**		**50**	**120**	**250**	**ug/L**	250	23-Apr-2021 20:38
Methylene chloride	**41**	J	**10**	**50**	**50**	**ug/L**	25	23-Apr-2021 20:17
Trichloroethene	**23,000**		**50**	**120**	**250**	**ug/L**	250	23-Apr-2021 20:38
Vinyl chloride	**45**		**5.0**	**12**	**25**	**ug/L**	25	23-Apr-2021 20:17
Surr: 1,2-Dichloroethane-d4	*96.8*			**0**	*81-118*	*%REC*	*25*	*23-Apr-2021 20:17*
Surr: 1,2-Dichloroethane-d4	*96.3*			**0**	*81-118*	*%REC*	*250*	*23-Apr-2021 20:38*
Surr: 4-Bromofluorobenzene	*94.6*			**0**	*85-114*	*%REC*	*25*	*23-Apr-2021 20:17*
Surr: 4-Bromofluorobenzene	*92.0*			**0**	*85-114*	*%REC*	*250*	*23-Apr-2021 20:38*
Surr: Dibromofluoromethane	*92.6*			**0**	*80-119*	*%REC*	*25*	*23-Apr-2021 20:17*
Surr: Dibromofluoromethane	*91.2*			**0**	*80-119*	*%REC*	*250*	*23-Apr-2021 20:38*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*25*	*23-Apr-2021 20:17*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*250*	*23-Apr-2021 20:38*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	10-May-2021 17:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21041132
Sample ID: 16EW04-210419 Lab ID:HS21041132-02
Collection Date: 19-Apr-2021 08:20 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	23-Apr-2021 19:35
1,1-Dichloroethene	**11**		**2.0**	**5.0**	**10**	**ug/L**	10	23-Apr-2021 19:35
1,2-Dichloroethane	**6.2**	J	**2.0**	**5.0**	**10**	**ug/L**	10	23-Apr-2021 19:35
cis-1,2-Dichloroethene	**2,600**		**20**	**50**	**100**	**ug/L**	100	23-Apr-2021 19:56
Methylene chloride	**17**	J	**4.0**	**20**	**20**	**ug/L**	10	23-Apr-2021 19:35
Trichloroethene	**9,500**		**20**	**50**	**100**	**ug/L**	100	23-Apr-2021 19:56
Vinyl chloride	**11**		**2.0**	**5.0**	**10**	**ug/L**	10	23-Apr-2021 19:35
Surr: 1,2-Dichloroethane-d4	*99.5*			**0**	*81-118*	*%REC*	*10*	*23-Apr-2021 19:35*
Surr: 1,2-Dichloroethane-d4	*100*			**0**	*81-118*	*%REC*	*100*	*23-Apr-2021 19:56*
Surr: 4-Bromofluorobenzene	*94.1*			**0**	*85-114*	*%REC*	*10*	*23-Apr-2021 19:35*
Surr: 4-Bromofluorobenzene	*93.2*			**0**	*85-114*	*%REC*	*100*	*23-Apr-2021 19:56*
Surr: Dibromofluoromethane	*92.8*			**0**	*80-119*	*%REC*	*10*	*23-Apr-2021 19:35*
Surr: Dibromofluoromethane	*94.5*			**0**	*80-119*	*%REC*	*100*	*23-Apr-2021 19:56*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*10*	*23-Apr-2021 19:35*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*100*	*23-Apr-2021 19:56*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	10-May-2021 17:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**

Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21041132

Sample ID: 16EW08-210419 Lab ID:HS21041132-03

Collection Date: 19-Apr-2021 09:05 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	23-Apr-2021 15:01
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 15:01
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 15:01
cis-1,2-Dichloroethene	**0.84**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Apr-2021 15:01
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	23-Apr-2021 15:01
Trichloroethene	**2.6**		**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Apr-2021 15:01
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 15:01
Surr: 1,2-Dichloroethane-d4	*99.0*			**0**	*81-118*	*%REC*	*1*	*23-Apr-2021 15:01*
Surr: 4-Bromofluorobenzene	*95.6*			**0**	*85-114*	*%REC*	*1*	*23-Apr-2021 15:01*
Surr: Dibromofluoromethane	*93.4*			**0**	*80-119*	*%REC*	*1*	*23-Apr-2021 15:01*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*23-Apr-2021 15:01*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	10-May-2021 17:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21041132
Sample ID: 16WW13-210419 Lab ID:HS21041132-04
Collection Date: 19-Apr-2021 09:50 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	23-Apr-2021 15:22
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 15:22
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 15:22
cis-1,2-Dichloroethene	**140**		**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Apr-2021 15:22
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	23-Apr-2021 15:22
Trichloroethene	**22**		**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Apr-2021 15:22
Vinyl chloride	**0.87**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Apr-2021 15:22
Surr: 1,2-Dichloroethane-d4	*98.4*			**0**	*81-118*	*%REC*	*1*	*23-Apr-2021 15:22*
Surr: 4-Bromofluorobenzene	*90.4*			**0**	*85-114*	*%REC*	*1*	*23-Apr-2021 15:22*
Surr: Dibromofluoromethane	*92.4*			**0**	*80-119*	*%REC*	*1*	*23-Apr-2021 15:22*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*23-Apr-2021 15:22*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	10-May-2021 17:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21041132
Sample ID: 16WW42-210419 Lab ID:HS21041132-05
Collection Date: 19-Apr-2021 10:30 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	23-Apr-2021 15:43
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 15:43
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 15:43
cis-1,2-Dichloroethene	**66**		**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Apr-2021 15:43
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	23-Apr-2021 15:43
Trichloroethene	**0.97**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Apr-2021 15:43
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 15:43
Surr: 1,2-Dichloroethane-d4	*99.0*			**0**	*81-118*	*%REC*	*1*	*23-Apr-2021 15:43*
Surr: 4-Bromofluorobenzene	*96.3*			**0**	*85-114*	*%REC*	*1*	*23-Apr-2021 15:43*
Surr: Dibromofluoromethane	*92.9*			**0**	*80-119*	*%REC*	*1*	*23-Apr-2021 15:43*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*23-Apr-2021 15:43*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	27-Apr-2021 10:23
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	27-Apr-2021 10:23
Methane	**0.00345**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	27-Apr-2021 10:23
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**2.55**		**0.500**	**0.500**	**1.00**	**mg/L**	1	01-May-2021 00:31
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	10-May-2021 17:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**

Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21041132

Sample ID: 16RW05-210419 Lab ID:HS21041132-06

Collection Date: 19-Apr-2021 11:15 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	23-Apr-2021 17:49
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 17:49
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 17:49
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 17:49
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	23-Apr-2021 17:49
Trichloroethene	**0.52**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Apr-2021 17:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 17:49
Surr: 1,2-Dichloroethane-d4	*96.5*			**0**	*81-118*	*%REC*	*1*	*23-Apr-2021 17:49*
Surr: 4-Bromofluorobenzene	*95.4*			**0**	*85-114*	*%REC*	*1*	*23-Apr-2021 17:49*
Surr: Dibromofluoromethane	*92.0*			**0**	*80-119*	*%REC*	*1*	*23-Apr-2021 17:49*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*23-Apr-2021 17:49*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	10-May-2021 17:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21041132
Sample ID: 16RW06-210419 Lab ID:HS21041132-07
Collection Date: 19-Apr-2021 12:00 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	23-Apr-2021 18:10
1,1-Dichloroethene	**0.82**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Apr-2021 18:10
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 18:10
cis-1,2-Dichloroethene	**1.7**		**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Apr-2021 18:10
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	23-Apr-2021 18:10
Trichloroethene	**60**		**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Apr-2021 18:10
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 18:10
Surr: 1,2-Dichloroethane-d4	*97.8*			**0**	*81-118*	*%REC*	*1*	*23-Apr-2021 18:10*
Surr: 4-Bromofluorobenzene	*94.9*			**0**	*85-114*	*%REC*	*1*	*23-Apr-2021 18:10*
Surr: Dibromofluoromethane	*90.6*			**0**	*80-119*	*%REC*	*1*	*23-Apr-2021 18:10*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*23-Apr-2021 18:10*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	10-May-2021 17:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21041132
Sample ID: 16RW07-210419 Lab ID:HS21041132-08
Collection Date: 19-Apr-2021 12:40 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	23-Apr-2021 18:52
1,1-Dichloroethene	**4.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Apr-2021 18:52
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 18:52
cis-1,2-Dichloroethene	**46**		**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Apr-2021 18:52
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	23-Apr-2021 18:52
Trichloroethene	**900**		**5.0**	**12**	**25**	**ug/L**	25	23-Apr-2021 19:13
Vinyl chloride	**29**		**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Apr-2021 18:52
Surr: 1,2-Dichloroethane-d4	*99.4*			**0**	*81-118*	*%REC*	*1*	*23-Apr-2021 18:52*
Surr: 1,2-Dichloroethane-d4	*97.6*			**0**	*81-118*	*%REC*	*25*	*23-Apr-2021 19:13*
Surr: 4-Bromofluorobenzene	*93.7*			**0**	*85-114*	*%REC*	*1*	*23-Apr-2021 18:52*
Surr: 4-Bromofluorobenzene	*93.7*			**0**	*85-114*	*%REC*	*25*	*23-Apr-2021 19:13*
Surr: Dibromofluoromethane	*93.9*			**0**	*80-119*	*%REC*	*1*	*23-Apr-2021 18:52*
Surr: Dibromofluoromethane	*92.8*			**0**	*80-119*	*%REC*	*25*	*23-Apr-2021 19:13*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*1*	*23-Apr-2021 18:52*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*25*	*23-Apr-2021 19:13*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	10-May-2021 17:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21041132

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R382319 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21041132-01	16EW02-210419	19 Apr 2021 07:35			23 Apr 2021 20:38	250
HS21041132-01	16EW02-210419	19 Apr 2021 07:35			23 Apr 2021 20:17	25
HS21041132-02	16EW04-210419	19 Apr 2021 08:20			23 Apr 2021 19:56	100
HS21041132-02	16EW04-210419	19 Apr 2021 08:20			23 Apr 2021 19:35	10
HS21041132-03	16EW08-210419	19 Apr 2021 09:05			23 Apr 2021 15:01	1
HS21041132-04	16WW13-210419	19 Apr 2021 09:50			23 Apr 2021 15:22	1
HS21041132-05	16WW42-210419	19 Apr 2021 10:30			23 Apr 2021 15:43	1
HS21041132-06	16RW05-210419	19 Apr 2021 11:15			23 Apr 2021 17:49	1
HS21041132-07	16RW06-210419	19 Apr 2021 12:00			23 Apr 2021 18:10	1
HS21041132-08	16RW07-210419	19 Apr 2021 12:40			23 Apr 2021 19:13	25
HS21041132-08	16RW07-210419	19 Apr 2021 12:40			23 Apr 2021 18:52	1
Batch ID: R382623 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS21041132-05	16WW42-210419	19 Apr 2021 10:30			27 Apr 2021 10:23	1
Batch ID: R382818 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS21041132-05	16WW42-210419	19 Apr 2021 10:30			01 May 2021 00:31	1
Batch ID: R383321 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS21041132-01	16EW02-210419	19 Apr 2021 07:35			10 May 2021 17:37	1
HS21041132-02	16EW04-210419	19 Apr 2021 08:20			10 May 2021 17:37	1
HS21041132-03	16EW08-210419	19 Apr 2021 09:05			10 May 2021 17:37	1
HS21041132-04	16WW13-210419	19 Apr 2021 09:50			10 May 2021 17:37	1
HS21041132-05	16WW42-210419	19 Apr 2021 10:30			10 May 2021 17:37	1
HS21041132-06	16RW05-210419	19 Apr 2021 11:15			10 May 2021 17:37	1
HS21041132-07	16RW06-210419	19 Apr 2021 12:00			10 May 2021 17:37	1
HS21041132-08	16RW07-210419	19 Apr 2021 12:40			10 May 2021 17:37	1

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21041132

QC BATCH REPORT

Batch ID: R382623 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MBLK Sample ID: **MBLK-210427** Units: **mg/L** Analysis Date: **27-Apr-2021 09:48**
Client ID: Run ID: **FID-4_382623** SeqNo: **6067727** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000500	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000500	0.000500								U

LCS Sample ID: **LCS-210427** Units: **mg/L** Analysis Date: **27-Apr-2021 09:57**
Client ID: Run ID: **FID-4_382623** SeqNo: **6067728** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0214	0.00100	0.01804	0	119	75 - 125				
Ethene	0.0184	0.00100	0.0168	0	109	75 - 125				
Methane	0.00936	0.000500	0.009647	0	97.0	75 - 125				

LCSD Sample ID: **LCSD-210427** Units: **mg/L** Analysis Date: **27-Apr-2021 10:08**
Client ID: Run ID: **FID-4_382623** SeqNo: **6067729** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0209	0.00100	0.01804	0	116	75 - 125	0.02138	2.36	30	
Ethene	0.0178	0.00100	0.0168	0	106	75 - 125	0.01836	3.2	30	
Methane	0.00980	0.000500	0.009647	0	102	75 - 125	0.009361	4.55	30	

DUP Sample ID: **HS21041132-05DUP** Units: **mg/L** Analysis Date: **27-Apr-2021 10:35**
Client ID: **16WW42-210419** Run ID: **FID-4_382623** SeqNo: **6067731** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000500	0.00100					0	0	30	U
Ethene	0.000500	0.00100					0	0	30	U
Methane	0.00353	0.000500					0.003447	2.5	30	

The following samples were analyzed in this batch: HS21041132-05

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21041132

QC BATCH REPORT

Batch ID: R382319 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210423** Units: **ug/L** Analysis Date: **23-Apr-2021 12:54**
Client ID: Run ID: **VOA6_382319** SeqNo: **6059743** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*48.59*	*1.0*	*50*	*0*	*97.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*45.27*	*1.0*	*50*	*0*	*90.5*	*85 - 114*				
Surr: Dibromofluoromethane	*45.98*	*1.0*	*50*	*0*	*92.0*	*80 - 119*				
Surr: Toluene-d8	*53.8*	*1.0*	*50*	*0*	*108*	*89 - 112*				

LCS Sample ID: **VLCSW-210423** Units: **ug/L** Analysis Date: **23-Apr-2021 12:12**
Client ID: Run ID: **VOA6_382319** SeqNo: **6059742** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	22.45	1.0	20	0	112	80 - 119				
1,1-Dichloroethene	21.76	1.0	20	0	109	71 - 131				
1,2-Dichloroethane	21.06	1.0	20	0	105	73 - 128				
cis-1,2-Dichloroethene	22.4	1.0	20	0	112	78 - 123				
Methylene chloride	23.68	2.0	20	0	118	74 - 124				
Trichloroethene	21.93	1.0	20	0	110	79 - 123				
Vinyl chloride	23.85	1.0	20	0	119	58 - 137				
Surr: 1,2-Dichloroethane-d4	*54.43*	*1.0*	*50*	*0*	*109*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.54*	*1.0*	*50*	*0*	*107*	*85 - 114*				
Surr: Dibromofluoromethane	*53.15*	*1.0*	*50*	*0*	*106*	*80 - 119*				
Surr: Toluene-d8	*52.72*	*1.0*	*50*	*0*	*105*	*89 - 112*				

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21041132

QC BATCH REPORT

Batch ID: R382319 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS21041135-03MS** Units: **ug/L** Analysis Date: **23-Apr-2021 16:25**
Client ID: Run ID: **VOA6_382319** SeqNo: **6059753** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.84	1.0	20	0	89.2	80 - 119				
1,1-Dichloroethene	19	1.0	20	0	95.0	71 - 131				
1,2-Dichloroethane	18.35	1.0	20	0	91.8	73 - 128				
cis-1,2-Dichloroethene	17.91	1.0	20	0	89.6	78 - 123				
Methylene chloride	18.11	2.0	20	0	90.5	74 - 124				
Trichloroethene	20.15	1.0	20	0	101	79 - 123				
Vinyl chloride	21.08	1.0	20	0	105	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.37*	*1.0*	*50*	*0*	*92.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.46*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*45.85*	*1.0*	*50*	*0*	*91.7*	*80 - 119*				
Surr: Toluene-d8	*51.29*	*1.0*	*50*	*0*	*103*	*89 - 112*				

MSD Sample ID: **HS21041135-03MSD** Units: **ug/L** Analysis Date: **23-Apr-2021 16:46**
Client ID: Run ID: **VOA6_382319** SeqNo: **6059754** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.92	1.0	20	0	89.6	80 - 119	17.84	0.443	20	
1,1-Dichloroethene	17.94	1.0	20	0	89.7	71 - 131	19	5.74	20	
1,2-Dichloroethane	17.62	1.0	20	0	88.1	73 - 128	18.35	4.06	20	
cis-1,2-Dichloroethene	17.03	1.0	20	0	85.2	78 - 123	17.91	5.03	20	
Methylene chloride	18.42	2.0	20	0	92.1	74 - 124	18.11	1.71	20	
Trichloroethene	18.81	1.0	20	0	94.1	79 - 123	20.15	6.88	20	
Vinyl chloride	19.65	1.0	20	0	98.3	58 - 137	21.08	7	20	
Surr: 1,2-Dichloroethane-d4	*47.83*	*1.0*	*50*	*0*	*95.7*	*81 - 118*	*46.37*	*3.12*	*20*	
Surr: 4-Bromofluorobenzene	*49.66*	*1.0*	*50*	*0*	*99.3*	*85 - 114*	*50.46*	*1.6*	*20*	
Surr: Dibromofluoromethane	*45.54*	*1.0*	*50*	*0*	*91.1*	*80 - 119*	*45.85*	*0.68*	*20*	
Surr: Toluene-d8	*51.67*	*1.0*	*50*	*0*	*103*	*89 - 112*	*51.29*	*0.733*	*20*	

The following samples were analyzed in this batch:

HS21041132-01	HS21041132-02	HS21041132-03	HS21041132-04
HS21041132-05	HS21041132-06	HS21041132-07	HS21041132-08

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21041132

QC BATCH REPORT

Batch ID: R382818 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **MBLK2-04302021** Units: **mg/L** Analysis Date: **30-Apr-2021 21:16**
Client ID: Run ID: **TOC_04_382818** SeqNo: **6071454** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	0.500	1.00								U

LCS Sample ID: **LCS2-04302021** Units: **mg/L** Analysis Date: **30-Apr-2021 21:31**
Client ID: Run ID: **TOC_04_382818** SeqNo: **6071455** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.629	1.00	10	0	96.3	85 - 115				

LCSD Sample ID: **LCSD2-04302021** Units: **mg/L** Analysis Date: **30-Apr-2021 21:46**
Client ID: Run ID: **TOC_04_382818** SeqNo: **6071456** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.621	1.00	10	0	96.2	85 - 115	9.629	0.0831	20	

MS Sample ID: **HS21041102-08MS** Units: **mg/L** Analysis Date: **30-Apr-2021 23:07**
Client ID: Run ID: **TOC_04_382818** SeqNo: **6071461** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	15.48	1.00	10	4.841	106	80 - 120				

The following samples were analyzed in this batch: HS21041132-05

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: **HS21041132**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	21-022-0	26-Mar-2022
Dept of Defense	PJLA L20-507-R2	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2021-2022	30-Apr-2022
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2021	31-Dec-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-21-27	30-Apr-2022

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
Work Order: HS21041132

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS21041132-01	16EW02-210419	Login	4/21/2021 6:27:31 PM	NDR	Sub
HS21041132-01	16EW02-210419	Login	4/21/2021 6:27:31 PM	NDR	VOA237

ALS Houston, US Date: 10-May-21

Sample Receipt Checklist

Work Order ID: HS21041132 **Date/Time Received:** 21-Apr-2021 10:40

Client Name: CBI-Houston **Received by:** Jared R. Makan

Completed By:	/S/ Nilesh D. Ranchod	21-Apr-2021 18:34	**Reviewed by:**	/S/ RJ Modashia	22-Apr-2021 10:07
	eSignature	Date/Time		eSignature	Date/Time

Matrices: **Water** Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	2.1°C UC/C	IR31
Cooler(s)/Kit(s):	46335	
Date/Time sample(s) sent to storage:	04/21/2021 20:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Project: APTIM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 16 April 2021**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. / Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16EW02-210419	WG	4/19/21/0735		4	X					X					
16EW04-210419	WG	4/19/21/0820		4	X					X					
16EW08-210419	WG	4/19/21/0905		4	X					X					
16WW13-210419	WG	4/19/21/0950		4	X					X					
16WW42-210419	WG	4/19/21/1030		9	X	X	X			X					
16RW05-210419	WG	4/19/21/1115		4	X	[redacted] SB	[redacted] SB			X					
16RW06-210419	WG	4/19/21/1200		4	X					X					
16RW07-210419	WG	4/19/21/1240		4	X					X					

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	4/20/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
[illegible]	4/21/21	[illegible]							

Remarks:
[illegible] 0735 [illegible]
Temp = 1°C [illegible]

HS21041132

Aptim Environmental & Infrastructure, Inc.
Longhorn Army Ammunition Plant: LHAAP 16 April 202

(Word) S:\Forms\Chain of Custody - BiWeekly

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEAL

Date: 4/20/12 Time: 1430
Name: Scott Brashear
Company: Shell

Seal Broken By:

Date:

10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5856
REF: LHAAP - BO 77443 - RJ
RMA:

NO
04/21/12

FedEx Express

FedEx
TRK# 0221 9473 0841 7400

WED - 21 APR AA
PRIORITY OVERNIGHT

77090

May 10, 2021 Service Request No:E2100460

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: HS21041132

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory April 21, 2021
For your reference, these analyses have been assigned our service request number **E2100460.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100460
Project:	HS21041132	**Date Received:**	04/21/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Eight samples were received for analysis at ALS Environmental in Houston on 04/21/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100262: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch; MS/MSD was performed on an unrelated sample. The LCS and DLCS recoveries are within QC limits.

DoD certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2100460
Project: HS21041132

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100460-001	16EW02-210419	4/19/2021	0735
E2100460-002	16EW04-210419	4/19/2021	0820
E2100460-003	16EW08-210419	4/19/2021	0905
E2100460-004	16WW13-210419	4/19/2021	0950
E2100460-005	16WW42-210419	4/19/2021	1030
E2100460-006	16RW05-210419	4/19/2021	1115
E2100460-007	16RW06-210419	4/19/2021	1200
E2100460-008	16RW07-210419	4/19/2021	1240

Service Request Summary

Folder #: **E2100460**
Client Name: ALS Environmental - US
Project Name: HS21041132
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 04/21/21
Internal Due Date: 5/5/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21041132
EDD: No EDD Specified

8 125 mL-Plastic Bottle Plastic
Location: SMO
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100460-001	16EW02-210419	Ground Water	04/19/21 0735	**IV**
E2100460-002	16EW04-210419	Ground Water	04/19/21 0820	**IV**
E2100460-003	16EW08-210419	Ground Water	04/19/21 0905	**IV**
E2100460-004	16WW13-210419	Ground Water	04/19/21 0950	**IV**
E2100460-005	16WW42-210419	Ground Water	04/19/21 1030	**IV**
E2100460-006	16RW05-210419	Ground Water	04/19/21 1115	**IV**
E2100460-007	16RW06-210419	Ground Water	04/19/21 1200	**IV**
E2100460-008	16RW07-210419	Ground Water	04/19/21 1240	**IV**

Service Request Summary

Folder #: **E2100460**
Client Name: ALS Environmental - US
Project Name: HS21041132
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 04/21/21
Internal Due Date: 5/5/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21041132
EDD: No EDD Specified

8 125 mL-Plastic Bottle Plastic
Location: SMO
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	8	Level II due 5/5, IV due 5/12

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	21-022-0	3/26/2022
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2021-2022	4/30/2022
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Louisiana Department of Health and Hospitals	LA028-2021	12/31/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Minnesota Department of Health	2021671	12/31/2021
Nevada Department of Concervation and Natural Resources	TX026932021-4	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209421	4/24/2022
New Jersey Department of Environmental Protection	TX008	6/30/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2021	4/30/2022
United States Department of Agriculture	P330-19-00299	10/10/2022

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

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Houston, TX 77099
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F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15965**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS21041132
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21041132-01**	**16EW02-210419**	**Groundwater**	**19 Apr 2021 07:35**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021
2.	**HS21041132-02**	**16EW04-210419**	**Groundwater**	**19 Apr 2021 08:20**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021
3.	**HS21041132-03**	**16EW08-210419**	**Groundwater**	**19 Apr 2021 09:05**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021
4.	**HS21041132-04**	**16WW13-210419**	**Groundwater**	**19 Apr 2021 09:50**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021
5.	**HS21041132-05**	**16WW42-210419**	**Groundwater**	**19 Apr 2021 10:30**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021
6.	**HS21041132-06**	**16RW05-210419**	**Groundwater**	**19 Apr 2021 11:15**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021
7.	**HS21041132-07**	**16RW06-210419**	**Groundwater**	**19 Apr 2021 12:00**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021
8.	**HS21041132-08**	**16RW07-210419**	**Groundwater**	**19 Apr 2021 12:40**

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15965**

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: _____

Received By: _____ Date/Time: _____

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

Cooler Receipt Form

Project Chemist CA

Client/Project ALS-H

Thermometer ID 1031

Date/Time Received: 4/12/21 Initials: CA Date/Time Logged in: 4/12/21 Initials CA

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ ALS Courier ○ Client

2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ✓ No
   Were they intact? ○ Yes ○ No ✓ N/A
   Were they signed and dated? ○ Yes ○ No ✓ N/A
   If yes, how many and where?

4. Packing Material: ○ Inserts ✓ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		4/12/21	1440	CA	0.2	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No
10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 378426 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 4/30/21 12:02

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100460-001	16EW02-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2100460-002	16EW04-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2100460-003	16EW08-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2100460-004	16WW13-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100460-005	16WW42-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100460-006	16RW05-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100460-007	16RW06-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2100460-008	16RW07-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2100461-001	16SW01-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2100461-002	16SW01-210419-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2100461-003	16SW02-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2100461-004	16SW03-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2100464-001	16EW01-210421	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2100464-002	16EW03-210421	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2100464-003	16IW10-210421	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2100464-004	16RW11-210421	.01	6850/ClO4 DOD			Ground Water	10mL	
17	E2100464-005	16RW11-210421-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
18	E2100464-006	16IW20-210421	.01	6850/ClO4 DOD			Ground Water	10mL	
19	EQ2100262-01	MB		6850/ClO4 DOD			Liquid	10mL	
20	EQ2100262-02	LCS		6850/ClO4 DOD			Liquid	10mL	
21	EQ2100262-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
22	EQ2100262-04	16SW02-210419 MS	.01	6850/ClO4 DOD			Liquid	10mL	
23	EQ2100262-05	16SW02-210419 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100262-02	1.00µL	EQ2100262-03	1.00µL	EQ2100262-04	1.00µL	EQ2100262-05	1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100460-001	100.00µL	E2100460-002	100.00µL	E2100460-003	100.00µL	E2100460-004	100.00µL	E2100460-005	100.00µL	E2100460-006	100.00µL
E2100460-007	100.00µL	E2100460-008	100.00µL	E2100461-001	100.00µL	E2100461-002	100.00µL	E2100461-003	100.00µL	E2100461-004	100.00µL
E2100464-001	100.00µL	E2100464-002	100.00µL	E2100464-003	100.00µL	E2100464-004	100.00µL	E2100464-005	100.00µL	E2100464-006	100.00µL
EQ2100262-01	100.00µL	EQ2100262-02	100.00µL	EQ2100262-03	100.00µL	EQ2100262-04	100.00µL	EQ2100262-05	100.00µL		

Preparation Information Benchsheet

Prep Run#: 378426 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 4/30/21 12:02

Preparation Steps

Step: Preparation
Started: 4/30/21 12:02
Finished: 4/30/21 14:00
By: KBROWN
Comments

Comments: _____

Reviewed By: KB Date: 4/30/21

Chain of Custody

Relinquished By:		Date:		Extracts Examined
Received By:		Date:		Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100460
Project:	HS21041132	**Date Collected:**	4/19/21 0735
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16EW02-210419	**Units:**	µg/L
Lab Code:	E2100460-001	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.530**		0.100	0.0500	0.0250	1	4/30/21	4/30/21 19:55	378426	722218	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100460
Project:	HS21041132	**Date Collected:**	4/19/21 0820
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16EW04-210419	**Units:**	µg/L
Lab Code:	E2100460-002	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/30/21	4/30/21 20:05	378426	722218	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100460
Project:	HS21041132	**Date Collected:**	4/19/21 0905
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16EW08-210419	**Units:**	µg/L
Lab Code:	E2100460-003	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/30/21	4/30/21 20:14	378426	722218	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100460
Project:	HS21041132	**Date Collected:**	4/19/21 0950
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16WW13-210419	**Units:**	µg/L
Lab Code:	E2100460-004	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.292**		0.100	0.0500	0.0250	1	4/30/21	4/30/21 20:23	378426	722218	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100460
Project:	HS21041132	**Date Collected:**	4/19/21 1030
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16WW42-210419	**Units:**	µg/L
Lab Code:	E2100460-005	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/30/21	4/30/21 20:33	378426	722218	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100460
Project:	HS21041132	**Date Collected:**	4/19/21 1115
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16RW05-210419	**Units:**	µg/L
Lab Code:	E2100460-006	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.200	0.100	0.0500	2	4/30/21	5/1/21 14:29	378426	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100460
Project:	HS21041132	**Date Collected:**	4/19/21 1200
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16RW06-210419	**Units:**	µg/L
Lab Code:	E2100460-007	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	4/30/21	5/10/21 10:49	378426	722771	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100460
Project:	HS21041132	**Date Collected:**	4/19/21 1240
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16RW07-210419	**Units:**	µg/L
Lab Code:	E2100460-008	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**1.00**		0.100	0.0500	0.0250	1	4/30/21	4/30/21 21:10	378426	722218	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100460
Project:	HS21041132	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100262-01	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/30/21	4/30/21 19:08	378426	722218	

Accuracy & Precision

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10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
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ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21041132
Sample Matrix: Ground Water

Service Request: E2100460
Date Analyzed: 4/30/21

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Units: µg/L
Basis: As Received

Extraction Lot: 378426

	Lab Control Sample EQ2100262-02			Duplicate Lab Control Sample EQ2100262-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0976	0.100	98	0.0984	0.100	98	84 - 119	<1	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100460
Project:	HS21041132	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100262-02	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0976**	J	0.100	0.0500	0.0250	1	4/30/21	4/30/21 19:18	378426	722218	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100460
Project:	HS21041132	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100262-03	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0984**	J	0.100	0.0500	0.0250	1	4/30/21	4/30/21 19:27	378426	722218	

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May 05, 2021

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS21041135**

Laboratory Results for: **Longhorn Army Ammunition Plant LHAAP 16 April 2021**

Dear Vicki Graves ,

ALS Environmental received 5 sample(s) on Apr 21, 2021 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
Work Order: HS21041135

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21041135-01	16SW01-210419	Groundwater		19-Apr-2021 13:15	21-Apr-2021 10:40	☐
HS21041135-02	16SW01-210419-FD	Groundwater		19-Apr-2021 13:15	21-Apr-2021 10:40	☐
HS21041135-03	16SW02-210419	Groundwater		19-Apr-2021 13:40	21-Apr-2021 10:40	☐
HS21041135-04	16SW03-210419	Groundwater		19-Apr-2021 14:00	21-Apr-2021 10:40	☐
HS21041135-05	Trip Blank-210419	Water		19-Apr-2021 00:00	21-Apr-2021 10:40	☐

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
Work Order: HS21041135

Work Order Comments

- The analysis for Perchlorate was subcontracted our ALS Houston TX, High Resolution Lab. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R382319

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020A

Batch ID: 165436

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21041135
Sample ID: 16SW01-210419 Lab ID:HS21041135-01
Collection Date: 19-Apr-2021 13:15 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	23-Apr-2021 13:58
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 13:58
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 13:58
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 13:58
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	23-Apr-2021 13:58
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 13:58
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 13:58
Surr: 1,2-Dichloroethane-d4	*96.6*			**0**	*81-118*	*%REC*	*1*	*23-Apr-2021 13:58*
Surr: 4-Bromofluorobenzene	*89.1*			**0**	*85-114*	*%REC*	*1*	*23-Apr-2021 13:58*
Surr: Dibromofluoromethane	*92.3*			**0**	*80-119*	*%REC*	*1*	*23-Apr-2021 13:58*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*23-Apr-2021 13:58*
METALS BY ICPMS BY SW6020A		**Method:SW6020A**				Prep:SW3010A / 05-May-2021		Analyst: JHD
Arsenic	**0.000933**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	05-May-2021 14:24
Chromium	**0.00235**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	05-May-2021 14:24
Manganese	**0.107**		**0.000700**	**0.00250**	**0.00500**	**mg/L**	1	05-May-2021 14:24
Nickel	**0.00412**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-May-2021 14:24
Thallium	**0.00117**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	05-May-2021 14:24
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-May-2021 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21041135
Sample ID: 16SW01-210419-FD Lab ID:HS21041135-02
Collection Date: 19-Apr-2021 13:15 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	23-Apr-2021 14:19
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 14:19
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 14:19
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 14:19
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	23-Apr-2021 14:19
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 14:19
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 14:19
Surr: 1,2-Dichloroethane-d4	*99.6*			**0**	*81-118*	*%REC*	*1*	*23-Apr-2021 14:19*
Surr: 4-Bromofluorobenzene	*95.4*			**0**	*85-114*	*%REC*	*1*	*23-Apr-2021 14:19*
Surr: Dibromofluoromethane	*94.7*			**0**	*80-119*	*%REC*	*1*	*23-Apr-2021 14:19*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*23-Apr-2021 14:19*
METALS BY ICPMS BY SW6020A		**Method:SW6020A**				Prep:SW3010A / 05-May-2021		Analyst: JHD
Arsenic	**0.000929**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	05-May-2021 14:26
Chromium	**0.00276**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	05-May-2021 14:26
Manganese	**0.115**		**0.000700**	**0.00250**	**0.00500**	**mg/L**	1	05-May-2021 14:26
Nickel	**0.00444**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-May-2021 14:26
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-May-2021 14:26
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-May-2021 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21041135
Sample ID: 16SW02-210419 Lab ID:HS21041135-03
Collection Date: 19-Apr-2021 13:40 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	23-Apr-2021 13:36
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 13:36
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 13:36
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 13:36
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	23-Apr-2021 13:36
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 13:36
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 13:36
Surr: 1,2-Dichloroethane-d4	*96.9*			**0**	*81-118*	*%REC*	*1*	*23-Apr-2021 13:36*
Surr: 4-Bromofluorobenzene	*90.3*			**0**	*85-114*	*%REC*	*1*	*23-Apr-2021 13:36*
Surr: Dibromofluoromethane	*92.6*			**0**	*80-119*	*%REC*	*1*	*23-Apr-2021 13:36*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*23-Apr-2021 13:36*
METALS BY ICPMS BY SW6020A		**Method:SW6020A**				Prep:SW3010A / 05-May-2021		Analyst: JHD
Arsenic	**0.00101**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	05-May-2021 14:28
Chromium	**0.00336**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	05-May-2021 14:28
Manganese	**0.119**		**0.000700**	**0.00250**	**0.00500**	**mg/L**	1	05-May-2021 14:28
Nickel	**0.00452**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-May-2021 14:28
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-May-2021 14:28
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-May-2021 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21041135
Sample ID: 16SW03-210419 Lab ID:HS21041135-04
Collection Date: 19-Apr-2021 14:00 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	23-Apr-2021 14:40
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 14:40
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 14:40
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 14:40
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	23-Apr-2021 14:40
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 14:40
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 14:40
Surr: 1,2-Dichloroethane-d4	*99.6*			**0**	*81-118*	*%REC*	*1*	*23-Apr-2021 14:40*
Surr: 4-Bromofluorobenzene	*92.4*			**0**	*85-114*	*%REC*	*1*	*23-Apr-2021 14:40*
Surr: Dibromofluoromethane	*93.0*			**0**	*80-119*	*%REC*	*1*	*23-Apr-2021 14:40*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*23-Apr-2021 14:40*
METALS BY ICPMS BY SW6020A		**Method:SW6020A**				Prep:SW3010A / 05-May-2021		Analyst: JHD
Arsenic	**0.00104**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	05-May-2021 14:46
Chromium	**0.00277**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	05-May-2021 14:46
Manganese	**0.106**		**0.000700**	**0.00250**	**0.00500**	**mg/L**	1	05-May-2021 14:46
Nickel	**0.00451**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-May-2021 14:46
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-May-2021 14:46
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-May-2021 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021 WorkOrder:HS21041135
Sample ID: Trip Blank-210419 Lab ID:HS21041135-05
Collection Date: 19-Apr-2021 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	23-Apr-2021 13:15
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 13:15
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 13:15
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 13:15
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	23-Apr-2021 13:15
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 13:15
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 13:15
Surr: 1,2-Dichloroethane-d4	*97.3*			**0**	*81-118*	*%REC*	*1*	*23-Apr-2021 13:15*
Surr: 4-Bromofluorobenzene	*95.3*			**0**	*85-114*	*%REC*	*1*	*23-Apr-2021 13:15*
Surr: Dibromofluoromethane	*94.2*			**0**	*80-119*	*%REC*	*1*	*23-Apr-2021 13:15*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*23-Apr-2021 13:15*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Weight / Prep Log

Client: Aptim Environmental & Infrastucture, Inc.

Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021

WorkOrder: HS21041135

Batch ID: 165436 **Start Date:** 05 May 2021 09:00 **End Date:** 05 May 2021 13:00

Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS21041135-01		10 (mL)	10 (mL)	1	120 plastic HNO3
HS21041135-02		10 (mL)	10 (mL)	1	120 plastic HNO3
HS21041135-03		10 (mL)	10 (mL)	1	120 plastic HNO3
HS21041135-04		10 (mL)	10 (mL)	1	120 plastic HNO3

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21041135

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 165436 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS21041135-01	16SW01-210419	19 Apr 2021 13:15		05 May 2021 13:00	05 May 2021 14:24	1
HS21041135-02	16SW01-210419-FD	19 Apr 2021 13:15		05 May 2021 13:00	05 May 2021 14:26	1
HS21041135-03	16SW02-210419	19 Apr 2021 13:40		05 May 2021 13:00	05 May 2021 14:28	1
HS21041135-04	16SW03-210419	19 Apr 2021 14:00		05 May 2021 13:00	05 May 2021 14:46	1
Batch ID: R382319 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21041135-05	Trip Blank-210419	19 Apr 2021 00:00			23 Apr 2021 13:15	1
Batch ID: R382319 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21041135-01	16SW01-210419	19 Apr 2021 13:15			23 Apr 2021 13:58	1
HS21041135-02	16SW01-210419-FD	19 Apr 2021 13:15			23 Apr 2021 14:19	1
HS21041135-03	16SW02-210419	19 Apr 2021 13:40			23 Apr 2021 13:36	1
HS21041135-04	16SW03-210419	19 Apr 2021 14:00			23 Apr 2021 14:40	1
Batch ID: R383059 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS21041135-01	16SW01-210419	19 Apr 2021 13:15			05 May 2021 16:22	1
HS21041135-02	16SW01-210419-FD	19 Apr 2021 13:15			05 May 2021 16:22	1
HS21041135-03	16SW02-210419	19 Apr 2021 13:40			05 May 2021 16:22	1
HS21041135-04	16SW03-210419	19 Apr 2021 14:00			05 May 2021 16:22	1

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21041135

QC BATCH REPORT

Batch ID: 165436 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLKF1-165436** Units: **mg/L** Analysis Date: **05-May-2021 14:21**
Client ID: Run ID: **ICPMS06_383039** SeqNo: **6076989** PrepDate: **05-May-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.00100	0.00500								U
Chromium	0.00100	0.00500								U
Manganese	0.00250	0.00500								U
Nickel	0.00100	0.00500								U
Thallium	0.000500	0.00200								U

MBLK Sample ID: **MBLK-165436** Units: **mg/L** Analysis Date: **05-May-2021 14:19**
Client ID: Run ID: **ICPMS06_383039** SeqNo: **6076988** PrepDate: **05-May-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.00100	0.00500								U
Chromium	0.00100	0.00500								U
Manganese	0.00250	0.00500								U
Nickel	0.00100	0.00500								U
Thallium	0.000243	0.00200								J

LCS Sample ID: **LCS-165436** Units: **mg/L** Analysis Date: **05-May-2021 14:23**
Client ID: Run ID: **ICPMS06_383039** SeqNo: **6076990** PrepDate: **05-May-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.04554	0.00500	0.05	0	91.1	84 - 116				
Chromium	0.04749	0.00500	0.05	0	95.0	85 - 116				
Manganese	0.04602	0.00500	0.05	0	92.0	87 - 115				
Nickel	0.04877	0.00500	0.05	0	97.5	85 - 117				
Thallium	0.04368	0.00200	0.05	0	87.4	82 - 116				

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21041135

QC BATCH REPORT

Batch ID: 165436 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS21041135-03MS** Units: **mg/L** Analysis Date: **05-May-2021 14:32**
Client ID: **16SW02-210419** Run ID: **ICPMS06_383039** SeqNo: **6076995** PrepDate: **05-May-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.04849	0.00500	0.05	0.001013	95.0	84 - 116				
Chromium	0.05078	0.00500	0.05	0.003363	94.8	85 - 116				
Manganese	0.171	0.00500	0.05	0.1187	105	87 - 115				
Nickel	0.05558	0.00500	0.05	0.004516	102	85 - 117				
Thallium	0.05023	0.00200	0.05	0.000023	100	82 - 116				

MSD Sample ID: **HS21041135-03MSD** Units: **mg/L** Analysis Date: **05-May-2021 14:34**
Client ID: **16SW02-210419** Run ID: **ICPMS06_383039** SeqNo: **6076996** PrepDate: **05-May-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.04882	0.00500	0.05	0.001013	95.6	84 - 116	0.04849	0.682	20	
Chromium	0.0516	0.00500	0.05	0.003363	96.5	85 - 116	0.05078	1.61	20	
Manganese	0.1744	0.00500	0.05	0.1187	111	87 - 115	0.171	1.96	20	
Nickel	0.05498	0.00500	0.05	0.004516	101	85 - 117	0.05558	1.1	20	
Thallium	0.05141	0.00200	0.05	0.000023	103	82 - 116	0.05023	2.32	20	

PDS Sample ID: **HS21041135-03PDS** Units: **mg/L** Analysis Date: **05-May-2021 14:36**
Client ID: **16SW02-210419** Run ID: **ICPMS06_383039** SeqNo: **6076997** PrepDate: **05-May-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.1165	0.00500	0.1	0.001013	116	80 - 120				
Chromium	0.117	0.00500	0.1	0.003363	114	80 - 120				
Nickel	0.1239	0.00500	0.1	0.004516	119	80 - 120				
Thallium	0.1175	0.00200	0.1	0.000023	117	80 - 120				

SD Sample ID: **HS21041135-03SD** Units: **mg/L** Analysis Date: **05-May-2021 14:30**
Client ID: **16SW02-210419** Run ID: **ICPMS06_383039** SeqNo: **6076994** PrepDate: **05-May-2021** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	0.00500	0.0250					0.001013	0	10	U
Chromium	0.003377	0.0250					0.003363	0	10	J
Manganese	0.1211	0.0250					0.1187	2.05	10	
Nickel	0.004418	0.0250					0.004516	0	10	J
Thallium	0.00250	0.0100					0.000023	0	10	U

ALS Houston, US Date: 05-May-21

Client:	Aptim Environmental & Infrastucture, Inc.
Project:	Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder:	HS21041135

QC BATCH REPORT

Batch ID: 165436 (0)	**Instrument:**	**ICPMS06**	**Method:**	**METALS BY ICPMS BY SW6020A**	

The following samples were analyzed in this batch:	HS21041135-01	HS21041135-02	HS21041135-03	HS21041135-04

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21041135

QC BATCH REPORT

Batch ID: R382319 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210423** Units: **ug/L** Analysis Date: **23-Apr-2021 12:54**
Client ID: Run ID: **VOA6_382319** SeqNo: **6059743** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*48.59*	*1.0*	*50*	*0*	*97.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*45.27*	*1.0*	*50*	*0*	*90.5*	*85 - 114*				
Surr: Dibromofluoromethane	*45.98*	*1.0*	*50*	*0*	*92.0*	*80 - 119*				
Surr: Toluene-d8	*53.8*	*1.0*	*50*	*0*	*108*	*89 - 112*				

LCS Sample ID: **VLCSW-210423** Units: **ug/L** Analysis Date: **23-Apr-2021 12:12**
Client ID: Run ID: **VOA6_382319** SeqNo: **6059742** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	22.45	1.0	20	0	112	80 - 119				
1,1-Dichloroethene	21.76	1.0	20	0	109	71 - 131				
1,2-Dichloroethane	21.06	1.0	20	0	105	73 - 128				
cis-1,2-Dichloroethene	22.4	1.0	20	0	112	78 - 123				
Methylene chloride	23.68	2.0	20	0	118	74 - 124				
Trichloroethene	21.93	1.0	20	0	110	79 - 123				
Vinyl chloride	23.85	1.0	20	0	119	58 - 137				
Surr: 1,2-Dichloroethane-d4	*54.43*	*1.0*	*50*	*0*	*109*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.54*	*1.0*	*50*	*0*	*107*	*85 - 114*				
Surr: Dibromofluoromethane	*53.15*	*1.0*	*50*	*0*	*106*	*80 - 119*				
Surr: Toluene-d8	*52.72*	*1.0*	*50*	*0*	*105*	*89 - 112*				

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: HS21041135

QC BATCH REPORT

Batch ID: R382319 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21041135-03MS** Units: **ug/L** Analysis Date: **23-Apr-2021 16:25**
Client ID: **16SW02-210419** Run ID: **VOA6_382319** SeqNo: **6059753** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.84	1.0	20	0	89.2	80 - 119				
1,1-Dichloroethene	19	1.0	20	0	95.0	71 - 131				
1,2-Dichloroethane	18.35	1.0	20	0	91.8	73 - 128				
cis-1,2-Dichloroethene	17.91	1.0	20	0	89.6	78 - 123				
Methylene chloride	18.11	2.0	20	0	90.5	74 - 124				
Trichloroethene	20.15	1.0	20	0	101	79 - 123				
Vinyl chloride	21.08	1.0	20	0	105	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.37*	*1.0*	*50*	*0*	*92.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.46*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*45.85*	*1.0*	*50*	*0*	*91.7*	*80 - 119*				
Surr: Toluene-d8	*51.29*	*1.0*	*50*	*0*	*103*	*89 - 112*				

MSD Sample ID: **HS21041135-03MSD** Units: **ug/L** Analysis Date: **23-Apr-2021 16:46**
Client ID: **16SW02-210419** Run ID: **VOA6_382319** SeqNo: **6059754** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.92	1.0	20	0	89.6	80 - 119	17.84	0.443	20	
1,1-Dichloroethene	17.94	1.0	20	0	89.7	71 - 131	19	5.74	20	
1,2-Dichloroethane	17.62	1.0	20	0	88.1	73 - 128	18.35	4.06	20	
cis-1,2-Dichloroethene	17.03	1.0	20	0	85.2	78 - 123	17.91	5.03	20	
Methylene chloride	18.42	2.0	20	0	92.1	74 - 124	18.11	1.71	20	
Trichloroethene	18.81	1.0	20	0	94.1	79 - 123	20.15	6.88	20	
Vinyl chloride	19.65	1.0	20	0	98.3	58 - 137	21.08	7	20	
Surr: 1,2-Dichloroethane-d4	*47.83*	*1.0*	*50*	*0*	*95.7*	*81 - 118*	*46.37*	*3.12*	*20*	
Surr: 4-Bromofluorobenzene	*49.66*	*1.0*	*50*	*0*	*99.3*	*85 - 114*	*50.46*	*1.6*	*20*	
Surr: Dibromofluoromethane	*45.54*	*1.0*	*50*	*0*	*91.1*	*80 - 119*	*45.85*	*0.68*	*20*	
Surr: Toluene-d8	*51.67*	*1.0*	*50*	*0*	*103*	*89 - 112*	*51.29*	*0.733*	*20*	

The following samples were analyzed in this batch: HS21041135-01 HS21041135-02 HS21041135-03 HS21041135-04 HS21041135-05

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
WorkOrder: **HS21041135**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	21-022-0	26-Mar-2022
Dept of Defense	PJLA L20-507-R2	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2021-2022	30-Apr-2022
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2021	31-Dec-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-21-27	30-Apr-2022

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 April 2021
Work Order: HS21041135

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS21041135-01	16SW01-210419	Login	4/21/2021 6:39:41 PM	NDR	Sub
HS21041135-01	16SW01-210419	Login	4/21/2021 6:39:41 PM	NDR	VOA120

ALS Houston, US Date: 05-May-21

Sample Receipt Checklist

Work Order ID: HS21041135 **Date/Time Received:** 21-Apr-2021 10:40

Client Name: CBI-Houston **Received by:** Jared R. Makan

Completed By:	/S/ Nilesh D. Ranchod	21-Apr-2021 18:34	**Reviewed by:**	/S/ RJ Modashia	22-Apr-2021 10:08
	eSignature	Date/Time		eSignature	Date/Time

Matrices: **Water** Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	2.1°C UC/C	IR31
Cooler(s)/Kit(s):	46335	
Date/Time sample(s) sent to storage:	04/21/2021 20:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: RJ Modashia

Page 1 of 1

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 501032
Job: **LHAAP 16 April 2021**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D. / Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16SW01-210419	WG	4/19/21/1315		5	X					X	X				
16SW01-210419-FD	WG	4/19/21/1315		5	X					X	X				
16SW02-210419	WG	4/19/21/1340		5	X					X	X				
16SW02-210419-MS	WG	4/19/21/1340		5	X					X	X				
16SW02-210419-MSD	WG	4/19/21/1340		5	X					X	X				
16SW03-210419	WG	4/19/21/1400		5	X					X	X				
TRIPBLANK-210419	W	4/19/21		2	X										

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
[signature]	4/20/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
[illegible]	[illegible]	[illegible]							

Remarks: [illegible]

HS21041135

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant LHAAP 16 April 202

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEAL

Seal Broken By:

Date:

Time: 1430

10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5665
REF: LHAAP-80 77443-RJ
RMA:

FedEx Express

FedEx. 9473 0841 7400

WED - 21 APR AA
PRIORITY OVERNIGHT

May 05, 2021 Service Request No:E2100461

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: HS21041135

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory April 21, 2021
For your reference, these analyses have been assigned our service request number **E2100461.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100461
Project:	HS21041135	**Date Received:**	04/21/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Four samples were received for analysis at ALS Environmental in Houston on 04/21/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100262: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch. The LCS/DLCS recoveries are within QC limits. Both the MS and MSD recoveries were above control limits.

DoD certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2100461
Project: HS21041135

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100461-001	16SW01-210419	4/19/2021	1315
E2100461-002	16SW01-210419-FD	4/19/2021	1315
E2100461-003	16SW02-210419	4/19/2021	1340
E2100461-004	16SW03-210419	4/19/2021	1400

Service Request Summary

Folder #: **E2100461**
Client Name: ALS Environmental - US
Project Name: HS21041135
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 04/21/21
Internal Due Date: 5/5/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21041135
EDD: No EDD Specified

6 125 mL-Plastic Bottle Plastic
Location: EHRMS-AirArch 1
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100461-001	16SW01-210419	Ground Water	04/19/21 1315	**IV**
E2100461-002	16SW01-210419-FD	Ground Water	04/19/21 1315	**IV**
E2100461-003	16SW02-210419	Ground Water	04/19/21 1340	**IV**
E2100461-004	16SW03-210419	Ground Water	04/19/21 1400	**IV**

Service Request Summary

Folder #: **E2100461**
Client Name: ALS Environmental - US
Project Name: HS21041135
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 04/21/21
Internal Due Date: 5/5/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21041135
EDD: No EDD Specified

6 125 mL-Plastic Bottle Plastic
Location: EHRMS-AirArch 1
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	3	Level II due 5/5, IV due 5/12
Semivoa GCMS	ClO4 DOD/6850	1	MS/MSD

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	21-022-0	3/26/2022
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2021-2022	4/30/2022
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Louisiana Department of Health and Hospitals	LA028-2021	12/31/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Minnesota Department of Health	2021671	12/31/2021
Nevada Department of Concervation and Natural Resources	TX026932021-4	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209421	4/24/2022
New Jersey Department of Environmental Protection	TX008	6/30/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2021	4/30/2022
United States Department of Agriculture	P330-19-00299	10/10/2022

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15966**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS21041135
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21041135-01**	**16SW01-210419**	**Groundwater**	**19 Apr 2021 13:15**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021
2.	**HS21041135-02**	**16SW01-210419-FD**	**Groundwater**	**19 Apr 2021 13:15**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021
3.	**HS21041135-03**	**16SW02-210419**	**Groundwater**	**19 Apr 2021 13:40**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021
4.	**HS21041135-04**	**16SW03-210419**	**Groundwater**	**19 Apr 2021 14:00**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			05 May 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS21041135-03 MS/MSD

QC Level: DOD IV (DoD Data Package)

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15966**

Relinquished By: _____ Date/Time: _____

Received By: _____ Date/Time: 4/21/21 1990

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

Cooler Receipt Form

Project Chemist CA

Client/Project ALS-H

Thermometer ID 1031

Date/Time Received: 4/21/21 Initials: CA Date/Time Logged in: 4/21/21 Initials CA

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ ALS Courier ○ Client

2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ✓ No
   Were they intact? ○ Yes ○ No ✓ N/A
   Were they signed and dated? ○ Yes ○ No ✓ N/A
   If yes, how many and where?

4. Packing Material: ○ Inserts ✓ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		4/21/21	1440	CA	0.8	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No
10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 378426 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 4/30/21 12:02

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100460-001	16EW02-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2100460-002	16EW04-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2100460-003	16EW08-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2100460-004	16WW13-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100460-005	16WW42-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100460-006	16RW05-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100460-007	16RW06-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2100460-008	16RW07-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2100461-001	16SW01-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2100461-002	16SW01-210419-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2100461-003	16SW02-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2100461-004	16SW03-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2100464-001	16EW01-210421	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2100464-002	16EW03-210421	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2100464-003	16IW10-210421	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2100464-004	16RW11-210421	.01	6850/ClO4 DOD			Ground Water	10mL	
17	E2100464-005	16RW11-210421-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
18	E2100464-006	16IW20-210421	.01	6850/ClO4 DOD			Ground Water	10mL	
19	EQ2100262-01	MB		6850/ClO4 DOD			Liquid	10mL	
20	EQ2100262-02	LCS		6850/ClO4 DOD			Liquid	10mL	
21	EQ2100262-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
22	EQ2100262-04	16SW02-210419 MS	.01	6850/ClO4 DOD			Liquid	10mL	
23	EQ2100262-05	16SW02-210419 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100262-02	1.00µL	EQ2100262-03	1.00µL	EQ2100262-04	1.00µL	EQ2100262-05	1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100460-001	100.00µL	E2100460-002	100.00µL	E2100460-003	100.00µL	E2100460-004	100.00µL	E2100460-005	100.00µL	E2100460-006	100.00µL
E2100460-007	100.00µL	E2100460-008	100.00µL	E2100461-001	100.00µL	E2100461-002	100.00µL	E2100461-003	100.00µL	E2100461-004	100.00µL
E2100464-001	100.00µL	E2100464-002	100.00µL	E2100464-003	100.00µL	E2100464-004	100.00µL	E2100464-005	100.00µL	E2100464-006	100.00µL
EQ2100262-01	100.00µL	EQ2100262-02	100.00µL	EQ2100262-03	100.00µL	EQ2100262-04	100.00µL	EQ2100262-05	100.00µL		

Preparation Information Benchsheet

Prep Run#: 378426 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 4/30/21 12:02

Preparation Steps

Step: Preparation
Started: 4/30/21 12:02
Finished: 4/30/21 14:00
By: KBROWN
Comments

Comments: _____

Reviewed By: KB Date: 4/30/21

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined

Received By: _____ Date: _____ Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100461
Project:	HS21041135	**Date Collected:**	4/19/21 1315
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16SW01-210419	**Units:**	µg/L
Lab Code:	E2100461-001	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.500	0.250	0.125	5	4/30/21	5/1/21 14:48	378426	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100461
Project:	HS21041135	**Date Collected:**	4/19/21 1315
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16SW01-210419-FD	**Units:**	µg/L
Lab Code:	E2100461-002	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.500	0.250	0.125	5	4/30/21	5/1/21 14:57	378426	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100461
Project:	HS21041135	**Date Collected:**	4/19/21 1340
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16SW02-210419	**Units:**	µg/L
Lab Code:	E2100461-003	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.500	0.250	0.125	5	4/30/21	5/1/21 15:06	378426	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100461
Project:	HS21041135	**Date Collected:**	4/19/21 1400
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16SW03-210419	**Units:**	µg/L
Lab Code:	E2100461-004	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.500	0.250	0.125	5	4/30/21	5/1/21 15:16	378426	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100461
Project:	HS21041135	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100262-01	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/30/21	4/30/21 19:08	378426	722218	

Accuracy & Precision

ALS Environmental - Houston HRMS
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www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21041135
Sample Matrix: Ground Water

Service Request: E2100461
Date Analyzed: 4/30/21

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Units: µg/L
Basis: As Received

Extraction Lot: 378426

	Lab Control Sample EQ2100262-02			Duplicate Lab Control Sample EQ2100262-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0976	0.100	98	0.0984	0.100	98	84 - 119	<1	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100461
Project:	HS21041135	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100262-02	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0976**	J	0.100	0.0500	0.0250	1	4/30/21	4/30/21 19:18	378426	722218	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100461
Project:	HS21041135	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100262-03	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0984**	J	0.100	0.0500	0.0250	1	4/30/21	4/30/21 19:27	378426	722218	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100461
Project:	HS21041135	**Date Collected:**	4/19/21
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
		Date Analyzed:	5/ 1/21

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	16SW02-210419	**Units:**	µg/L
Lab Code:	E2100461-003	**Basis:**	As Received

Analytical Method: 6850
Prep Method: Method

		16SW02-210419MS				16SW02-210419DMS					
		Matrix Spike				**Duplicate Matrix Spike**					
		EQ2100262-04				EQ2100262-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**		**Result**	**Spike Amount**	**% Rec**		**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	ND	0.187	0.100	187	*	0.185	0.100	185	*	84 - 119	1	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100461
Project:	HS21041135	**Date Collected:**	4/19/21 1340
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16SW02-210419	**Units:**	µg/L
Lab Code:	EQ2100262-04	**Basis:**	As Received
Run Type:	Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.187**	J	0.500	0.250	0.125	5	4/30/21	5/1/21 14:10	378426	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100461
Project:	HS21041135	**Date Collected:**	4/19/21 1340
Sample Matrix:	Ground Water	**Date Received:**	4/21/21
Sample Name:	16SW02-210419	**Units:**	µg/L
Lab Code:	EQ2100262-05	**Basis:**	As Received
Run Type:	Duplicate Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.185**	J	0.500	0.250	0.125	5	4/30/21	5/1/21 14:19	378426	722220	

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May 05, 2021

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS21041169**

Laboratory Results for: **Longhorn Army Ammunition Plant 16 April 2021**

Dear Vicki Graves ,

ALS Environmental received 6 sample(s) on Apr 22, 2021 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Work Order: HS21041169

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21041169-01	16EW01-210421	Groundwater		21-Apr-2021 07:15	22-Apr-2021 10:00	☐
HS21041169-02	16EW03-210421	Groundwater		21-Apr-2021 08:00	22-Apr-2021 10:00	☐
HS21041169-03	16IW10-210421	Groundwater		21-Apr-2021 08:50	22-Apr-2021 10:00	☐
HS21041169-04	16RW11-210421	Groundwater		21-Apr-2021 09:45	22-Apr-2021 10:00	☐
HS21041169-05	16RW11-210421-FD	Groundwater		21-Apr-2021 09:45	22-Apr-2021 10:00	☐
HS21041169-06	16IW20-210421	Groundwater		21-Apr-2021 10:55	22-Apr-2021 10:00	☐

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant 16 April 2021
Work Order: HS21041169

Work Order Comments

• The analysis for Perchlorate was subcontracted our ALS Houston TX, High Resolution Lab. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R382396

Sample ID: 16IW10-210421 (HS21041169-03MS)

• The recovery of the Matrix Spike (MS) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS may be due to sample matrix interference.

Sample ID: 16IW10-210421 (HS21041169-03MSD)

• The recovery of the Matrix Spike Duplicate (MSD) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The failed recovery of the MSD may be due to sample matrix interference.

GCMS Volatiles by Method SW8260

Batch ID: R382319,R382341

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM5310B

Batch ID: R382895

Sample ID: 16IW10-210421 (HS21041169-03MS)

• The recovery of the Matrix Spike (MS) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS may be due to sample matrix interference.

Batch ID: R383002

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: R382240

Sample ID: 16EW01-210421 (HS21041169-01)

• Sample ran at 5X due to high concentration of Sulfate

Sample ID: 16IW10-210421 (HS21041169-03)

• Sample ran at 2x due to sample matrix

Sample ID: 16IW10-210421 (HS21041169-03MS)

• The MS and/or MSD recovery was outside of the control limits; however, the result in the parent sample is greater than 4x the spike amount. (Bromide)

MS/MSD failed QC limit due to suspect matrix effect. Nitrogen, Nitrate (As N)

Batch ID: R382840

Sample ID: HS21041595-02MSD

• MS and MSD are for an unrelated sample

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant 16 April 2021
Work Order: HS21041169

WetChemistry by Method SM2320B

Batch ID: R382228

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041169
Sample ID: 16EW01-210421 Lab ID:HS21041169-01
Collection Date: 21-Apr-2021 07:15 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	25	U	7.5	25	25	ug/L	25	25-Apr-2021 21:07
1,1-Dichloroethene	**22**	J	**5.0**	**12**	**25**	**ug/L**	25	25-Apr-2021 21:07
1,2-Dichloroethane	**18**	J	**5.0**	**12**	**25**	**ug/L**	25	25-Apr-2021 21:07
cis-1,2-Dichloroethene	**6,000**		**50**	**120**	**250**	**ug/L**	250	25-Apr-2021 21:28
Methylene chloride	50	U	10	50	50	ug/L	25	25-Apr-2021 21:07
Trichloroethene	**3,500**		**5.0**	**12**	**25**	**ug/L**	25	25-Apr-2021 21:07
Vinyl chloride	**720**		**5.0**	**12**	**25**	**ug/L**	25	25-Apr-2021 21:07
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*25*	*25-Apr-2021 21:07*
Surr: 1,2-Dichloroethane-d4	*99.3*			**0**	*81-118*	*%REC*	*250*	*25-Apr-2021 21:28*
Surr: 4-Bromofluorobenzene	*94.2*			**0**	*85-114*	*%REC*	*25*	*25-Apr-2021 21:07*
Surr: 4-Bromofluorobenzene	*94.1*			**0**	*85-114*	*%REC*	*250*	*25-Apr-2021 21:28*
Surr: Dibromofluoromethane	*90.7*			**0**	*80-119*	*%REC*	*250*	*25-Apr-2021 21:28*
Surr: Dibromofluoromethane	*95.6*			**0**	*80-119*	*%REC*	*25*	*25-Apr-2021 21:07*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*25*	*25-Apr-2021 21:07*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*250*	*25-Apr-2021 21:28*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	26-Apr-2021 15:28
Ethene	**0.102**		**0.00585**	**0.0125**	**0.0250**	**mg/L**	25	26-Apr-2021 16:39
Methane	**0.406**		**0.00268**	**0.0125**	**0.0125**	**mg/L**	25	26-Apr-2021 16:39
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**529**		**5.00**	**5.00**	**5.00**	**mg/L**	1	22-Apr-2021 20:27
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**16.8**		**0.500**	**0.500**	**1.00**	**mg/L**	1	03-May-2021 18:24
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**8.22**		**0.150**	**0.500**	**0.500**	**mg/L**	5	22-Apr-2021 16:04
Nitrogen, Nitrate (As N)	**0.494**	J	**0.150**	**0.500**	**0.500**	**mg/L**	5	22-Apr-2021 16:04
Sulfate	**3,420**		**10.0**	**25.0**	**25.0**	**mg/L**	50	30-Apr-2021 21:32
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-May-2021 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041169
Sample ID: 16EW03-210421 Lab ID:HS21041169-02
Collection Date: 21-Apr-2021 08:00 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	25-Apr-2021 19:43
1,1-Dichloroethene	**3.1**	J	**1.0**	**2.5**	**5.0**	**ug/L**	5	25-Apr-2021 19:43
1,2-Dichloroethane	**2.8**	J	**1.0**	**2.5**	**5.0**	**ug/L**	5	25-Apr-2021 19:43
cis-1,2-Dichloroethene	**1,200**		**10**	**25**	**50**	**ug/L**	50	25-Apr-2021 20:04
Methylene chloride	10	U	2.0	10	10	ug/L	5	25-Apr-2021 19:43
Trichloroethene	**250**		**1.0**	**2.5**	**5.0**	**ug/L**	5	25-Apr-2021 19:43
Vinyl chloride	**460**		**1.0**	**2.5**	**5.0**	**ug/L**	5	25-Apr-2021 19:43
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*5*	*25-Apr-2021 19:43*
Surr: 1,2-Dichloroethane-d4	*97.3*			**0**	*81-118*	*%REC*	*50*	*25-Apr-2021 20:04*
Surr: 4-Bromofluorobenzene	*95.5*			**0**	*85-114*	*%REC*	*5*	*25-Apr-2021 19:43*
Surr: 4-Bromofluorobenzene	*95.0*			**0**	*85-114*	*%REC*	*50*	*25-Apr-2021 20:04*
Surr: Dibromofluoromethane	*92.5*			**0**	*80-119*	*%REC*	*5*	*25-Apr-2021 19:43*
Surr: Dibromofluoromethane	*92.7*			**0**	*80-119*	*%REC*	*50*	*25-Apr-2021 20:04*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*5*	*25-Apr-2021 19:43*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*50*	*25-Apr-2021 20:04*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	26-Apr-2021 15:53
Ethene	**0.527**		**0.0117**	**0.0250**	**0.0500**	**mg/L**	50	26-Apr-2021 16:49
Methane	**0.528**		**0.00535**	**0.0250**	**0.0250**	**mg/L**	50	26-Apr-2021 16:49
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**961**		**5.00**	**5.00**	**5.00**	**mg/L**	1	22-Apr-2021 20:36
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**12.2**		**0.500**	**0.500**	**1.00**	**mg/L**	1	03-May-2021 18:41
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**5.93**		**0.150**	**0.500**	**0.500**	**mg/L**	5	22-Apr-2021 16:17
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	22-Apr-2021 16:17
Sulfate	**1,090**		**10.0**	**25.0**	**25.0**	**mg/L**	50	30-Apr-2021 21:52
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-May-2021 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041169
Sample ID: 16IW10-210421 Lab ID:HS21041169-03
Collection Date: 21-Apr-2021 08:50 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	25-Apr-2021 14:48
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 14:48
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 14:48
cis-1,2-Dichloroethene	**15**		**0.20**	**0.50**	**1.0**	**ug/L**	1	25-Apr-2021 14:48
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	25-Apr-2021 14:48
Trichloroethene	**5.4**		**0.20**	**0.50**	**1.0**	**ug/L**	1	25-Apr-2021 14:48
Vinyl chloride	**2.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	25-Apr-2021 14:48
Surr: 1,2-Dichloroethane-d4	*94.1*			**0**	*81-118*	*%REC*	*1*	*25-Apr-2021 14:48*
Surr: 4-Bromofluorobenzene	*98.5*			**0**	*85-114*	*%REC*	*1*	*25-Apr-2021 14:48*
Surr: Dibromofluoromethane	*91.3*			**0**	*80-119*	*%REC*	*1*	*25-Apr-2021 14:48*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*25-Apr-2021 14:48*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	26-Apr-2021 16:01
Ethene	**0.00683**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	26-Apr-2021 16:01
Methane	**0.733**		**0.00535**	**0.0250**	**0.0250**	**mg/L**	50	26-Apr-2021 16:59
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**1,190**		**5.00**	**5.00**	**5.00**	**mg/L**	1	22-Apr-2021 19:42
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**746**		**50.0**	**50.0**	**100**	**mg/L**	100	04-May-2021 20:46
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**88.1**		**0.600**	**2.00**	**2.00**	**mg/L**	20	30-Apr-2021 22:11
Nitrogen, Nitrate (As N)	**1.26**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	22-Apr-2021 17:21
Sulfate	1.00	U	0.400	1.00	1.00	mg/L	2	22-Apr-2021 17:21
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-May-2021 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16RW11-210421
Collection Date: 21-Apr-2021 09:45

ANALYTICAL REPORT
WorkOrder:HS21041169
Lab ID:HS21041169-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	25-Apr-2021 16:12
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 16:12
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 16:12
cis-1,2-Dichloroethene	**0.85**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	25-Apr-2021 16:12
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	25-Apr-2021 16:12
Trichloroethene	**2.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	25-Apr-2021 16:12
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 16:12
Surr: 1,2-Dichloroethane-d4	*94.9*			**0**	*81-118*	*%REC*	*1*	*25-Apr-2021 16:12*
Surr: 4-Bromofluorobenzene	*99.1*			**0**	*85-114*	*%REC*	*1*	*25-Apr-2021 16:12*
Surr: Dibromofluoromethane	*89.7*			**0**	*80-119*	*%REC*	*1*	*25-Apr-2021 16:12*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*25-Apr-2021 16:12*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-May-2021 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16RW11-210421-FD
Collection Date: 21-Apr-2021 09:45

ANALYTICAL REPORT
WorkOrder:HS21041169
Lab ID:HS21041169-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	25-Apr-2021 16:33
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 16:33
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 16:33
cis-1,2-Dichloroethene	**0.75**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	25-Apr-2021 16:33
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	25-Apr-2021 16:33
Trichloroethene	**1.9**		**0.20**	**0.50**	**1.0**	**ug/L**	1	25-Apr-2021 16:33
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 16:33
Surr: 1,2-Dichloroethane-d4	*95.3*			**0**	*81-118*	*%REC*	*1*	*25-Apr-2021 16:33*
Surr: 4-Bromofluorobenzene	*97.8*			**0**	*85-114*	*%REC*	*1*	*25-Apr-2021 16:33*
Surr: Dibromofluoromethane	*92.2*			**0**	*80-119*	*%REC*	*1*	*25-Apr-2021 16:33*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*25-Apr-2021 16:33*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-May-2021 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041169
Sample ID: 16IW20-210421 Lab ID:HS21041169-06
Collection Date: 21-Apr-2021 10:55 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	23-Apr-2021 18:31
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Apr-2021 18:31
1,2-Dichloroethane	**0.70**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Apr-2021 18:31
cis-1,2-Dichloroethene	**30**		**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Apr-2021 18:31
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	23-Apr-2021 18:31
Trichloroethene	**5.7**		**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Apr-2021 18:31
Vinyl chloride	**9.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Apr-2021 18:31
Surr: 1,2-Dichloroethane-d4	*99.6*			**0**	*81-118*	*%REC*	*1*	*23-Apr-2021 18:31*
Surr: 4-Bromofluorobenzene	*92.2*			**0**	*85-114*	*%REC*	*1*	*23-Apr-2021 18:31*
Surr: Dibromofluoromethane	*93.4*			**0**	*80-119*	*%REC*	*1*	*23-Apr-2021 18:31*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*23-Apr-2021 18:31*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	26-Apr-2021 16:29
Ethene	**0.0202**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	26-Apr-2021 16:29
Methane	**2.24**		**0.0214**	**0.100**	**0.100**	**mg/L**	200	26-Apr-2021 17:07
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**550**		**5.00**	**5.00**	**5.00**	**mg/L**	1	22-Apr-2021 19:58
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**10.6**		**0.500**	**0.500**	**1.00**	**mg/L**	1	03-May-2021 20:07
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**12.3**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	22-Apr-2021 17:09
Nitrogen, Nitrate (As N)	**0.0503**	J	**0.0300**	**0.100**	**0.100**	**mg/L**	1	22-Apr-2021 17:09
Sulfate	**95.2**		**0.200**	**0.500**	**0.500**	**mg/L**	1	22-Apr-2021 17:09
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-May-2021 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041169

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R382228 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS21041169-01	16EW01-210421	21 Apr 2021 07:15			22 Apr 2021 20:27	1
HS21041169-02	16EW03-210421	21 Apr 2021 08:00			22 Apr 2021 20:36	1
HS21041169-03	16IW10-210421	21 Apr 2021 08:50			22 Apr 2021 19:42	1
HS21041169-06	16IW20-210421	21 Apr 2021 10:55			22 Apr 2021 19:58	1
Batch ID: R382240 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21041169-01	16EW01-210421	21 Apr 2021 07:15			22 Apr 2021 16:04	5
HS21041169-02	16EW03-210421	21 Apr 2021 08:00			22 Apr 2021 16:17	5
HS21041169-03	16IW10-210421	21 Apr 2021 08:50			22 Apr 2021 17:21	2
HS21041169-06	16IW20-210421	21 Apr 2021 10:55			22 Apr 2021 17:09	1
Batch ID: R382319 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21041169-06	16IW20-210421	21 Apr 2021 10:55			23 Apr 2021 18:31	1
Batch ID: R382341 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21041169-01	16EW01-210421	21 Apr 2021 07:15			25 Apr 2021 21:28	250
HS21041169-01	16EW01-210421	21 Apr 2021 07:15			25 Apr 2021 21:07	25
HS21041169-02	16EW03-210421	21 Apr 2021 08:00			25 Apr 2021 20:04	50
HS21041169-02	16EW03-210421	21 Apr 2021 08:00			25 Apr 2021 19:43	5
HS21041169-03	16IW10-210421	21 Apr 2021 08:50			25 Apr 2021 14:48	1
HS21041169-04	16RW11-210421	21 Apr 2021 09:45			25 Apr 2021 16:12	1
HS21041169-05	16RW11-210421-FD	21 Apr 2021 09:45			25 Apr 2021 16:33	1
Batch ID: R382396 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS21041169-01	16EW01-210421	21 Apr 2021 07:15			26 Apr 2021 16:39	25
HS21041169-01	16EW01-210421	21 Apr 2021 07:15			26 Apr 2021 15:28	1
HS21041169-02	16EW03-210421	21 Apr 2021 08:00			26 Apr 2021 16:49	50
HS21041169-02	16EW03-210421	21 Apr 2021 08:00			26 Apr 2021 15:53	1
HS21041169-03	16IW10-210421	21 Apr 2021 08:50			26 Apr 2021 16:59	50
HS21041169-03	16IW10-210421	21 Apr 2021 08:50			26 Apr 2021 16:01	1
HS21041169-06	16IW20-210421	21 Apr 2021 10:55			26 Apr 2021 17:07	200
HS21041169-06	16IW20-210421	21 Apr 2021 10:55			26 Apr 2021 16:29	1
Batch ID: R382840 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21041169-01	16EW01-210421	21 Apr 2021 07:15			30 Apr 2021 21:32	50
HS21041169-02	16EW03-210421	21 Apr 2021 08:00			30 Apr 2021 21:52	50
HS21041169-03	16IW10-210421	21 Apr 2021 08:50			30 Apr 2021 22:11	20
Batch ID: R382895 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS21041169-01	16EW01-210421	21 Apr 2021 07:15			03 May 2021 18:24	1
HS21041169-02	16EW03-210421	21 Apr 2021 08:00			03 May 2021 18:41	1
HS21041169-06	16IW20-210421	21 Apr 2021 10:55			03 May 2021 20:07	1

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041169

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R383002 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS21041169-03	16IW10-210421	21 Apr 2021 08:50			04 May 2021 20:46	100
Batch ID: R383059 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS21041169-01	16EW01-210421	21 Apr 2021 07:15			05 May 2021 16:22	1
HS21041169-02	16EW03-210421	21 Apr 2021 08:00			05 May 2021 16:22	1
HS21041169-03	16IW10-210421	21 Apr 2021 08:50			05 May 2021 16:22	1
HS21041169-04	16RW11-210421	21 Apr 2021 09:45			05 May 2021 16:22	1
HS21041169-05	16RW11-210421-FD	21 Apr 2021 09:45			05 May 2021 16:22	1
HS21041169-06	16IW20-210421	21 Apr 2021 10:55			05 May 2021 16:22	1

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041169

QC BATCH REPORT

Batch ID: R382396 (0) **Instrument: FID-4** **Method: DISSOLVED GASES BY RSK-175**

MBLK Sample ID: **MBLK-210426** Units: **mg/L** Analysis Date: **26-Apr-2021 12:07**
Client ID: Run ID: **FID-4_382396** SeqNo: **6061648** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000500	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000500	0.000500								U

LCS Sample ID: **LCS-210426** Units: **mg/L** Analysis Date: **26-Apr-2021 12:26**
Client ID: Run ID: **FID-4_382396** SeqNo: **6061649** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0176	0.00100	0.01804	0	97.5	75 - 125				
Ethene	0.0138	0.00100	0.0168	0	82.2	75 - 125				
Methane	0.00837	0.000500	0.009647	0	86.8	75 - 125				

MS Sample ID: **HS21041169-03MS** Units: **mg/L** Analysis Date: **26-Apr-2021 16:10**
Client ID: **16IW10-210421** Run ID: **FID-4_382396** SeqNo: **6061667** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.00942	0.00100	0.01804	0	52.2	75 - 125				S
Ethene	0.0146	0.00100	0.0168	0.006834	46.1	75 - 125				S
Methane	0.649	0.000500	0.009647	0.7203	-740	75 - 125				SEO

MSD Sample ID: **HS21041169-03MSD** Units: **mg/L** Analysis Date: **26-Apr-2021 16:19**
Client ID: **16IW10-210421** Run ID: **FID-4_382396** SeqNo: **6061668** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0103	0.00100	0.01804	0	57.3	75 - 125	0.009419	9.33	30	S
Ethene	0.0151	0.00100	0.0168	0.006834	49.4	75 - 125	0.01458	3.77	30	S
Methane	0.691	0.000500	0.009647	0.7203	-300	75 - 125	0.6490	6.32	30	SEO

The following samples were analyzed in this batch: HS21041169-01 HS21041169-02 HS21041169-03 HS21041169-06

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041169

QC BATCH REPORT

Batch ID: R382319 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210423** Units: **ug/L** Analysis Date: **23-Apr-2021 12:54**
Client ID: Run ID: **VOA6_382319** SeqNo: **6059743** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*48.59*	*1.0*	*50*	*0*	*97.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*45.27*	*1.0*	*50*	*0*	*90.5*	*85 - 114*				
Surr: Dibromofluoromethane	*45.98*	*1.0*	*50*	*0*	*92.0*	*80 - 119*				
Surr: Toluene-d8	*53.8*	*1.0*	*50*	*0*	*108*	*89 - 112*				

LCS Sample ID: **VLCSW-210423** Units: **ug/L** Analysis Date: **23-Apr-2021 12:12**
Client ID: Run ID: **VOA6_382319** SeqNo: **6059742** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	22.45	1.0	20	0	112	80 - 119				
1,1-Dichloroethene	21.76	1.0	20	0	109	71 - 131				
1,2-Dichloroethane	21.06	1.0	20	0	105	73 - 128				
cis-1,2-Dichloroethene	22.4	1.0	20	0	112	78 - 123				
Methylene chloride	23.68	2.0	20	0	118	74 - 124				
Trichloroethene	21.93	1.0	20	0	110	79 - 123				
Vinyl chloride	23.85	1.0	20	0	119	58 - 137				
Surr: 1,2-Dichloroethane-d4	*54.43*	*1.0*	*50*	*0*	*109*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.54*	*1.0*	*50*	*0*	*107*	*85 - 114*				
Surr: Dibromofluoromethane	*53.15*	*1.0*	*50*	*0*	*106*	*80 - 119*				
Surr: Toluene-d8	*52.72*	*1.0*	*50*	*0*	*105*	*89 - 112*				

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041169

QC BATCH REPORT

Batch ID: R382319 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS21041135-03MS** Units: **ug/L** Analysis Date: **23-Apr-2021 16:25**
Client ID: Run ID: **VOA6_382319** SeqNo: **6059753** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.84	1.0	20	0	89.2	80 - 119				
1,1-Dichloroethene	19	1.0	20	0	95.0	71 - 131				
1,2-Dichloroethane	18.35	1.0	20	0	91.8	73 - 128				
cis-1,2-Dichloroethene	17.91	1.0	20	0	89.6	78 - 123				
Methylene chloride	18.11	2.0	20	0	90.5	74 - 124				
Trichloroethene	20.15	1.0	20	0	101	79 - 123				
Vinyl chloride	21.08	1.0	20	0	105	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.37*	*1.0*	*50*	*0*	*92.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.46*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*45.85*	*1.0*	*50*	*0*	*91.7*	*80 - 119*				
Surr: Toluene-d8	*51.29*	*1.0*	*50*	*0*	*103*	*89 - 112*				

MSD Sample ID: **HS21041135-03MSD** Units: **ug/L** Analysis Date: **23-Apr-2021 16:46**
Client ID: Run ID: **VOA6_382319** SeqNo: **6059754** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.92	1.0	20	0	89.6	80 - 119	17.84	0.443	20	
1,1-Dichloroethene	17.94	1.0	20	0	89.7	71 - 131	19	5.74	20	
1,2-Dichloroethane	17.62	1.0	20	0	88.1	73 - 128	18.35	4.06	20	
cis-1,2-Dichloroethene	17.03	1.0	20	0	85.2	78 - 123	17.91	5.03	20	
Methylene chloride	18.42	2.0	20	0	92.1	74 - 124	18.11	1.71	20	
Trichloroethene	18.81	1.0	20	0	94.1	79 - 123	20.15	6.88	20	
Vinyl chloride	19.65	1.0	20	0	98.3	58 - 137	21.08	7	20	
Surr: 1,2-Dichloroethane-d4	*47.83*	*1.0*	*50*	*0*	*95.7*	*81 - 118*	*46.37*	*3.12*	*20*	
Surr: 4-Bromofluorobenzene	*49.66*	*1.0*	*50*	*0*	*99.3*	*85 - 114*	*50.46*	*1.6*	*20*	
Surr: Dibromofluoromethane	*45.54*	*1.0*	*50*	*0*	*91.1*	*80 - 119*	*45.85*	*0.68*	*20*	
Surr: Toluene-d8	*51.67*	*1.0*	*50*	*0*	*103*	*89 - 112*	*51.29*	*0.733*	*20*	

The following samples were analyzed in this batch: HS21041169-06

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041169

QC BATCH REPORT

Batch ID: R382341 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210425** Units: **ug/L** Analysis Date: **25-Apr-2021 13:45**
Client ID: Run ID: **VOA6_382341** SeqNo: **6060288** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*47.35*	*1.0*	*50*	*0*	*94.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*46.34*	*1.0*	*50*	*0*	*92.7*	*85 - 114*				
Surr: Dibromofluoromethane	*45.8*	*1.0*	*50*	*0*	*91.6*	*80 - 119*				
Surr: Toluene-d8	*53.63*	*1.0*	*50*	*0*	*107*	*89 - 112*				

LCS Sample ID: **VLCSW-210425** Units: **ug/L** Analysis Date: **25-Apr-2021 13:03**
Client ID: Run ID: **VOA6_382341** SeqNo: **6060287** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	21.98	1.0	20	0	110	80 - 119				
1,1-Dichloroethene	17.51	1.0	20	0	87.5	71 - 131				
1,2-Dichloroethane	20.39	1.0	20	0	102	73 - 128				
cis-1,2-Dichloroethene	21.09	1.0	20	0	105	78 - 123				
Methylene chloride	21.19	2.0	20	0	106	74 - 124				
Trichloroethene	19.92	1.0	20	0	99.6	79 - 123				
Vinyl chloride	18.77	1.0	20	0	93.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.91*	*1.0*	*50*	*0*	*108*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.34*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*50.43*	*1.0*	*50*	*0*	*101*	*80 - 119*				
Surr: Toluene-d8	*51.26*	*1.0*	*50*	*0*	*103*	*89 - 112*				

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041169

QC BATCH REPORT

Batch ID: R382341 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS21041169-03MS** Units: **ug/L** Analysis Date: **25-Apr-2021 15:09**
Client ID: **16IW10-210421** Run ID: **VOA6_382341** SeqNo: **6060292** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.9	1.0	20	0	99.5	80 - 119				
1,1-Dichloroethene	17.96	1.0	20	0	89.8	71 - 131				
1,2-Dichloroethane	18.76	1.0	20	0	93.8	73 - 128				
cis-1,2-Dichloroethene	32.24	1.0	20	15.28	84.8	78 - 123				
Methylene chloride	18.33	2.0	20	0	91.7	74 - 124				
Trichloroethene	24.38	1.0	20	5.447	94.7	79 - 123				
Vinyl chloride	22.63	1.0	20	2.451	101	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.44*	*1.0*	*50*	*0*	*96.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.76*	*1.0*	*50*	*0*	*97.5*	*85 - 114*				
Surr: Dibromofluoromethane	*47.82*	*1.0*	*50*	*0*	*95.6*	*80 - 119*				
Surr: Toluene-d8	*52.13*	*1.0*	*50*	*0*	*104*	*89 - 112*				

MSD Sample ID: **HS21041169-03MSD** Units: **ug/L** Analysis Date: **25-Apr-2021 15:30**
Client ID: **16IW10-210421** Run ID: **VOA6_382341** SeqNo: **6060293** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.3	1.0	20	0	101	80 - 119	19.9	1.98	20	
1,1-Dichloroethene	17.12	1.0	20	0	85.6	71 - 131	17.96	4.74	20	
1,2-Dichloroethane	18.86	1.0	20	0	94.3	73 - 128	18.76	0.516	20	
cis-1,2-Dichloroethene	32.68	1.0	20	15.28	87.0	78 - 123	32.24	1.34	20	
Methylene chloride	18.48	2.0	20	0	92.4	74 - 124	18.33	0.778	20	
Trichloroethene	23.57	1.0	20	5.447	90.6	79 - 123	24.38	3.38	20	
Vinyl chloride	21.86	1.0	20	2.451	97.0	58 - 137	22.63	3.47	20	
Surr: 1,2-Dichloroethane-d4	*48.73*	*1.0*	*50*	*0*	*97.5*	*81 - 118*	*48.44*	*0.614*	*20*	
Surr: 4-Bromofluorobenzene	*47.89*	*1.0*	*50*	*0*	*95.8*	*85 - 114*	*48.76*	*1.82*	*20*	
Surr: Dibromofluoromethane	*46.89*	*1.0*	*50*	*0*	*93.8*	*80 - 119*	*47.82*	*1.95*	*20*	
Surr: Toluene-d8	*52.33*	*1.0*	*50*	*0*	*105*	*89 - 112*	*52.13*	*0.386*	*20*	

The following samples were analyzed in this batch: HS21041169-01 HS21041169-02 HS21041169-03 HS21041169-04 HS21041169-05

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041169

QC BATCH REPORT

Batch ID: R382228 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM2320B**

MBLK Sample ID: **WBLKW1-210422** Units: **mg/L** Analysis Date: **22-Apr-2021 18:55**
Client ID: Run ID: **ManTech01_382228** SeqNo: **6057475** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **LCS1-210422** Units: **mg/L** Analysis Date: **22-Apr-2021 19:03**
Client ID: Run ID: **ManTech01_382228** SeqNo: **6057476** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1025	5.00	1000	0	102	85 - 115				

LCSD Sample ID: **LCSD1-210422** Units: **mg/L** Analysis Date: **22-Apr-2021 19:12**
Client ID: Run ID: **ManTech01_382228** SeqNo: **6057477** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1025	5.00	1000	0	102	85 - 115	1025	0.0176	20	

DUP Sample ID: **HS21041169-03DUP** Units: **mg/L** Analysis Date: **22-Apr-2021 19:52**
Client ID: **16IW10-210421** Run ID: **ManTech01_382228** SeqNo: **6057482** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1199	5.00					1186	1.06	20	

DUP Sample ID: **HS21041166-02DUP** Units: **mg/L** Analysis Date: **22-Apr-2021 19:25**
Client ID: Run ID: **ManTech01_382228** SeqNo: **6057479** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	137	5.00					137.7	0.539	20	

The following samples were analyzed in this batch: HS21041169-01 HS21041169-02 HS21041169-03 HS21041169-06

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041169

QC BATCH REPORT

Batch ID: R382240 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **22-Apr-2021 18:41**
Client ID: Run ID: **ICS2100_382240** SeqNo: **6057888** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **22-Apr-2021 18:54**
Client ID: Run ID: **ICS2100_382240** SeqNo: **6057889** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.827	0.100	4	0	95.7	80 - 120				
Nitrogen, Nitrate (As N)	3.945	0.100	4	0	98.6	80 - 120				
Sulfate	19.24	0.500	20	0	96.2	80 - 120				

MS Sample ID: **HS21041169-03MS** Units: **mg/L** Analysis Date: **22-Apr-2021 17:36**
Client ID: **16IW10-210421** Run ID: **ICS2100_382240** SeqNo: **6057884** PrepDate: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	91.93	0.200	4	89.57	59.0	80 - 120				SEO
Nitrogen, Nitrate (As N)	3.849	0.200	4	1.264	64.6	80 - 120				S
Sulfate	21.11	1.00	20	0	106	80 - 120				

MSD Sample ID: **HS21041169-03MSD** Units: **mg/L** Analysis Date: **22-Apr-2021 17:49**
Client ID: **16IW10-210421** Run ID: **ICS2100_382240** SeqNo: **6057885** PrepDate: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	91.26	0.200	4	89.57	42.3	80 - 120	91.93	0.732	20	SEO
Nitrogen, Nitrate (As N)	3.846	0.200	4	1.264	64.6	80 - 120	3.849	0.078	20	S
Sulfate	20.99	1.00	20	0	105	80 - 120	21.11	0.563	20	

The following samples were analyzed in this batch: HS21041169-01 HS21041169-02 HS21041169-03 HS21041169-06

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041169

QC BATCH REPORT

Batch ID: R382840 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **01-May-2021 08:23**
Client ID: Run ID: **ICS-Integrion_382840** SeqNo: **6071997** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **01-May-2021 08:41**
Client ID: Run ID: **ICS-Integrion_382840** SeqNo: **6071998** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.528	0.100	4	0	88.2	80 - 120				
Sulfate	19.12	0.500	20	0	95.6	80 - 120				

MS Sample ID: **HS21041595-02MS** Units: **mg/L** Analysis Date: **30-Apr-2021 13:47**
Client ID: Run ID: **ICS-Integrion_382840** SeqNo: **6072007** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.772	0.100	2	0.8359	96.8	80 - 120				
Sulfate	294.5	0.500	10	285	95.1	80 - 120				EO

MSD Sample ID: **HS21041595-02MSD** Units: **mg/L** Analysis Date: **30-Apr-2021 14:06**
Client ID: Run ID: **ICS-Integrion_382840** SeqNo: **6072033** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.929	0.100	2	0.8359	105	80 - 120	2.772	5.52	20	
Sulfate	298.2	0.500	10	285	132	80 - 120	294.5	1.25	20	SEO

The following samples were analyzed in this batch: HS21041169-01 HS21041169-02 HS21041169-03

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041169

QC BATCH REPORT

Batch ID: R382895 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **MBLK-05032021** Units: **mg/L** Analysis Date: **03-May-2021 16:25**
Client ID: Run ID: **TOC_04_382895** SeqNo: **6073620** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	0.500	1.00								U

LCS Sample ID: **LCS-05032021** Units: **mg/L** Analysis Date: **03-May-2021 16:41**
Client ID: Run ID: **TOC_04_382895** SeqNo: **6073621** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.38	1.00	10	0	104	85 - 115				

LCSD Sample ID: **LCSD-05032021** Units: **mg/L** Analysis Date: **03-May-2021 16:57**
Client ID: Run ID: **TOC_04_382895** SeqNo: **6073622** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.36	1.00	10	0	104	85 - 115	10.38	0.193	20	

MS Sample ID: **HS21041169-03MS** Units: **mg/L** Analysis Date: **03-May-2021 19:50**
Client ID: **16IW10-210421** Run ID: **TOC_04_382895** SeqNo: **6073633** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	780.7	1.00	10	784.1	-34.0	80 - 120				SEO

The following samples were analyzed in this batch: HS21041169-01 HS21041169-02 HS21041169-06

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041169

QC BATCH REPORT

Batch ID: R383002 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **MBLK-05042021** Units: **mg/L** Analysis Date: **04-May-2021 17:35**
Client ID: Run ID: **TOC_04_383002** SeqNo: **6075960** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	0.500	1.00								U

LCS Sample ID: **LCS-05042021** Units: **mg/L** Analysis Date: **04-May-2021 17:51**
Client ID: Run ID: **TOC_04_383002** SeqNo: **6075961** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.83	1.00	10	0	98.3	85 - 115				

LCSD Sample ID: **LCSD-05042021** Units: **mg/L** Analysis Date: **04-May-2021 18:06**
Client ID: Run ID: **TOC_04_383002** SeqNo: **6075962** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.588	1.00	10	0	95.9	85 - 115	9.83	2.49	20	

MS Sample ID: **HS21041169-03MS** Units: **mg/L** Analysis Date: **04-May-2021 21:03**
Client ID: **16IW10-210421** Run ID: **TOC_04_383002** SeqNo: **6075974** PrepDate: DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1800	100	1000	746.1	105	80 - 120				

The following samples were analyzed in this batch: HS21041169-03

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: **HS21041169**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	21-022-0	26-Mar-2022
Dept of Defense	PJLA L20-507-R2	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2021-2022	30-Apr-2022
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2021	31-Dec-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-21-27	30-Apr-2022

ALS Houston, US Date: 05-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Work Order: HS21041169

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS21041169-01	16EW01-210421	Login	4/22/2021 12:42:49 PM	JRM	WET376
HS21041169-01	16EW01-210421	Login	4/22/2021 12:42:49 PM	JRM	Sub
HS21041169-01	16EW01-210421	Login	4/22/2021 12:42:49 PM	JRM	VOA041
HS21041169-01	16EW01-210421	Login	4/22/2021 12:42:49 PM	JRM	RSK004
HS21041169-01	16EW01-210421	Login	4/22/2021 12:42:49 PM	JRM	WET376
HS21041169-02	16EW03-210421	Login	4/22/2021 12:42:49 PM	JRM	WET376
HS21041169-02	16EW03-210421	Login	4/22/2021 12:42:49 PM	JRM	Sub
HS21041169-02	16EW03-210421	Login	4/22/2021 12:42:49 PM	JRM	VOA041
HS21041169-02	16EW03-210421	Login	4/22/2021 12:42:49 PM	JRM	RSK004
HS21041169-02	16EW03-210421	Login	4/22/2021 12:42:49 PM	JRM	WET376
HS21041169-03	16IW10-210421	Login	4/22/2021 12:42:49 PM	JRM	WET376
HS21041169-03	16IW10-210421	Login	4/22/2021 12:42:49 PM	JRM	Sub
HS21041169-03	16IW10-210421	Login	4/22/2021 12:42:49 PM	JRM	VOA041
HS21041169-03	16IW10-210421	Login	4/22/2021 12:42:49 PM	JRM	RSK004
HS21041169-03	16IW10-210421	Login	4/22/2021 12:42:49 PM	JRM	WET376
HS21041169-04	16RW11-210421	Login	4/22/2021 12:42:49 PM	JRM	Sub
HS21041169-04	16RW11-210421	Login	4/22/2021 12:42:49 PM	JRM	VOA041
HS21041169-06	16IW20-210421	Login	4/22/2021 12:42:49 PM	JRM	WET376
HS21041169-06	16IW20-210421	Login	4/22/2021 12:42:49 PM	JRM	Sub
HS21041169-06	16IW20-210421	Login	4/22/2021 12:42:49 PM	JRM	VOA041
HS21041169-06	16IW20-210421	Login	4/22/2021 12:42:49 PM	JRM	RSK004
HS21041169-06	16IW20-210421	Login	4/22/2021 12:42:49 PM	JRM	WET376

ALS Houston, US Date: 05-May-21

Sample Receipt Checklist

Work Order ID: HS21041169 **Date/Time Received:** **22-Apr-2021 10:00**

Client Name: CBI-Houston **Received by:** **Jared R. Makan**

Completed By:	/S/ Paresh M. Giga	21-Apr-2021 15:23	**Reviewed by:**	/S/ RJ Modashia	22-Apr-2021 17:06
	eSignature	Date/Time		eSignature	Date/Time

Matrices: **Water** Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	0.4°C UC/C	IR31
Cooler(s)/Kit(s):	46602	
Date/Time sample(s) sent to storage:	4/22/2021 12:45	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: RJ Modashia

Project: APTIM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 16 April 2021**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. / Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16EW01-210421	WG	4/21/21/0715		10	X	X	X	X	X	X						
16EW03-210421	WG	4/21/21/0800		10	X	X	X	X	X	X						
16IW10-210421	WG	4/21/21/0850		10	X	X	X	X	X	X						
16IW10-210421-MS	WG	4/21/21/0850		10	X	X	X	X	X	X						
16IW10-210421-MSD	WG	4/21/21/0850		10	X	X	X	X	X	X						
16RW11-210421	WG	4/21/21/0945		4	X					X						
16RW11-210421-FD	WG	4/21/21/0945		4	X					X						
16IW20-210421	WG	4/21/21/1055		10	X	X	X	X	X	X						

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	4/21/21	1330	Patti Ma	4/22/21	10:10						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

HS21041169

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant 16 April 2021

45534 0.4C IR31 CF0

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

45539

CUSTODY SEAL

Date: 4/21/21 Time: 1320
Name: Scott Beesinger
Company: BHMS

Seal Broken By: SM
Date: 04/22/21

45539

APR 2 2 2021

4

Must Deliver Next Business Day
Time and Tempature Sensitive!

45539

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 29MAR21
ACTWGT: 1.00 LB MAN
CAD: 0221247/CAFE3409
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP--BO 77443--RJ

RMA:

FedEx Express

FedEx
TRK# 0221 9473 0841 7502

THU - 22 APR AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

EID: 5090257 21Apr2071 CGGA 560C3/F9A6/1B23

May 05, 2021 Service Request No:E2100464

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: HS21041169

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory April 22, 2021
For your reference, these analyses have been assigned our service request number **E2100464.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental



Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100464
Project:	HS21041169	**Date Received:**	04/22/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Six samples were received for analysis at ALS Environmental in Houston on 04/22/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100262: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch. The MS/MSD was performed on an unrelated sample. The LCS/DLCS recoveries are within QC limits.

DoD certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2100464
Project: HS21041169

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100464-001	16EW01-210421	4/21/2021	0715
E2100464-002	16EW03-210421	4/21/2021	0800
E2100464-003	16IW10-210421	4/21/2021	0850
E2100464-004	16RW11-210421	4/21/2021	0945
E2100464-005	16RW11-210421-FD	4/21/2021	0945
E2100464-006	16IW20-210421	4/21/2021	1055

Service Request Summary

Folder #: **E2100464**
Client Name: ALS Environmental - US
Project Name: HS21041169
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 04/22/21
Internal Due Date: 5/6/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21041169
EDD: No EDD Specified

6 125 mL-Plastic Bottle Plastic
Location: EHRMS-AirArch 1
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100464-001	16EW01-210421	Ground Water	04/21/21 0715	**IV**
E2100464-002	16EW03-210421	Ground Water	04/21/21 0800	**IV**
E2100464-003	16IW10-210421	Ground Water	04/21/21 0850	**IV**
E2100464-004	16RW11-210421	Ground Water	04/21/21 0945	**IV**
E2100464-005	16RW11-210421-FD	Ground Water	04/21/21 0945	**IV**
E2100464-006	16IW20-210421	Ground Water	04/21/21 1055	**IV**

Service Request Summary

Folder #: **E2100464**
Client Name: ALS Environmental - US
Project Name: HS21041169
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 04/22/21
Internal Due Date: 5/6/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21041169
EDD: No EDD Specified

6 125 mL-Plastic Bottle Plastic
Location: EHRMS-AirArch 1
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	5	Level II due 5/6,IV due 5/13
Semivoa GCMS	ClO4 DOD/6850	1	MS/MSD

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	21-022-0	3/26/2022
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2021-2022	4/30/2022
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Louisiana Department of Health and Hospitals	LA028-2021	12/31/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Minnesota Department of Health	2021671	12/31/2021
Nevada Department of Concervation and Natural Resources	TX026932021-4	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209421	4/24/2022
New Jersey Department of Environmental Protection	TX008	6/30/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2021	4/30/2022
United States Department of Agriculture	P330-19-00299	10/10/2022



Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

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Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15972**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS21041169
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21041169-01**	**16EW01-210421**	**Groundwater**	**21 Apr 2021 07:15**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			06 May 2021
2.	**HS21041169-02**	**16EW03-210421**	**Groundwater**	**21 Apr 2021 08:00**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			06 May 2021
3.	**HS21041169-03**	**16IW10-210421**	**Groundwater**	**21 Apr 2021 08:50**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			06 May 2021
4.	**HS21041169-04**	**16RW11-210421**	**Groundwater**	**21 Apr 2021 09:45**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			06 May 2021
5.	**HS21041169-05**	**16RW11-210421-FD**	**Groundwater**	**21 Apr 2021 09:45**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			06 May 2021
6.	**HS21041169-06**	**16IW20-210421**	**Groundwater**	**21 Apr 2021 10:55**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			06 May 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

WORLDWIDE ACCESS TO MARKET PARTNERS

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense**

COC ID: **15972**

Relinquished By: J. Johnson

Date/Time:

Received By:

Date/Time: 4/22/21 1498

Cooler ID(s):

Temperature(s):

ALS Environmental

Cooler Receipt Form

Project Chemist CA

Client/Project ALS-H1 Thermometer ID IR31

Date/Time Received: 4/22/21 Initials: CA Date/Time Logged in: 4/22/21 Initials CA

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ ALS Courier ○ Client

2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ✓ No If yes, how many and where?

Were they intact? ○ Yes ○ No ✓ N/A

Were they signed and dated? ○ Yes ○ No ✓ N/A

4. Packing Material: ○ Inserts ✓ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ✓ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		4/22/21	1448	CA	4.5	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No

7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No

8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No

9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No

10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 378426 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 4/30/21 12:02

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100460-001	16EW02-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2100460-002	16EW04-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2100460-003	16EW08-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2100460-004	16WW13-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100460-005	16WW42-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100460-006	16RW05-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100460-007	16RW06-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2100460-008	16RW07-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2100461-001	16SW01-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2100461-002	16SW01-210419-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2100461-003	16SW02-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2100461-004	16SW03-210419	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2100464-001	16EW01-210421	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2100464-002	16EW03-210421	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2100464-003	16IW10-210421	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2100464-004	16RW11-210421	.01	6850/ClO4 DOD			Ground Water	10mL	
17	E2100464-005	16RW11-210421-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
18	E2100464-006	16IW20-210421	.01	6850/ClO4 DOD			Ground Water	10mL	
19	EQ2100262-01	MB		6850/ClO4 DOD			Liquid	10mL	
20	EQ2100262-02	LCS		6850/ClO4 DOD			Liquid	10mL	
21	EQ2100262-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
22	EQ2100262-04	16SW02-210419 MS	.01	6850/ClO4 DOD			Liquid	10mL	
23	EQ2100262-05	16SW02-210419 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100262-02	1.00µL	EQ2100262-03	1.00µL	EQ2100262-04	1.00µL	EQ2100262-05	1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100460-001	100.00µL	E2100460-002	100.00µL	E2100460-003	100.00µL	E2100460-004	100.00µL	E2100460-005	100.00µL	E2100460-006	100.00µL
E2100460-007	100.00µL	E2100460-008	100.00µL	E2100461-001	100.00µL	E2100461-002	100.00µL	E2100461-003	100.00µL	E2100461-004	100.00µL
E2100464-001	100.00µL	E2100464-002	100.00µL	E2100464-003	100.00µL	E2100464-004	100.00µL	E2100464-005	100.00µL	E2100464-006	100.00µL
EQ2100262-01	100.00µL	EQ2100262-02	100.00µL	EQ2100262-03	100.00µL	EQ2100262-04	100.00µL	EQ2100262-05	100.00µL		

Preparation Information Benchsheet

Prep Run#: 378426 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 4/30/21 12:02

Preparation Steps

Step: Preparation
Started: 4/30/21 12:02
Finished: 4/30/21 14:00
By: KBROWN
Comments

Comments: _____

Reviewed By: KB Date: 4/30/21

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined

Received By: _____ Date: _____ Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100464
Project:	HS21041169	**Date Collected:**	4/21/21 0715
Sample Matrix:	Ground Water	**Date Received:**	4/22/21
Sample Name:	16EW01-210421	**Units:**	µg/L
Lab Code:	E2100464-001	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**41.9**		0.200	0.100	0.0500	2	4/30/21	5/1/21 15:25	378426	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100464
Project:	HS21041169	**Date Collected:**	4/21/21 0800
Sample Matrix:	Ground Water	**Date Received:**	4/22/21
Sample Name:	16EW03-210421	**Units:**	µg/L
Lab Code:	E2100464-002	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/30/21	4/30/21 22:07	378426	722218	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100464
Project:	HS21041169	**Date Collected:**	4/21/21 0850
Sample Matrix:	Ground Water	**Date Received:**	4/22/21
Sample Name:	16IW10-210421	**Units:**	µg/L
Lab Code:	E2100464-003	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.200	0.100	0.0500	2	4/30/21	5/1/21 15:35	378426	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100464
Project:	HS21041169	**Date Collected:**	4/21/21 0945
Sample Matrix:	Ground Water	**Date Received:**	4/22/21
Sample Name:	16RW11-210421	**Units:**	µg/L
Lab Code:	E2100464-004	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0617**	J	0.200	0.100	0.0500	2	4/30/21	5/1/21 15:53	378426	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100464
Project:	HS21041169	**Date Collected:**	4/21/21 0945
Sample Matrix:	Ground Water	**Date Received:**	4/22/21
Sample Name:	16RW11-210421-FD	**Units:**	µg/L
Lab Code:	E2100464-005	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.200	0.100	0.0500	2	4/30/21	5/1/21 16:03	378426	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100464
Project:	HS21041169	**Date Collected:**	4/21/21 1055
Sample Matrix:	Ground Water	**Date Received:**	4/22/21
Sample Name:	16IW20-210421	**Units:**	µg/L
Lab Code:	E2100464-006	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/30/21	4/30/21 22:53	378426	722218	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100464
Project:	HS21041169	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100262-01	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/30/21	4/30/21 19:08	378426	722218	

Accuracy & Precision

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ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100464
Project:	HS21041169	**Date Analyzed:**	4/30/21
Sample Matrix:	Ground Water		

Lab Control Sample Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	As Received
		Extraction Lot:	378426

	Lab Control Sample EQ2100262-02			Duplicate Lab Control Sample EQ2100262-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0976	0.100	98	0.0984	0.100	98	84 - 119	<1	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100464
Project:	HS21041169	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100262-02	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0976**	J	0.100	0.0500	0.0250	1	4/30/21	4/30/21 19:18	378426	722218	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100464
Project:	HS21041169	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100262-03	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0984**	J	0.100	0.0500	0.0250	1	4/30/21	4/30/21 19:27	378426	722218	

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May 07, 2021

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS21041197**

Laboratory Results for: **Longhorn Army Ammunition Plant 16 April 2021**

Dear Vicki Graves ,

ALS Environmental received 3 sample(s) on Apr 22, 2021 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 07-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Work Order: HS21041197

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21041197-01	16WW40-210421	Groundwater		21-Apr-2021 11:40	22-Apr-2021 10:20	☐
HS21041197-02	16WW12-210421	Groundwater		21-Apr-2021 12:25	22-Apr-2021 10:20	☐
HS21041197-03	Trip Blank-210421	Water		21-Apr-2021 00:00	22-Apr-2021 10:20	☐

ALS Houston, US Date: 07-May-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant 16 April 2021
Work Order: HS21041197

Work Order Comments

• The analysis for Perchlorate was subcontracted our ALS Houston TX, High Resolution Lab. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R382623

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R382341

Sample ID: 16WW40-210421 (HS21041197-01)

• Lowest practical dilution for sample HS21041197-01. Sample is lightly foamy.

WetChemistry by Method SM5310B

Batch ID: R382895

Sample ID: HS21041169-03MS

• MS is for an unrelated sample

ALS Houston, US Date: 07-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041197
Sample ID: 16WW40-210421 Lab ID:HS21041197-01
Collection Date: 21-Apr-2021 11:40 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	25-Apr-2021 19:01
1,1-Dichloroethene	**2.8**	J	**1.0**	**2.5**	**5.0**	**ug/L**	5	25-Apr-2021 19:01
1,2-Dichloroethane	**5.6**		**1.0**	**2.5**	**5.0**	**ug/L**	5	25-Apr-2021 19:01
cis-1,2-Dichloroethene	**210**		**1.0**	**2.5**	**5.0**	**ug/L**	5	25-Apr-2021 19:01
Methylene chloride	10	U	2.0	10	10	ug/L	5	25-Apr-2021 19:01
Trichloroethene	**1,000**		**1.0**	**2.5**	**5.0**	**ug/L**	5	25-Apr-2021 19:01
Vinyl chloride	**5.4**		**1.0**	**2.5**	**5.0**	**ug/L**	5	25-Apr-2021 19:01
Surr: 1,2-Dichloroethane-d4	*100*			**0**	*81-118*	*%REC*	*5*	*25-Apr-2021 19:01*
Surr: 4-Bromofluorobenzene	*93.7*			**0**	*85-114*	*%REC*	*5*	*25-Apr-2021 19:01*
Surr: Dibromofluoromethane	*92.3*			**0**	*80-119*	*%REC*	*5*	*25-Apr-2021 19:01*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*5*	*25-Apr-2021 19:01*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	27-Apr-2021 15:50
Ethene	**0.00125**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	27-Apr-2021 15:50
Methane	**0.00957**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	27-Apr-2021 16:22
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**11.3**		**0.500**	**0.500**	**1.00**	**mg/L**	1	03-May-2021 20:23
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	07-May-2021 13:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 07-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041197
Sample ID: 16WW12-210421 Lab ID:HS21041197-02
Collection Date: 21-Apr-2021 12:25 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	25-Apr-2021 20:25
1,1-Dichloroethene	**5.4**	J	**2.0**	**5.0**	**10**	**ug/L**	10	25-Apr-2021 20:25
1,2-Dichloroethane	**7.3**	J	**2.0**	**5.0**	**10**	**ug/L**	10	25-Apr-2021 20:25
cis-1,2-Dichloroethene	**76**		**2.0**	**5.0**	**10**	**ug/L**	10	25-Apr-2021 20:25
Methylene chloride	20	U	4.0	20	20	ug/L	10	25-Apr-2021 20:25
Trichloroethene	**2,100**		**20**	**50**	**100**	**ug/L**	100	25-Apr-2021 20:46
Vinyl chloride	**8.2**	J	**2.0**	**5.0**	**10**	**ug/L**	10	25-Apr-2021 20:25
Surr: 1,2-Dichloroethane-d4	*99.0*			**0**	*81-118*	*%REC*	*10*	*25-Apr-2021 20:25*
Surr: 1,2-Dichloroethane-d4	*99.6*			**0**	*81-118*	*%REC*	*100*	*25-Apr-2021 20:46*
Surr: 4-Bromofluorobenzene	*92.1*			**0**	*85-114*	*%REC*	*10*	*25-Apr-2021 20:25*
Surr: 4-Bromofluorobenzene	*94.2*			**0**	*85-114*	*%REC*	*100*	*25-Apr-2021 20:46*
Surr: Dibromofluoromethane	*95.1*			**0**	*80-119*	*%REC*	*100*	*25-Apr-2021 20:46*
Surr: Dibromofluoromethane	*94.1*			**0**	*80-119*	*%REC*	*10*	*25-Apr-2021 20:25*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*10*	*25-Apr-2021 20:25*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*100*	*25-Apr-2021 20:46*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	07-May-2021 13:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 07-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041197
Sample ID: Trip Blank-210421 Lab ID:HS21041197-03
Collection Date: 21-Apr-2021 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	25-Apr-2021 14:06
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 14:06
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 14:06
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 14:06
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	25-Apr-2021 14:06
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 14:06
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 14:06
Surr: 1,2-Dichloroethane-d4	*92.4*			**0**	*81-118*	*%REC*	*1*	*25-Apr-2021 14:06*
Surr: 4-Bromofluorobenzene	*95.7*			**0**	*85-114*	*%REC*	*1*	*25-Apr-2021 14:06*
Surr: Dibromofluoromethane	*90.7*			**0**	*80-119*	*%REC*	*1*	*25-Apr-2021 14:06*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*25-Apr-2021 14:06*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 07-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041197

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R382341 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21041197-03	Trip Blank-210421	21 Apr 2021 00:00			25 Apr 2021 14:06	1
Batch ID: R382341 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21041197-01	16WW40-210421	21 Apr 2021 11:40			25 Apr 2021 19:01	5
HS21041197-02	16WW12-210421	21 Apr 2021 12:25			25 Apr 2021 20:46	100
HS21041197-02	16WW12-210421	21 Apr 2021 12:25			25 Apr 2021 20:25	10
Batch ID: R382623 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS21041197-01	16WW40-210421	21 Apr 2021 11:40			27 Apr 2021 16:22	1
HS21041197-01	16WW40-210421	21 Apr 2021 11:40			27 Apr 2021 15:50	1
Batch ID: R382895 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS21041197-01	16WW40-210421	21 Apr 2021 11:40			03 May 2021 20:23	1
Batch ID: R383195 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS21041197-01	16WW40-210421	21 Apr 2021 11:40			07 May 2021 13:01	1
HS21041197-02	16WW12-210421	21 Apr 2021 12:25			07 May 2021 13:01	1

ALS Houston, US Date: 07-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041197

QC BATCH REPORT

Batch ID: R382623 (0) **Instrument: FID-4** **Method: DISSOLVED GASES BY RSK-175**

MBLK Sample ID: **MBLK-210427** Units: **mg/L** Analysis Date: **27-Apr-2021 09:48**
Client ID: Run ID: **FID-4_382623** SeqNo: **6067727** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000500	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000500	0.000500								U

LCS Sample ID: **LCS-210427** Units: **mg/L** Analysis Date: **27-Apr-2021 09:57**
Client ID: Run ID: **FID-4_382623** SeqNo: **6067728** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0214	0.00100	0.01804	0	119	75 - 125				
Ethene	0.0184	0.00100	0.0168	0	109	75 - 125				
Methane	0.00936	0.000500	0.009647	0	97.0	75 - 125				

LCSD Sample ID: **LCSD-210427** Units: **mg/L** Analysis Date: **27-Apr-2021 10:08**
Client ID: Run ID: **FID-4_382623** SeqNo: **6067729** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0209	0.00100	0.01804	0	116	75 - 125	0.02138	2.36	30	
Ethene	0.0178	0.00100	0.0168	0	106	75 - 125	0.01836	3.2	30	
Methane	0.00980	0.000500	0.009647	0	102	75 - 125	0.009361	4.55	30	

DUP Sample ID: **HS21041132-05DUP** Units: **mg/L** Analysis Date: **27-Apr-2021 10:35**
Client ID: Run ID: **FID-4_382623** SeqNo: **6067731** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000500	0.00100					0	0	30	U
Ethene	0.000500	0.00100					0	0	30	U
Methane	0.00353	0.000500					0.003447	2.5	30	

The following samples were analyzed in this batch: HS21041197-01

ALS Houston, US Date: 07-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041197

QC BATCH REPORT

Batch ID: R382341 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210425** Units: **ug/L** Analysis Date: **25-Apr-2021 13:45**
Client ID: Run ID: **VOA6_382341** SeqNo: **6060288** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*47.35*	*1.0*	*50*	*0*	*94.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*46.34*	*1.0*	*50*	*0*	*92.7*	*85 - 114*				
Surr: Dibromofluoromethane	*45.8*	*1.0*	*50*	*0*	*91.6*	*80 - 119*				
Surr: Toluene-d8	*53.63*	*1.0*	*50*	*0*	*107*	*89 - 112*				

LCS Sample ID: **VLCSW-210425** Units: **ug/L** Analysis Date: **25-Apr-2021 13:03**
Client ID: Run ID: **VOA6_382341** SeqNo: **6060287** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	21.98	1.0	20	0	110	80 - 119				
1,1-Dichloroethene	17.51	1.0	20	0	87.5	71 - 131				
1,2-Dichloroethane	20.39	1.0	20	0	102	73 - 128				
cis-1,2-Dichloroethene	21.09	1.0	20	0	105	78 - 123				
Methylene chloride	21.19	2.0	20	0	106	74 - 124				
Trichloroethene	19.92	1.0	20	0	99.6	79 - 123				
Vinyl chloride	18.77	1.0	20	0	93.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.91*	*1.0*	*50*	*0*	*108*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.34*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*50.43*	*1.0*	*50*	*0*	*101*	*80 - 119*				
Surr: Toluene-d8	*51.26*	*1.0*	*50*	*0*	*103*	*89 - 112*				

ALS Houston, US Date: 07-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041197

QC BATCH REPORT

Batch ID: R382341 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS21041169-03MS** Units: **ug/L** Analysis Date: **25-Apr-2021 15:09**
Client ID: Run ID: **VOA6_382341** SeqNo: **6060292** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.9	1.0	20	0	99.5	80 - 119				
1,1-Dichloroethene	17.96	1.0	20	0	89.8	71 - 131				
1,2-Dichloroethane	18.76	1.0	20	0	93.8	73 - 128				
cis-1,2-Dichloroethene	32.24	1.0	20	15.28	84.8	78 - 123				
Methylene chloride	18.33	2.0	20	0	91.7	74 - 124				
Trichloroethene	24.38	1.0	20	5.447	94.7	79 - 123				
Vinyl chloride	22.63	1.0	20	2.451	101	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.44*	*1.0*	*50*	*0*	*96.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.76*	*1.0*	*50*	*0*	*97.5*	*85 - 114*				
Surr: Dibromofluoromethane	*47.82*	*1.0*	*50*	*0*	*95.6*	*80 - 119*				
Surr: Toluene-d8	*52.13*	*1.0*	*50*	*0*	*104*	*89 - 112*				

MSD Sample ID: **HS21041169-03MSD** Units: **ug/L** Analysis Date: **25-Apr-2021 15:30**
Client ID: Run ID: **VOA6_382341** SeqNo: **6060293** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.3	1.0	20	0	101	80 - 119	19.9	1.98	20	
1,1-Dichloroethene	17.12	1.0	20	0	85.6	71 - 131	17.96	4.74	20	
1,2-Dichloroethane	18.86	1.0	20	0	94.3	73 - 128	18.76	0.516	20	
cis-1,2-Dichloroethene	32.68	1.0	20	15.28	87.0	78 - 123	32.24	1.34	20	
Methylene chloride	18.48	2.0	20	0	92.4	74 - 124	18.33	0.778	20	
Trichloroethene	23.57	1.0	20	5.447	90.6	79 - 123	24.38	3.38	20	
Vinyl chloride	21.86	1.0	20	2.451	97.0	58 - 137	22.63	3.47	20	
Surr: 1,2-Dichloroethane-d4	*48.73*	*1.0*	*50*	*0*	*97.5*	*81 - 118*	*48.44*	*0.614*	*20*	
Surr: 4-Bromofluorobenzene	*47.89*	*1.0*	*50*	*0*	*95.8*	*85 - 114*	*48.76*	*1.82*	*20*	
Surr: Dibromofluoromethane	*46.89*	*1.0*	*50*	*0*	*93.8*	*80 - 119*	*47.82*	*1.95*	*20*	
Surr: Toluene-d8	*52.33*	*1.0*	*50*	*0*	*105*	*89 - 112*	*52.13*	*0.386*	*20*	

The following samples were analyzed in this batch: HS21041197-01 HS21041197-02 HS21041197-03

ALS Houston, US Date: 07-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041197

QC BATCH REPORT

Batch ID: R382895 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **MBLK-05032021** Units: **mg/L** Analysis Date: **03-May-2021 16:25**
Client ID: Run ID: **TOC_04_382895** SeqNo: **6073620** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	0.500	1.00								U

LCS Sample ID: **LCS-05032021** Units: **mg/L** Analysis Date: **03-May-2021 16:41**
Client ID: Run ID: **TOC_04_382895** SeqNo: **6073621** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.38	1.00	10	0	104	85 - 115				

LCSD Sample ID: **LCSD-05032021** Units: **mg/L** Analysis Date: **03-May-2021 16:57**
Client ID: Run ID: **TOC_04_382895** SeqNo: **6073622** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.36	1.00	10	0	104	85 - 115	10.38	0.193	20	

MS Sample ID: **HS21041169-03MS** Units: **mg/L** Analysis Date: **03-May-2021 19:50**
Client ID: Run ID: **TOC_04_382895** SeqNo: **6073633** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	780.7	1.00	10	784.1	-34.0	80 - 120				SEO

The following samples were analyzed in this batch: HS21041197-01

ALS Houston, US Date: 07-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: **HS21041197**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	21-022-0	26-Mar-2022
Dept of Defense	PJLA L20-507-R2	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2021-2022	30-Apr-2022
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2021	31-Dec-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-21-27	30-Apr-2022

ALS Houston, US Date: 07-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Work Order: HS21041197

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS21041197-01	16WW40-210421	Login	4/22/2021 4:14:55 PM	NDR	WET015
HS21041197-01	16WW40-210421	Login	4/22/2021 4:14:55 PM	NDR	Sub
HS21041197-01	16WW40-210421	Login	4/22/2021 4:14:55 PM	NDR	VOA160
HS21041197-01	16WW40-210421	Login	4/22/2021 4:14:55 PM	NDR	RSK009
HS21041197-01	16WW40-210421	Login	4/22/2021 4:14:55 PM	NDR	WET015

ALS Houston, US Date: 07-May-21

Sample Receipt Checklist

Work Order ID: HS21041197 **Date/Time Received:** 22-Apr-2021 10:20

Client Name: CBI-Houston **Received by:** Pablo Marinez

Completed By: /S/ Nilesh D. Ranchod (eSignature) 22-Apr-2021 16:38 (Date/Time) **Reviewed by:** /S/ RJ Modashia (eSignature) 23-Apr-2021 08:55 (Date/Time)

Matrices: **Water** Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	0.4°C UC/C	IR31	
Cooler(s)/Kit(s):	45539		
Date/Time sample(s) sent to storage:	4/22/2021 16:50		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Page 1 of 1

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 601032
Job: **LHAAP 16 April 2021**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16WW40-210421	WG	4/21/21/ 1140		9	X	X	X			X					
16WW12-210421	WG	4/21/21/ 1225		4	X					X					
TRIP BLANK-210421	W	4/21/21		2	X										

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
[signature]	4/21/21	1330	[signature]	4/22/21	10:00						

For Lab Use Only									
Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

45534 0.4C IR31 CFU

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant 16 April 2021

HS21041197

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

U5539

CUSTODY SEAL

Date: 4/21/21 Time: 1330
Name: Scott Beesinger
Company: BHMRA

Seal Broken By:
Date: 04122121

U5539

APR 2 2 2021

A

Must Deliver Next Business Da
Time and Tempature Sensitive!

U5539

ORIGIN ID:SGRA (903) 930-8193
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFRASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 29MAR21
ACTWGT: 1.00 LB MAN
CAD: 6221247/CAFE3409
DIMS: 26x14x1 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-BO 77443-RJ

RMA:

FedEx Express

E

FedEx.
TRK# 0221 9473 0841 7502

THU - 22 APR AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

EID: 5090257 21Apr2021 GGGA 5H0G3/F9A6/1B23

May 07, 2021 Service Request No:E2100470

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: HS21041197

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory April 26, 2021
For your reference, these analyses have been assigned our service request number **E2100470.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100470
Project:	HS21041197	**Date Received:**	04/26/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Two samples was received for analysis at ALS Environmental in Houston on 04/26/21.

The samples were received in good condition and is consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100263: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS and DLCS recoveries are within QC limits.

DoD certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2100470
Project: HS21041197

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100470-001	16WW40-210421	4/21/2021	1140
E2100470-002	16WW12-210421	4/21/2021	1225

Service Request Summary

Folder #: **E2100470**
Client Name: ALS Environmental - US
Project Name: HS21041197
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 04/26/21
Internal Due Date: 5/6/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21041197
EDD: No EDD Specified

2 125 mL-Plastic Bottle HDPE NM CLEAR Unpreserved
Location: EHRMS-WIC 4C
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100470-001	16WW40-210421	Ground Water	04/21/21 1140	**IV**
E2100470-002	16WW12-210421	Ground Water	04/21/21 1225	**IV**

Service Request Summary

Folder #: **E2100470**
Client Name: ALS Environmental - US
Project Name: HS21041197
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 04/26/21
Internal Due Date: 5/6/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21041197
EDD: No EDD Specified

2 125 mL-Plastic Bottle HDPE NM CLEAR Unpreserved
Location: EHRMS-WIC 4C
Pressure Gas:

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

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ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	21-022-0	3/26/2022
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2021-2022	4/30/2022
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Louisiana Department of Health and Hospitals	LA028-2021	12/31/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Minnesota Department of Health	2021671	12/31/2021
Nevada Department of Concervation and Natural Resources	TX026932021-4	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209421	4/24/2022
New Jersey Department of Environmental Protection	TX008	6/30/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2021	4/30/2022
United States Department of Agriculture	P330-19-00299	10/10/2022

Chain of Custody

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Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **15975**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS21041197
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21041197-01**	**16WW40-210421**	**Groundwater**	**21 Apr 2021 11:40**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			06 May 2021
2.	**HS21041197-02**	**16WW12-210421**	**Groundwater**	**21 Apr 2021 12:25**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			06 May 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: _____

Received By: CORE+L Date/Time: 4/22/21 0800

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

Cooler Receipt Form

Project Chemist [illegible]

Client/Project [illegible]

Thermometer ID [illegible]

Date/Time Received: [illegible] Initials: [illegible]

Date/Time Logged in: [illegible] Initials [illegible]

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ◉ Courier (ALS) ○ Client

2. Samples received in: ◉ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ◉ No

Were they intact? ○ Yes ○ No ◉ N/A

Were they signed and dated? ○ Yes ○ No ◉ N/A

If yes, how many and where?

4. Packing Material: ○ Inserts ◉ Baggies ○ Bubble Wrap ○ Gel Packs ◉ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
N/A		[illegible]	[illegible]	[illegible]	[illegible]	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ◉ Yes ○ No

7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ◉ Yes ○ No

8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ◉ Yes ○ No

9. Were appropriate bottles/containers and volumes received for the requested tests? ◉ Yes ○ No

10. Did sample labels and tags agree with custody documents? ◉ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

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www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 378427 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 4/30/21 12:06

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100469-001	16WW27-210422	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2100469-002	16WW43-210422	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2100469-003	16WW23-210422	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2100469-004	16WW24-210422	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100469-005	16IW09-210422	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100469-006	16WW49-210422	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100469-007	16WW48-210422	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2100469-008	16EW06-210422	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2100470-001	16WW40-210421	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2100470-002	16WW12-210421	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2100492-001	HBW7_042721	.01	6850/ClO4 DOD			Surface Water	10mL	
12	E2100492-002	HBW10_042721	.01	6850/ClO4 DOD			Surface Water	10mL	
13	E2100492-003	HBW10_042721_a	.01	6850/ClO4 DOD			Surface Water	10mL	
14	E2100492-004	HBW1_042721	.01	6850/ClO4 DOD			Surface Water	10mL	
15	E2100492-005	GPW1_042721	.01	6850/ClO4 DOD			Surface Water	10mL	
16	E2100492-006	GPW3_042721	.01	6850/ClO4 DOD			Surface Water	10mL	
17	E2100493-001	LH18/24-SP650_042721_BIX	.01	6850/ClO4 DOD			Surface Water	10mL	
18	EQ2100263-01	MB		6850/ClO4 DOD			Liquid	10mL	
19	EQ2100263-02	LCS		6850/ClO4 DOD			Liquid	10mL	
20	EQ2100263-03	DLCS		6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100263-02 1.00µL EQ2100263-03 1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100469-001	100.00µL	E2100469-002	100.00µL	E2100469-003	100.00µL	E2100469-004	100.00µL	E2100469-005	100.00µL	E2100469-006	100.00µL
E2100469-007	100.00µL	E2100469-008	100.00µL	E2100470-001	100.00µL	E2100470-002	100.00µL	E2100492-001	100.00µL	E2100492-002	100.00µL
E2100492-003	100.00µL	E2100492-004	100.00µL	E2100492-005	100.00µL	E2100492-006	100.00µL	E2100493-001	100.00µL	EQ2100263-01	100.00µL
EQ2100263-02	100.00µL	EQ2100263-03	100.00µL								

Preparation Information Benchsheet

Prep Run#: 378427
Team: Semivoa GCMS/GRIVERA
Prep WorkFlow: GenExt28Day
Prep Method: Method
Status: Prepped
Prep Date/Time: 4/30/21 12:06

Preparation Steps

Step: Preparation
Started: 4/30/21 12:06
Finished: 4/30/21 14:30
By: KBROWN
Comments

Comments: _____

Reviewed By: KB Date: 4/30/21

Chain of Custody

Relinquished By: _____ Date: _____

Received By: _____ Date: _____

Extracts Examined
Yes No

Analytical Results

ALS Environmental - Houston HRMS
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ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100470
Project:	HS21041197	**Date Collected:**	4/21/21 1140
Sample Matrix:	Ground Water	**Date Received:**	4/26/21
Sample Name:	16WW40-210421	**Units:**	µg/L
Lab Code:	E2100470-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.880**		0.200	0.100	0.0500	2	4/30/21	5/3/21 10:41	378427	722497	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100470
Project:	HS21041197	**Date Collected:**	4/21/21 1225
Sample Matrix:	Ground Water	**Date Received:**	4/26/21
Sample Name:	16WW12-210421	**Units:**	µg/L
Lab Code:	E2100470-002	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**42.1**		0.200	0.100	0.0500	2	4/30/21	5/3/21 10:51	378427	722497	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100470
Project:	HS21041197	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100263-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/30/21	5/1/21 16:22	378427	722220	

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21041197
Sample Matrix: Ground Water

Service Request: E2100470
Date Analyzed: 5/ 1/21

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Units: µg/L
Basis: NA

Extraction Lot: 378427

	Lab Control Sample EQ2100263-02			Duplicate Lab Control Sample EQ2100263-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0981	0.100	98	0.112	0.100	112	84 - 119	13	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100470
Project:	HS21041197	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100263-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0981**	J	0.100	0.0500	0.0250	1	4/30/21	5/1/21 16:31	378427	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100470
Project:	HS21041197	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100263-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.112**		0.100	0.0500	0.0250	1	4/30/21	5/1/21 16:40	378427	722220	

10450 Stancliff Rd. Suite 210
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May 10, 2021

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
10333 Richmond Ave
Ste 1030
Houston, TX 77042

Work Order: **HS21041255**

Laboratory Results for: **Longhorn Army Ammunition Plant 16 April 2021**

Dear Vicki Graves ,

ALS Environmental received 9 sample(s) on Apr 23, 2021 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Work Order: HS21041255

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21041255-01	16WW27-210422	Groundwater		22-Apr-2021 07:40	23-Apr-2021 10:15	☐
HS21041255-02	16WW43-210422	Groundwater		22-Apr-2021 08:20	23-Apr-2021 10:15	☐
HS21041255-03	16WW23-210422	Groundwater		22-Apr-2021 09:05	23-Apr-2021 10:15	☐
HS21041255-04	16WW24-210422	Groundwater		22-Apr-2021 09:45	23-Apr-2021 10:15	☐
HS21041255-05	16IW09-210422	Groundwater		22-Apr-2021 10:30	23-Apr-2021 10:15	☐
HS21041255-06	16WW49-210422	Groundwater		22-Apr-2021 11:20	23-Apr-2021 10:15	☐
HS21041255-07	16WW48-210422	Groundwater		22-Apr-2021 12:05	23-Apr-2021 10:15	☐
HS21041255-08	16EW06-210422	Groundwater		22-Apr-2021 12:55	23-Apr-2021 10:15	☐
HS21041255-09	Trip Blank-210422	Water	CG-121520-1075	22-Apr-2021 00:00	23-Apr-2021 10:15	☐

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant 16 April 2021
Work Order: HS21041255

Work Order Comments

• Due to the sample matrix (Oil/Organic) for sample 16EW06-210422, analysis for TOC and RSK175 can not be performed.

• The analysis for Perchlorate was subcontracted our ALS Houston TX, High Resolution Lab. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R382623

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R382419

Sample ID: 16EW06-210422 (HS21041255-08)

• Lowest practical dilution for sample HS21041255-08. Sample is oil.

Batch ID: R382341

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM5310B

Batch ID: R382918

Sample ID: HS21041275-03MS

• MS is for an unrelated sample

Batch ID: R383003

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: 165463

Sample ID: 16EW06-210422 (HS21041255-08)

• Sample ran at 10X due to nasty oily matrix

Sample ID: HS21041427-25MS

• MS and MSD are for an unrelated sample (Sulfate)

Batch ID: R382366

Sample ID: 16WW48-210422 (HS21041255-07)

• Sample ran at 5X due to high concentration of Sulfate

Sample ID: HS21040612-03MS

• MS and MSD are for an unrelated sample (Sulfate)

Batch ID: R382840

Sample ID: HS21041595-02MS

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant 16 April 2021
Work Order: HS21041255

WetChemistry by Method SW9056

Batch ID: R382840

- MS and MSD are for an unrelated sample (Sulfate)

WetChemistry by Method SM2320B

Batch ID: 165053,R382327

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041255
Sample ID: 16WW27-210422 Lab ID:HS21041255-01
Collection Date: 22-Apr-2021 07:40 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	25-Apr-2021 16:54
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 16:54
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 16:54
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 16:54
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	25-Apr-2021 16:54
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 16:54
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 16:54
Surr: 1,2-Dichloroethane-d4	*95.8*			**0**	*81-118*	*%REC*	*1*	*25-Apr-2021 16:54*
Surr: 4-Bromofluorobenzene	*93.6*			**0**	*85-114*	*%REC*	*1*	*25-Apr-2021 16:54*
Surr: Dibromofluoromethane	*91.8*			**0**	*80-119*	*%REC*	*1*	*25-Apr-2021 16:54*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*25-Apr-2021 16:54*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	10-May-2021 17:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041255
Sample ID: 16WW43-210422 Lab ID:HS21041255-02
Collection Date: 22-Apr-2021 08:20 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	25-Apr-2021 17:16
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 17:16
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 17:16
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 17:16
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	25-Apr-2021 17:16
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 17:16
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 17:16
Surr: 1,2-Dichloroethane-d4	*98.3*			**0**	*81-118*	*%REC*	*1*	*25-Apr-2021 17:16*
Surr: 4-Bromofluorobenzene	*94.0*			**0**	*85-114*	*%REC*	*1*	*25-Apr-2021 17:16*
Surr: Dibromofluoromethane	*94.7*			**0**	*80-119*	*%REC*	*1*	*25-Apr-2021 17:16*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*25-Apr-2021 17:16*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	10-May-2021 17:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041255
Sample ID: 16WW23-210422 Lab ID:HS21041255-03
Collection Date: 22-Apr-2021 09:05 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	25-Apr-2021 17:37
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 17:37
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 17:37
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 17:37
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	25-Apr-2021 17:37
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 17:37
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 17:37
Surr: 1,2-Dichloroethane-d4	*98.6*			**0**	*81-118*	*%REC*	*1*	*25-Apr-2021 17:37*
Surr: 4-Bromofluorobenzene	*91.0*			**0**	*85-114*	*%REC*	*1*	*25-Apr-2021 17:37*
Surr: Dibromofluoromethane	*93.6*			**0**	*80-119*	*%REC*	*1*	*25-Apr-2021 17:37*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*25-Apr-2021 17:37*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	10-May-2021 17:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041255
Sample ID: 16WW24-210422 Lab ID:HS21041255-04
Collection Date: 22-Apr-2021 09:45 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	25-Apr-2021 17:58
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 17:58
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 17:58
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 17:58
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	25-Apr-2021 17:58
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 17:58
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 17:58
Surr: 1,2-Dichloroethane-d4	*99.8*			**0**	*81-118*	*%REC*	*1*	*25-Apr-2021 17:58*
Surr: 4-Bromofluorobenzene	*94.1*			**0**	*85-114*	*%REC*	*1*	*25-Apr-2021 17:58*
Surr: Dibromofluoromethane	*93.7*			**0**	*80-119*	*%REC*	*1*	*25-Apr-2021 17:58*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*25-Apr-2021 17:58*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	10-May-2021 17:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
Sample ID: 16IW09-210422
Collection Date: 22-Apr-2021 10:30

ANALYTICAL REPORT
WorkOrder:HS21041255
Lab ID:HS21041255-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	25-Apr-2021 18:19
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 18:19
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 18:19
cis-1,2-Dichloroethene	**3.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	25-Apr-2021 18:19
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	25-Apr-2021 18:19
Trichloroethene	**0.62**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	25-Apr-2021 18:19
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 18:19
Surr: 1,2-Dichloroethane-d4	*98.3*			**0**	*81-118*	*%REC*	*1*	*25-Apr-2021 18:19*
Surr: 4-Bromofluorobenzene	*93.3*			**0**	*85-114*	*%REC*	*1*	*25-Apr-2021 18:19*
Surr: Dibromofluoromethane	*92.9*			**0**	*80-119*	*%REC*	*1*	*25-Apr-2021 18:19*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*25-Apr-2021 18:19*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	27-Apr-2021 16:00
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	27-Apr-2021 16:00
Methane	**3.50**		**0.0214**	**0.100**	**0.100**	**mg/L**	200	27-Apr-2021 16:49
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**598**		**5.00**	**5.00**	**5.00**	**mg/L**	1	24-Apr-2021 14:24
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**572**		**25.0**	**25.0**	**50.0**	**mg/L**	50	04-May-2021 23:18
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**4.13**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	23-Apr-2021 13:12
Nitrogen, Nitrate (As N)	**0.0908**	J	**0.0300**	**0.100**	**0.100**	**mg/L**	1	23-Apr-2021 13:12
Sulfate	**4.75**		**0.200**	**0.500**	**0.500**	**mg/L**	1	23-Apr-2021 13:12
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	10-May-2021 17:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041255
Sample ID: 16WW49-210422 Lab ID:HS21041255-06
Collection Date: 22-Apr-2021 11:20 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	25-Apr-2021 18:40
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 18:40
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 18:40
cis-1,2-Dichloroethene	**100**		**0.20**	**0.50**	**1.0**	**ug/L**	1	25-Apr-2021 18:40
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	25-Apr-2021 18:40
Trichloroethene	**11**		**0.20**	**0.50**	**1.0**	**ug/L**	1	25-Apr-2021 18:40
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 18:40
Surr: 1,2-Dichloroethane-d4	*99.8*			**0**	*81-118*	*%REC*	*1*	*25-Apr-2021 18:40*
Surr: 4-Bromofluorobenzene	*93.1*			**0**	*85-114*	*%REC*	*1*	*25-Apr-2021 18:40*
Surr: Dibromofluoromethane	*93.2*			**0**	*80-119*	*%REC*	*1*	*25-Apr-2021 18:40*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*25-Apr-2021 18:40*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	10-May-2021 17:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041255
Sample ID: 16WW48-210422 Lab ID:HS21041255-07
Collection Date: 22-Apr-2021 12:05 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	25	U	7.5	25	25	ug/L	25	25-Apr-2021 21:49
1,1-Dichloroethene	**38**		**5.0**	**12**	**25**	**ug/L**	25	25-Apr-2021 21:49
1,2-Dichloroethane	**39**		**5.0**	**12**	**25**	**ug/L**	25	25-Apr-2021 21:49
cis-1,2-Dichloroethene	**17,000**		**50**	**120**	**250**	**ug/L**	250	26-Apr-2021 16:45
Methylene chloride	50	U	10	50	50	ug/L	25	25-Apr-2021 21:49
Trichloroethene	**15,000**		**50**	**120**	**250**	**ug/L**	250	26-Apr-2021 16:45
Vinyl chloride	**16**	J	**5.0**	**12**	**25**	**ug/L**	25	25-Apr-2021 21:49
Surr: 1,2-Dichloroethane-d4	*99.2*			**0**	*81-118*	*%REC*	*25*	*25-Apr-2021 21:49*
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*250*	*26-Apr-2021 16:45*
Surr: 4-Bromofluorobenzene	*95.2*			**0**	*85-114*	*%REC*	*25*	*25-Apr-2021 21:49*
Surr: 4-Bromofluorobenzene	*93.2*			**0**	*85-114*	*%REC*	*250*	*26-Apr-2021 16:45*
Surr: Dibromofluoromethane	*91.1*			**0**	*80-119*	*%REC*	*25*	*25-Apr-2021 21:49*
Surr: Dibromofluoromethane	*93.2*			**0**	*80-119*	*%REC*	*250*	*26-Apr-2021 16:45*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*25*	*25-Apr-2021 21:49*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*250*	*26-Apr-2021 16:45*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	27-Apr-2021 16:08
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	27-Apr-2021 16:08
Methane	**0.00283**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	27-Apr-2021 16:08
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**356**		**5.00**	**5.00**	**5.00**	**mg/L**	1	24-Apr-2021 14:30
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**13.2**		**0.500**	**0.500**	**1.00**	**mg/L**	1	03-May-2021 22:17
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**7.59**		**0.150**	**0.500**	**0.500**	**mg/L**	5	23-Apr-2021 13:30
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	23-Apr-2021 13:30
Sulfate	**2,300**		**10.0**	**25.0**	**25.0**	**mg/L**	50	30-Apr-2021 22:31
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	10-May-2021 17:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041255
Sample ID: 16EW06-210422 Lab ID:HS21041255-08
Collection Date: 22-Apr-2021 12:55 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1,000	U	300	1000	1000	ug/L	1000	26-Apr-2021 14:18
1,1-Dichloroethene	500	U	200	500	1000	ug/L	1000	26-Apr-2021 14:18
1,2-Dichloroethane	500	U	200	500	1000	ug/L	1000	26-Apr-2021 14:18
cis-1,2-Dichloroethene	500	U	200	500	1000	ug/L	1000	26-Apr-2021 14:18
Methylene chloride	2,000	U	400	2000	2000	ug/L	1000	26-Apr-2021 14:18
Trichloroethene	500	U	200	500	1000	ug/L	1000	26-Apr-2021 14:18
Vinyl chloride	500	U	200	500	1000	ug/L	1000	26-Apr-2021 14:18
Surr: 1,2-Dichloroethane-d4	*97.1*			**0**	*81-118*	*%REC*	*1000*	*26-Apr-2021 14:18*
Surr: 4-Bromofluorobenzene	*95.4*			**0**	*85-114*	*%REC*	*1000*	*26-Apr-2021 14:18*
Surr: Dibromofluoromethane	*92.8*			**0**	*80-119*	*%REC*	*1000*	*26-Apr-2021 14:18*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1000*	*26-Apr-2021 14:18*
ALKALINITY BY SM2320B		**Method:SM2320B**				Prep:ASTM Leachate / 24-Apr-2021		Analyst: TH
Alkalinity, Bicarbonate (As CaCO3)	0	aU	10.0	0	10.0	mg/Kg	1	24-Apr-2021 15:14
Alkalinity, Carbonate (As CaCO3)	0	aU	10.0	0	10.0	mg/Kg	1	24-Apr-2021 15:14
Alkalinity, Hydroxide (As CaCO3)	0	aU	10.0	0	10.0	mg/Kg	1	24-Apr-2021 15:14
Alkalinity, Total (As CaCO3)	0	aU	10.0	0	10.0	mg/Kg	1	24-Apr-2021 15:14
ANIONS BY SW9056A		**Method:SW9056**				Prep:SW9056 / 05-May-2021		Analyst: YP
Bromide	9.89	U	2.97	9.89	9.89	mg/Kg	10	06-May-2021 10:49
Nitrogen, Nitrate (As N)	9.89	U	2.97	9.89	9.89	mg/Kg	10	06-May-2021 10:49
Sulfate	49.4	U	19.8	49.4	49.4	mg/Kg	10	06-May-2021 10:49
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	10-May-2021 17:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 16 April 2021 WorkOrder:HS21041255
Sample ID: Trip Blank-210422 Lab ID:HS21041255-09
Collection Date: 22-Apr-2021 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	25-Apr-2021 14:27
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 14:27
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 14:27
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 14:27
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	25-Apr-2021 14:27
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 14:27
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	25-Apr-2021 14:27
Surr: 1,2-Dichloroethane-d4	*95.5*			**0**	*81-118*	*%REC*	*1*	*25-Apr-2021 14:27*
Surr: 4-Bromofluorobenzene	*94.3*			**0**	*85-114*	*%REC*	*1*	*25-Apr-2021 14:27*
Surr: Dibromofluoromethane	*92.8*			**0**	*80-119*	*%REC*	*1*	*25-Apr-2021 14:27*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*25-Apr-2021 14:27*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Weight / Prep Log

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041255

Batch ID: 165053 **Start Date:** 24 Apr 2021 08:00 **End Date:**
Method: ALK LEACH **Prep Code:** ALK LEACH PREP

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS21041255-08		5 (grams)	50 (mL)	10	120 mL Plastic Neat

Batch ID: 165463 **Start Date:** 05 May 2021 12:00 **End Date:** 05 May 2021 15:00
Method: 9056 ANIONS SOIL PREP **Prep Code:** 9056_S_PR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS21041255-08		5.0561 (g)	50 (mL)	9.889	120 mL Plastic Neat

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041255

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 165053 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS21041255-08	16EW06-210422	22 Apr 2021 12:55		24 Apr 2021 08:00	24 Apr 2021 15:14	1
Batch ID: 165463 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21041255-08	16EW06-210422	22 Apr 2021 12:55		05 May 2021 12:00	06 May 2021 10:49	10
Batch ID: R382327 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS21041255-05	16IW09-210422	22 Apr 2021 10:30			24 Apr 2021 14:24	1
HS21041255-07	16WW48-210422	22 Apr 2021 12:05			24 Apr 2021 14:30	1
Batch ID: R382341 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21041255-09	Trip Blank-210422	22 Apr 2021 00:00			25 Apr 2021 14:27	1
Batch ID: R382341 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21041255-01	16WW27-210422	22 Apr 2021 07:40			25 Apr 2021 16:54	1
HS21041255-02	16WW43-210422	22 Apr 2021 08:20			25 Apr 2021 17:16	1
HS21041255-03	16WW23-210422	22 Apr 2021 09:05			25 Apr 2021 17:37	1
HS21041255-04	16WW24-210422	22 Apr 2021 09:45			25 Apr 2021 17:58	1
HS21041255-05	16IW09-210422	22 Apr 2021 10:30			25 Apr 2021 18:19	1
HS21041255-06	16WW49-210422	22 Apr 2021 11:20			25 Apr 2021 18:40	1
HS21041255-07	16WW48-210422	22 Apr 2021 12:05			25 Apr 2021 21:49	25
Batch ID: R382366 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21041255-05	16IW09-210422	22 Apr 2021 10:30			23 Apr 2021 13:12	1
HS21041255-07	16WW48-210422	22 Apr 2021 12:05			23 Apr 2021 13:30	5
Batch ID: R382419 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21041255-07	16WW48-210422	22 Apr 2021 12:05			26 Apr 2021 16:45	250
HS21041255-08	16EW06-210422	22 Apr 2021 12:55			26 Apr 2021 14:18	1000
Batch ID: R382623 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS21041255-05	16IW09-210422	22 Apr 2021 10:30			27 Apr 2021 16:49	200
HS21041255-05	16IW09-210422	22 Apr 2021 10:30			27 Apr 2021 16:00	1
HS21041255-07	16WW48-210422	22 Apr 2021 12:05			27 Apr 2021 16:08	1
Batch ID: R382840 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21041255-07	16WW48-210422	22 Apr 2021 12:05			30 Apr 2021 22:31	50
Batch ID: R382918 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS21041255-07	16WW48-210422	22 Apr 2021 12:05			03 May 2021 22:17	1
Batch ID: R383003 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS21041255-05	16IW09-210422	22 Apr 2021 10:30			04 May 2021 23:18	50

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041255

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R383321 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS21041255-01	16WW27-210422	22 Apr 2021 07:40			10 May 2021 17:37	1
HS21041255-02	16WW43-210422	22 Apr 2021 08:20			10 May 2021 17:37	1
HS21041255-03	16WW23-210422	22 Apr 2021 09:05			10 May 2021 17:37	1
HS21041255-04	16WW24-210422	22 Apr 2021 09:45			10 May 2021 17:37	1
HS21041255-05	16IW09-210422	22 Apr 2021 10:30			10 May 2021 17:37	1
HS21041255-06	16WW49-210422	22 Apr 2021 11:20			10 May 2021 17:37	1
HS21041255-07	16WW48-210422	22 Apr 2021 12:05			10 May 2021 17:37	1
HS21041255-08	16EW06-210422	22 Apr 2021 12:55			10 May 2021 17:37	1

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041255

QC BATCH REPORT

Batch ID: R382623 (0) **Instrument: FID-4** **Method: DISSOLVED GASES BY RSK-175**

MBLK Sample ID: **MBLK-210427** Units: **mg/L** Analysis Date: **27-Apr-2021 09:48**
Client ID: Run ID: **FID-4_382623** SeqNo: **6067727** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000500	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000500	0.000500								U

LCS Sample ID: **LCS-210427** Units: **mg/L** Analysis Date: **27-Apr-2021 09:57**
Client ID: Run ID: **FID-4_382623** SeqNo: **6067728** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0214	0.00100	0.01804	0	119	75 - 125				
Ethene	0.0184	0.00100	0.0168	0	109	75 - 125				
Methane	0.00936	0.000500	0.009647	0	97.0	75 - 125				

LCSD Sample ID: **LCSD-210427** Units: **mg/L** Analysis Date: **27-Apr-2021 10:08**
Client ID: Run ID: **FID-4_382623** SeqNo: **6067729** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0209	0.00100	0.01804	0	116	75 - 125	0.02138	2.36	30	
Ethene	0.0178	0.00100	0.0168	0	106	75 - 125	0.01836	3.2	30	
Methane	0.00980	0.000500	0.009647	0	102	75 - 125	0.009361	4.55	30	

DUP Sample ID: **HS21041132-05DUP** Units: **mg/L** Analysis Date: **27-Apr-2021 10:35**
Client ID: Run ID: **FID-4_382623** SeqNo: **6067731** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000500	0.00100					0	0	30	U
Ethene	0.000500	0.00100					0	0	30	U
Methane	0.00353	0.000500					0.003447	2.5	30	

The following samples were analyzed in this batch: HS21041255-05 HS21041255-07

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041255

QC BATCH REPORT

Batch ID: R382341 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210425** Units: **ug/L** Analysis Date: **25-Apr-2021 13:45**
Client ID: Run ID: **VOA6_382341** SeqNo: **6060288** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*47.35*	*1.0*	*50*	*0*	*94.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*46.34*	*1.0*	*50*	*0*	*92.7*	*85 - 114*				
Surr: Dibromofluoromethane	*45.8*	*1.0*	*50*	*0*	*91.6*	*80 - 119*				
Surr: Toluene-d8	*53.63*	*1.0*	*50*	*0*	*107*	*89 - 112*				

LCS Sample ID: **VLCSW-210425** Units: **ug/L** Analysis Date: **25-Apr-2021 13:03**
Client ID: Run ID: **VOA6_382341** SeqNo: **6060287** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	21.98	1.0	20	0	110	80 - 119				
1,1-Dichloroethene	17.51	1.0	20	0	87.5	71 - 131				
1,2-Dichloroethane	20.39	1.0	20	0	102	73 - 128				
cis-1,2-Dichloroethene	21.09	1.0	20	0	105	78 - 123				
Methylene chloride	21.19	2.0	20	0	106	74 - 124				
Trichloroethene	19.92	1.0	20	0	99.6	79 - 123				
Vinyl chloride	18.77	1.0	20	0	93.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.91*	*1.0*	*50*	*0*	*108*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.34*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*50.43*	*1.0*	*50*	*0*	*101*	*80 - 119*				
Surr: Toluene-d8	*51.26*	*1.0*	*50*	*0*	*103*	*89 - 112*				

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041255

QC BATCH REPORT

Batch ID: R382341 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS21041169-03MS** Units: **ug/L** Analysis Date: **25-Apr-2021 15:09**
Client ID: Run ID: **VOA6_382341** SeqNo: **6060292** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.9	1.0	20	0	99.5	80 - 119				
1,1-Dichloroethene	17.96	1.0	20	0	89.8	71 - 131				
1,2-Dichloroethane	18.76	1.0	20	0	93.8	73 - 128				
cis-1,2-Dichloroethene	32.24	1.0	20	15.28	84.8	78 - 123				
Methylene chloride	18.33	2.0	20	0	91.7	74 - 124				
Trichloroethene	24.38	1.0	20	5.447	94.7	79 - 123				
Vinyl chloride	22.63	1.0	20	2.451	101	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.44*	*1.0*	*50*	*0*	*96.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.76*	*1.0*	*50*	*0*	*97.5*	*85 - 114*				
Surr: Dibromofluoromethane	*47.82*	*1.0*	*50*	*0*	*95.6*	*80 - 119*				
Surr: Toluene-d8	*52.13*	*1.0*	*50*	*0*	*104*	*89 - 112*				

MSD Sample ID: **HS21041169-03MSD** Units: **ug/L** Analysis Date: **25-Apr-2021 15:30**
Client ID: Run ID: **VOA6_382341** SeqNo: **6060293** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.3	1.0	20	0	101	80 - 119	19.9	1.98	20	
1,1-Dichloroethene	17.12	1.0	20	0	85.6	71 - 131	17.96	4.74	20	
1,2-Dichloroethane	18.86	1.0	20	0	94.3	73 - 128	18.76	0.516	20	
cis-1,2-Dichloroethene	32.68	1.0	20	15.28	87.0	78 - 123	32.24	1.34	20	
Methylene chloride	18.48	2.0	20	0	92.4	74 - 124	18.33	0.778	20	
Trichloroethene	23.57	1.0	20	5.447	90.6	79 - 123	24.38	3.38	20	
Vinyl chloride	21.86	1.0	20	2.451	97.0	58 - 137	22.63	3.47	20	
Surr: 1,2-Dichloroethane-d4	*48.73*	*1.0*	*50*	*0*	*97.5*	*81 - 118*	*48.44*	*0.614*	*20*	
Surr: 4-Bromofluorobenzene	*47.89*	*1.0*	*50*	*0*	*95.8*	*85 - 114*	*48.76*	*1.82*	*20*	
Surr: Dibromofluoromethane	*46.89*	*1.0*	*50*	*0*	*93.8*	*80 - 119*	*47.82*	*1.95*	*20*	
Surr: Toluene-d8	*52.33*	*1.0*	*50*	*0*	*105*	*89 - 112*	*52.13*	*0.386*	*20*	

The following samples were analyzed in this batch:

HS21041255-01	HS21041255-02	HS21041255-03	HS21041255-04
HS21041255-05	HS21041255-06	HS21041255-07	HS21041255-09

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041255

QC BATCH REPORT

Batch ID: R382419 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210426** Units: **ug/L** Analysis Date: **26-Apr-2021 12:54**
Client ID: Run ID: **VOA6_382419** SeqNo: **6062394** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*48.67*	*1.0*	*50*	*0*	*97.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*45.33*	*1.0*	*50*	*0*	*90.7*	*85 - 114*				
Surr: Dibromofluoromethane	*46.68*	*1.0*	*50*	*0*	*93.4*	*80 - 119*				
Surr: Toluene-d8	*53.57*	*1.0*	*50*	*0*	*107*	*89 - 112*				

LCS Sample ID: **VLCSW-210426** Units: **ug/L** Analysis Date: **26-Apr-2021 12:12**
Client ID: Run ID: **VOA6_382419** SeqNo: **6062393** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	21.08	1.0	20	0	105	80 - 119				
1,1-Dichloroethene	21.2	1.0	20	0	106	71 - 131				
1,2-Dichloroethane	20.77	1.0	20	0	104	73 - 128				
cis-1,2-Dichloroethene	22.21	1.0	20	0	111	78 - 123				
Methylene chloride	23.07	2.0	20	0	115	74 - 124				
Trichloroethene	20.69	1.0	20	0	103	79 - 123				
Vinyl chloride	23.61	1.0	20	0	118	58 - 137				
Surr: 1,2-Dichloroethane-d4	*54.78*	*1.0*	*50*	*0*	*110*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.08*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*51.56*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*51.53*	*1.0*	*50*	*0*	*103*	*89 - 112*				

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041255

QC BATCH REPORT

Batch ID: R382419 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS21041306-17MS** Units: **ug/L** Analysis Date: **26-Apr-2021 16:03**
Client ID: Run ID: **VOA6_382419** SeqNo: **6062402** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.26	1.0	20	0	91.3	80 - 119				
1,1-Dichloroethene	19.73	1.0	20	0	98.7	71 - 131				
1,2-Dichloroethane	18.42	1.0	20	0	92.1	73 - 128				
cis-1,2-Dichloroethene	18.83	1.0	20	0	94.1	78 - 123				
Methylene chloride	19.71	2.0	20	0	98.5	74 - 124				
Trichloroethene	19.73	1.0	20	0	98.7	79 - 123				
Vinyl chloride	21.68	1.0	20	0	108	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.61*	*1.0*	*50*	*0*	*97.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.54*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*45.93*	*1.0*	*50*	*0*	*91.9*	*80 - 119*				
Surr: Toluene-d8	*51.67*	*1.0*	*50*	*0*	*103*	*89 - 112*				

MS Sample ID: **HS21041306-09MS** Units: **ug/L** Analysis Date: **26-Apr-2021 15:21**
Client ID: Run ID: **VOA6_382419** SeqNo: **6062400** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.86	1.0	20	0	94.3	80 - 119				
1,1-Dichloroethene	19.57	1.0	20	0	97.8	71 - 131				
1,2-Dichloroethane	19.87	1.0	20	0	99.4	73 - 128				
cis-1,2-Dichloroethene	19.05	1.0	20	0	95.2	78 - 123				
Methylene chloride	19.47	2.0	20	0	97.3	74 - 124				
Trichloroethene	21.12	1.0	20	0.6711	102	79 - 123				
Vinyl chloride	22.26	1.0	20	0	111	58 - 137				
Surr: 1,2-Dichloroethane-d4	*49.58*	*1.0*	*50*	*0*	*99.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.75*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*46.27*	*1.0*	*50*	*0*	*92.5*	*80 - 119*				
Surr: Toluene-d8	*50.34*	*1.0*	*50*	*0*	*101*	*89 - 112*				

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041255

QC BATCH REPORT

Batch ID: R382419 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS21041306-17MSD** Units: **ug/L** Analysis Date: **26-Apr-2021 16:24**
Client ID: Run ID: **VOA6_382419** SeqNo: **6062403** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.3	1.0	20	0	91.5	80 - 119	18.26	0.251	20	
1,1-Dichloroethene	18.89	1.0	20	0	94.4	71 - 131	19.73	4.37	20	
1,2-Dichloroethane	18.32	1.0	20	0	91.6	73 - 128	18.42	0.511	20	
cis-1,2-Dichloroethene	17.6	1.0	20	0	88.0	78 - 123	18.83	6.7	20	
Methylene chloride	19.27	2.0	20	0	96.4	74 - 124	19.71	2.22	20	
Trichloroethene	18.73	1.0	20	0	93.6	79 - 123	19.73	5.23	20	
Vinyl chloride	20.99	1.0	20	0	105	58 - 137	21.68	3.21	20	
Surr: 1,2-Dichloroethane-d4	*48.13*	*1.0*	*50*	*0*	*96.3*	*81 - 118*	*48.61*	*0.988*	*20*	
Surr: 4-Bromofluorobenzene	*51.86*	*1.0*	*50*	*0*	*104*	*85 - 114*	*51.54*	*0.626*	*20*	
Surr: Dibromofluoromethane	*46.15*	*1.0*	*50*	*0*	*92.3*	*80 - 119*	*45.93*	*0.483*	*20*	
Surr: Toluene-d8	*50.76*	*1.0*	*50*	*0*	*102*	*89 - 112*	*51.67*	*1.77*	*20*	

MSD Sample ID: **HS21041306-09MSD** Units: **ug/L** Analysis Date: **26-Apr-2021 15:42**
Client ID: Run ID: **VOA6_382419** SeqNo: **6062401** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.57	1.0	20	0	92.8	80 - 119	18.86	1.54	20	
1,1-Dichloroethene	19.17	1.0	20	0	95.8	71 - 131	19.57	2.06	20	
1,2-Dichloroethane	19.21	1.0	20	0	96.1	73 - 128	19.87	3.39	20	
cis-1,2-Dichloroethene	18.69	1.0	20	0	93.4	78 - 123	19.05	1.91	20	
Methylene chloride	19.82	2.0	20	0	99.1	74 - 124	19.47	1.81	20	
Trichloroethene	19.98	1.0	20	0.6711	96.6	79 - 123	21.12	5.54	20	
Vinyl chloride	21.45	1.0	20	0	107	58 - 137	22.26	3.67	20	
Surr: 1,2-Dichloroethane-d4	*49.48*	*1.0*	*50*	*0*	*99.0*	*81 - 118*	*49.58*	*0.207*	*20*	
Surr: 4-Bromofluorobenzene	*50.9*	*1.0*	*50*	*0*	*102*	*85 - 114*	*50.75*	*0.285*	*20*	
Surr: Dibromofluoromethane	*46.58*	*1.0*	*50*	*0*	*93.2*	*80 - 119*	*46.27*	*0.668*	*20*	
Surr: Toluene-d8	*50.46*	*1.0*	*50*	*0*	*101*	*89 - 112*	*50.34*	*0.234*	*20*	

The following samples were analyzed in this batch: HS21041255-07 HS21041255-08

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041255

QC BATCH REPORT

Batch ID: 165053 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM2320B**

MBLK Sample ID: **MBLK-165053** Units: **mg/Kg** Analysis Date: **24-Apr-2021 14:53**
Client ID: Run ID: **ManTech01_382328** SeqNo: **6059935** PrepDate: **24-Apr-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	0	10.0								U
Alkalinity, Carbonate (As CaCO3)	0	10.0								U
Alkalinity, Hydroxide (As CaCO3)	0	10.0								U
Alkalinity, Total (As CaCO3)	0	10.0								U

LCS Sample ID: **LCS-165053** Units: **mg/Kg** Analysis Date: **24-Apr-2021 15:02**
Client ID: Run ID: **ManTech01_382328** SeqNo: **6059936** PrepDate: **24-Apr-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	10090	10.0	10000	0	101	80 - 120				
Alkalinity, Total (As CaCO3)	10300	10.0	10000	0	103	80 - 120				

LCSD Sample ID: **LCSD-165053** Units: **mg/Kg** Analysis Date: **24-Apr-2021 15:11**
Client ID: Run ID: **ManTech01_382328** SeqNo: **6059937** PrepDate: **24-Apr-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	10470	10.0	10000	0	105	80 - 120	10090	3.64	20	
Alkalinity, Total (As CaCO3)	10620	10.0	10000	0	106	80 - 120	10300	3.04	20	

DUP Sample ID: **HS21041255-08DUP** Units: **mg/Kg** Analysis Date: **24-Apr-2021 15:17**
Client ID: **16EW06-210422** Run ID: **ManTech01_382328** SeqNo: **6059939** PrepDate: **24-Apr-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	0	10.0					0	0	20	U
Alkalinity, Carbonate (As CaCO3)	0	10.0					0	0	20	U
Alkalinity, Hydroxide (As CaCO3)	0	10.0					0	0	20	U
Alkalinity, Total (As CaCO3)	0	10.0					0	0	20	U

The following samples were analyzed in this batch: HS21041255-08

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041255

QC BATCH REPORT

Batch ID: 165463 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-165463** Units: **mg/Kg** Analysis Date: **06-May-2021 09:45**
Client ID: Run ID: **ICS-Integrion_383145** SeqNo: **6079865** PrepDate: **05-May-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.00	1.00								U
Nitrogen, Nitrate (As N)	1.00	1.00								U
Sulfate	5.00	5.00								U

LCS Sample ID: **LCS-165463** Units: **mg/Kg** Analysis Date: **06-May-2021 09:52**
Client ID: Run ID: **ICS-Integrion_383145** SeqNo: **6079866** PrepDate: **05-May-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	37.62	1.00	40	0	94.0	80 - 120				
Nitrogen, Nitrate (As N)	36.13	1.00	40	0	90.3	80 - 120				
Sulfate	191	5.00	200	0	95.5	80 - 120				

MS Sample ID: **HS21041427-25MS** Units: **mg/Kg** Analysis Date: **06-May-2021 11:26**
Client ID: Run ID: **ICS-Integrion_383145** SeqNo: **6079875** PrepDate: **05-May-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	21.27	0.995	19.9	1.132	101	80 - 120				
Nitrogen, Nitrate (As N)	18.92	0.995	19.9	0.3726	93.2	80 - 120				
Sulfate	395	4.97	99.49	224.3	172	80 - 120				S

MSD Sample ID: **HS21041427-25MSD** Units: **mg/Kg** Analysis Date: **06-May-2021 11:34**
Client ID: Run ID: **ICS-Integrion_383145** SeqNo: **6079876** PrepDate: **05-May-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	21.29	0.998	19.97	1.132	101	80 - 120	21.27	0.109	20	
Nitrogen, Nitrate (As N)	19	0.998	19.97	0.3726	93.3	80 - 120	18.92	0.404	20	
Sulfate	379.9	4.99	99.84	224.3	156	80 - 120	395	3.92	20	S

The following samples were analyzed in this batch: HS21041255-08

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041255

QC BATCH REPORT

Batch ID: R382327 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM2320B**

MBLK Sample ID: **WBLKW1-210424** Units: **mg/L** Analysis Date: **24-Apr-2021 12:12**
Client ID: Run ID: **ManTech01_382327** SeqNo: **6059911** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **LCS1-210424** Units: **mg/L** Analysis Date: **24-Apr-2021 12:21**
Client ID: Run ID: **ManTech01_382327** SeqNo: **6059912** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1025	5.00	1000	0	103	85 - 115				

LCSD Sample ID: **LCSD1-210424** Units: **mg/L** Analysis Date: **24-Apr-2021 12:29**
Client ID: Run ID: **ManTech01_382327** SeqNo: **6059913** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1033	5.00	1000	0	103	85 - 115	1025	0.769	20	

DUP Sample ID: **HS21041257-01DUP** Units: **mg/L** Analysis Date: **24-Apr-2021 12:43**
Client ID: Run ID: **ManTech01_382327** SeqNo: **6059915** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	280.8	5.00					297.6	5.84	20	

The following samples were analyzed in this batch: HS21041255-05 HS21041255-07

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041255

QC BATCH REPORT

Batch ID: R382366 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **23-Apr-2021 11:10**
Client ID: Run ID: **ICS-Integrion_382366** SeqNo: **6060702** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **23-Apr-2021 11:29**
Client ID: Run ID: **ICS-Integrion_382366** SeqNo: **6060703** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.564	0.100	4	0	89.1	80 - 120				
Nitrogen, Nitrate (As N)	3.727	0.100	4	0	93.2	80 - 120				
Sulfate	18.79	0.500	20	0	94.0	80 - 120				

MS Sample ID: **HS21041056-02MS** Units: **mg/L** Analysis Date: **23-Apr-2021 20:52**
Client ID: Run ID: **ICS-Integrion_382366** SeqNo: **6060726** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	44.75	2.00	40	8.074	91.7	80 - 120				
Nitrogen, Nitrate (As N)	39.93	2.00	40	0	99.8	80 - 120				
Sulfate	197.3	10.0	200	8.808	94.2	80 - 120				

MS Sample ID: **HS21041055-01MS** Units: **mg/L** Analysis Date: **23-Apr-2021 18:25**
Client ID: Run ID: **ICS-Integrion_382366** SeqNo: **6060719** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.181	0.100	2	0.3425	91.9	80 - 120				
Nitrogen, Nitrate (As N)	1.956	0.100	2	0	97.8	80 - 120				
Sulfate	10.02	0.500	10	0.1333	98.9	80 - 120				

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041255

QC BATCH REPORT

Batch ID: R382366 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MS Sample ID: **HS21040612-03MS** Units: **mg/L** Analysis Date: **23-Apr-2021 14:44**
Client ID: Run ID: **ICS-Integrion_382366** SeqNo: **6060708** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	37.97	1.00	20	19.22	93.8	80 - 120				
Nitrogen, Nitrate (As N)	20.37	1.00	20	0	102	80 - 120				
Sulfate	331.3	5.00	100	251.6	79.7	80 - 120				S

MSD Sample ID: **HS21041056-02MSD** Units: **mg/L** Analysis Date: **23-Apr-2021 21:10**
Client ID: Run ID: **ICS-Integrion_382366** SeqNo: **6060727** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	45.03	2.00	40	8.074	92.4	80 - 120	44.75	0.628	20	
Nitrogen, Nitrate (As N)	40.29	2.00	40	0	101	80 - 120	39.93	0.907	20	
Sulfate	200.8	10.0	200	8.808	96.0	80 - 120	197.3	1.74	20	

MSD Sample ID: **HS21041055-01MSD** Units: **mg/L** Analysis Date: **23-Apr-2021 18:43**
Client ID: Run ID: **ICS-Integrion_382366** SeqNo: **6060720** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.186	0.100	2	0.3425	92.2	80 - 120	2.181	0.192	20	
Nitrogen, Nitrate (As N)	1.973	0.100	2	0	98.6	80 - 120	1.956	0.835	20	
Sulfate	10.23	0.500	10	0.1333	101	80 - 120	10.02	2.08	20	

MSD Sample ID: **HS21040612-03MSD** Units: **mg/L** Analysis Date: **23-Apr-2021 15:57**
Client ID: Run ID: **ICS-Integrion_382366** SeqNo: **6060711** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	38.61	1.00	20	19.22	97.0	80 - 120	37.97	1.66	20	
Nitrogen, Nitrate (As N)	20.35	1.00	20	0	102	80 - 120	20.37	0.0786	20	
Sulfate	329.2	5.00	100	251.6	77.6	80 - 120	331.3	0.646	20	S

The following samples were analyzed in this batch: HS21041255-05 HS21041255-07

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041255

QC BATCH REPORT

Batch ID: R382840 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **01-May-2021 08:23**
Client ID: Run ID: **ICS-Integrion_382840** SeqNo: **6071997** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **01-May-2021 08:41**
Client ID: Run ID: **ICS-Integrion_382840** SeqNo: **6071998** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	19.12	0.500	20	0	95.6	80 - 120				

MS Sample ID: **HS21041595-02MS** Units: **mg/L** Analysis Date: **30-Apr-2021 13:47**
Client ID: Run ID: **ICS-Integrion_382840** SeqNo: **6072007** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	294.5	0.500	10	285	95.1	80 - 120				EO

MSD Sample ID: **HS21041595-02MSD** Units: **mg/L** Analysis Date: **30-Apr-2021 14:06**
Client ID: Run ID: **ICS-Integrion_382840** SeqNo: **6072033** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	298.2	0.500	10	285	132	80 - 120	294.5	1.25	20	SEO

The following samples were analyzed in this batch: HS21041255-07

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041255

QC BATCH REPORT

Batch ID: R382918 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **MBLK2-05032021** Units: **mg/L** Analysis Date: **03-May-2021 21:12**
Client ID: Run ID: **TOC_04_382918** SeqNo: **6073968** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	0.500	1.00								U

LCS Sample ID: **LCS2-05032021** Units: **mg/L** Analysis Date: **03-May-2021 21:28**
Client ID: Run ID: **TOC_04_382918** SeqNo: **6073969** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.48	1.00	10	0	105	85 - 115				

LCSD Sample ID: **LCSD2-05032021** Units: **mg/L** Analysis Date: **03-May-2021 21:43**
Client ID: Run ID: **TOC_04_382918** SeqNo: **6073970** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.43	1.00	10	0	104	85 - 115	10.48	0.478	20	

MS Sample ID: **HS21041275-03MS** Units: **mg/L** Analysis Date: **03-May-2021 23:15**
Client ID: Run ID: **TOC_04_382918** SeqNo: **6073976** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	20.34	1.00	10	15.54	48.0	80 - 120				S

The following samples were analyzed in this batch: HS21041255-07

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: HS21041255

QC BATCH REPORT

Batch ID: R383003 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **MBLK2-05042021** Units: **mg/L** Analysis Date: **04-May-2021 21:49**
Client ID: Run ID: **TOC_04_383003** SeqNo: **6075979** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	0.500	1.00								U

LCS Sample ID: **LCS2-05042021** Units: **mg/L** Analysis Date: **04-May-2021 22:04**
Client ID: Run ID: **TOC_04_383003** SeqNo: **6075980** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.752	1.00	10	0	97.5	85 - 115				

LCSD Sample ID: **LCSD2-05042021** Units: **mg/L** Analysis Date: **04-May-2021 22:19**
Client ID: Run ID: **TOC_04_383003** SeqNo: **6075981** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.61	1.00	10	0	96.1	85 - 115	9.752	1.47	20	

MS Sample ID: **HS21041585-02MS** Units: **mg/L** Analysis Date: **04-May-2021 23:04**
Client ID: Run ID: **TOC_04_383003** SeqNo: **6075984** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	18.88	1.00	10	8.11	108	80 - 120				

The following samples were analyzed in this batch: HS21041255-05

ALS Houston, US Date: 10-May-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 April 2021
WorkOrder: **HS21041255**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
Date	
mg/Kg-dry	Milligrams per Kilogram- Dry weight corrected
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	21-022-0	26-Mar-2022
Dept of Defense	PJLA L20-507-R2	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2021-2022	30-Apr-2022
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2021	31-Dec-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-21-27	30-Apr-2022

ALS Houston, US Date: 10-May-21

Sample Receipt Checklist

Work Order ID: HS21041255 **Date/Time Received:** **23-Apr-2021 10:15**

Client Name: CBI-Houston **Received by:** **Paresh M. Giga**

Completed By: */S/ Paresh M. Giga* (eSignature) 23-Apr-2021 12:08 (Date/Time) **Reviewed by:** */S/ RJ Modashia* (eSignature) 23-Apr-2021 14:58 (Date/Time)

Matrices: **GW/Water** Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:none
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	0.9C U/C	IR31	
Cooler(s)/Kit(s):	46876		
Date/Time sample(s) sent to storage:	4/23/2021 12:25		
Water - VOA vials have zero headspace?	Yes ☐	No ☑	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes: Headspace >6mm. Sample 16IW09-210422
VOC - 2 vials; TPH - 2 vials

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

HS21041255

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant 16 April 2021

Project: APTIM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 16 April 2021**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. / Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16WW27-210422	WG	4/22/21/0740		4	X					X					
16WW43-210422	WG	4/22/21/0820		4	X					X					
16WW23-210422	WG	4/22/21/0905		4	X					X					
16WW24-210422	WG	4/22/21/0945		4	X					X					
16IW09-210422	WG	4/22/21/1030		10	X	X	X	X	X	X					
16WW49-210422	WG	4/22/21/1120		4	X					X					
16WW48-210422	WG	4/22/21/1205		10	X	X	X	X	X	X					
16EW06-210422	WG	4/22/21/1255		10	X	X	X	X	X	X					

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	4/22/21	1430		4/23/2021	10:15						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

46876 0.9° #31 cr(-0.1°

(Word) S:\1-ccs\Forms\Chain of Custody - BiWeekly

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Page 1 of 1

Project: APTIM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 16 April 2021**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservati etc.)
Trip Blank-210422	W	4/22/21		2	X										

Analyses

Aptim Environmental & Infrastructure, Inc.
Longhorn Army Ammunition Plant 16 April 2021

HS21041255

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	4/22/21	1430		4/23/2021	10:15						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

46876

CUSTODY SEAL

Date: 4/22/21 Time: 1430
Name: Scott Beesinger
Company: Bluefin

Seal Broken By:
Date: 04/23/21

46876 APR 2 3 2021

Must Deliver Next Business Day
Time and Tempature Sensitive!

46876

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFRASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 29MAR21
ACTWGT: 1.00 LB MAN
CAD: 0221247/CAFE3409
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-BQ 77443-RJ

RMA:

FedEx Express

FedEx
TRK# 0221 9473 0841 7362

FRI - 23 APR AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FID: 5890797 27Apr2021 GGGA 560G3/F9A6/1023

May 10, 2021 Service Request No:E2100529

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: HS21041255

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory April 26, 2021
For your reference, these analyses have been assigned our service request number **E2100529.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100529
Project:	HS21041255	**Date Received:**	04/26/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Eight samples were received for analysis at ALS Environmental in Houston on 04/26/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100263 & EQ2100278: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for these extraction batches. The LCS and DLCS recoveries are within QC limits.

DoD certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2100529
Project: HS21041255

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100529-001	16WW27-210422	4/22/2021	0740
E2100529-002	16WW43-210422	4/22/2021	0820
E2100529-003	16WW23-210422	4/22/2021	0905
E2100529-004	16WW24-210422	4/22/2021	0945
E2100529-005	16IW09-210422	4/22/2021	1030
E2100529-006	16WW49-210422	4/22/2021	1120
E2100529-007	16WW48-210422	4/22/2021	1205
E2100529-008	16EW06-210422	4/22/2021	1255

Service Request Summary

Folder #: **E2100529**
Client Name: ALS Environmental - US
Project Name: HS21041255
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 04/26/21
Internal Due Date: 5/7/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21041255
EDD: No EDD Specified

8 125 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: SMO
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100529-001	16WW27-210422	Ground Water	04/22/21 0740	**IV**
E2100529-002	16WW43-210422	Ground Water	04/22/21 0820	**IV**
E2100529-003	16WW23-210422	Ground Water	04/22/21 0905	**IV**
E2100529-004	16WW24-210422	Ground Water	04/22/21 0945	**IV**
E2100529-005	16IW09-210422	Ground Water	04/22/21 1030	**IV**
E2100529-006	16WW49-210422	Ground Water	04/22/21 1120	**IV**
E2100529-007	16WW48-210422	Ground Water	04/22/21 1205	**IV**
E2100529-008	16EW06-210422	Liquid	04/22/21 1255	**IV**

Service Request Summary

Folder #: **E2100529**
Client Name: ALS Environmental - US
Project Name: HS21041255
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 04/26/21
Internal Due Date: 5/7/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21041255
EDD: No EDD Specified

8 125 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: SMO
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	8	IV due 5/14 - Labeled as E2100469

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	21-022-0	3/26/2022
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2021-2022	4/30/2022
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Louisiana Department of Health and Hospitals	LA028-2021	12/31/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Minnesota Department of Health	2021671	12/31/2021
Nevada Department of Concervation and Natural Resources	TX026932021-4	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209421	4/24/2022
New Jersey Department of Environmental Protection	TX008	6/30/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2021	4/30/2022
United States Department of Agriculture	P330-19-00299	10/10/2022

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15979**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS21041255
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21041255-01**	**16WW27-210422**	**Groundwater**	**22 Apr 2021 07:40**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			07 May 2021
2.	**HS21041255-02**	**16WW43-210422**	**Groundwater**	**22 Apr 2021 08:20**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			07 May 2021
3.	**HS21041255-03**	**16WW23-210422**	**Groundwater**	**22 Apr 2021 09:05**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			07 May 2021
4.	**HS21041255-04**	**16WW24-210422**	**Groundwater**	**22 Apr 2021 09:45**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			07 May 2021
5.	**HS21041255-05**	**16IW09-210422**	**Groundwater**	**22 Apr 2021 10:30**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			07 May 2021
6.	**HS21041255-06**	**16WW49-210422**	**Groundwater**	**22 Apr 2021 11:20**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			07 May 2021
7.	**HS21041255-07**	**16WW48-210422**	**Groundwater**	**22 Apr 2021 12:05**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			07 May 2021
8.	**HS21041255-08**	**16EW06-210422**	**Groundwater**	**22 Apr 2021 12:55**

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15979**

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			07 May 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: _____

Received By: _____ Date/Time: 4/26/21 0800

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

Cooler Receipt Form

Project Chemist _____

Client/Project _____ Thermometer ID _____

Date/Time Received: _____ Initials: _____ Date/Time Logged in: _____ Initials _____

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ Courier ○ Client

2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other _____

3. Were custody seals on coolers? ○ Yes ✓ No If yes, how many and where? _____

Were they intact? ○ Yes ○ No ✓ N/A

Were they signed and dated? ○ Yes ○ No ✓ N/A

4. Packing Material: ○ Inserts ✓ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other _____

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling: _____

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA						☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No

7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No

8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No

9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No

10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

ALS Environmental - Houston HRMS

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www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 378427 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 4/30/21 12:06

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100470-001	16WW40-210421	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2100470-002	16WW12-210421	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2100492-001	HBW7_042721	.01	6850/ClO4 DOD			Surface Water	10mL	
4	E2100492-002	HBW10_042721	.01	6850/ClO4 DOD			Surface Water	10mL	
5	E2100492-003	HBW10_042721_a	.01	6850/ClO4 DOD			Surface Water	10mL	
6	E2100492-004	HBW1_042721	.01	6850/ClO4 DOD			Surface Water	10mL	
7	E2100492-005	GPW1_042721	.01	6850/ClO4 DOD			Surface Water	10mL	
8	E2100492-006	GPW3_042721	.01	6850/ClO4 DOD			Surface Water	10mL	
9	E2100493-001	LH18/24-SP650_042721_BIX	.01	6850/ClO4 DOD			Surface Water	10mL	
10	E2100529-001	16WW27-210422	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2100529-002	16WW43-210422	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2100529-003	16WW23-210422	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2100529-004	16WW24-210422	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2100529-005	16IW09-210422	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2100529-006	16WW49-210422	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2100529-007	16WW48-210422	.01	6850/ClO4 DOD			Ground Water	10mL	
17	EQ2100263-01	MB		6850/ClO4 DOD			Liquid	10mL	
18	EQ2100263-02	LCS		6850/ClO4 DOD			Liquid	10mL	
19	EQ2100263-03	DLCS		6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100263-02 1.00µL EQ2100263-03 1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100470-001	100.00µL	E2100470-002	100.00µL	E2100492-001	100.00µL	E2100492-002	100.00µL	E2100492-003	100.00µL	E2100492-004	100.00µL
E2100492-005	100.00µL	E2100492-006	100.00µL	E2100493-001	100.00µL	E2100529-001	100.00µL	E2100529-002	100.00µL	E2100529-003	100.00µL
E2100529-004	100.00µL	E2100529-005	100.00µL	E2100529-006	100.00µL	E2100529-007	100.00µL	EQ2100263-01	100.00µL	EQ2100263-02	100.00µL
EQ2100263-03	100.00µL										

Preparation Information Benchsheet

Prep Run#: 378427
Team: Semivoa GCMS/GRIVERA

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 4/30/21 12:06

Preparation Steps

Step: Preparation
Started: 4/30/21 12:06
Finished: 4/30/21 14:30
By: KBROWN
Comments

Comments: _____

Reviewed By: KB Date: 4/30/21

Chain of Custody

Relinquished By: _____ Date: _____

Received By: _____ Date: _____

Extracts Examined
Yes No

Preparation Information Benchsheet

Prep Run#: 378968 **Prep WorkFlow:** Gen CLO4 **Status:** Prepped
Team: Semivoa GCMS/KBROWN **Prep Method:** **Prep Date/Time:** 5/10/21 10:00

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100529-008	16EW06-210422	.01	6850/ClO4 DOD			Liquid	1.190g	
2	EQ2100278-01	MB		6850/ClO4 DOD			Solid	1.00g	
3	EQ2100278-02	LCS		6850/ClO4 DOD			Solid	1.00g	
4	EQ2100278-03	DLCS		6850/ClO4 DOD			Solid	1.00g	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100278-02 1.00µL EQ2100278-03 1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100529-008 100.00µL EQ2100278-01 100.00µL EQ2100278-02 100.00µL EQ2100278-03 100.00µL

Preparation Steps

Step: Extraction
Started: 5/10/21 10:00
Finished: 5/10/21 10:30
By: KBROWN
Comments

Comments: _____

Reviewed By: KB Date: 5/10/21

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined

Received By: _____ Date: _____ Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100529
Project:	HS21041255	**Date Collected:**	4/22/21 0740
Sample Matrix:	Ground Water	**Date Received:**	4/26/21
Sample Name:	16WW27-210422	**Units:**	µg/L
Lab Code:	E2100529-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/30/21	5/1/21 16:50	378427	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100529
Project:	HS21041255	**Date Collected:**	4/22/21 0820
Sample Matrix:	Ground Water	**Date Received:**	4/26/21
Sample Name:	16WW43-210422	**Units:**	µg/L
Lab Code:	E2100529-002	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.500	0.250	0.125	5	4/30/21	5/3/21 10:23	378427	722497	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100529
Project:	HS21041255	**Date Collected:**	4/22/21 0905
Sample Matrix:	Ground Water	**Date Received:**	4/26/21
Sample Name:	16WW23-210422	**Units:**	µg/L
Lab Code:	E2100529-003	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/30/21	5/1/21 17:09	378427	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100529
Project:	HS21041255	**Date Collected:**	4/22/21 0945
Sample Matrix:	Ground Water	**Date Received:**	4/26/21
Sample Name:	16WW24-210422	**Units:**	µg/L
Lab Code:	E2100529-004	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/30/21	5/1/21 17:18	378427	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100529
Project:	HS21041255	**Date Collected:**	4/22/21 1030
Sample Matrix:	Ground Water	**Date Received:**	4/26/21
Sample Name:	16IW09-210422	**Units:**	µg/L
Lab Code:	E2100529-005	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/30/21	5/1/21 17:27	378427	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100529
Project:	HS21041255	**Date Collected:**	4/22/21 1120
Sample Matrix:	Ground Water	**Date Received:**	4/26/21
Sample Name:	16WW49-210422	**Units:**	µg/L
Lab Code:	E2100529-006	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/30/21	5/1/21 17:37	378427	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100529
Project:	HS21041255	**Date Collected:**	4/22/21 1205
Sample Matrix:	Ground Water	**Date Received:**	4/26/21
Sample Name:	16WW48-210422	**Units:**	µg/L
Lab Code:	E2100529-007	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**94.7**		1.00	0.500	0.250	10	4/30/21	5/3/21 10:32	378427	722497	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100529
Project:	HS21041255	**Date Collected:**	4/22/21 1255
Sample Matrix:	Liquid	**Date Received:**	4/26/21
Sample Name:	16EW06-210422	**Units:**	µg/Kg
Lab Code:	E2100529-008	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	8.40	7.50	3.00	10	5/10/21	5/10/21 13:32	378968	722771	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100529
Project:	HS21041255	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100263-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/30/21	5/1/21 16:22	378427	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100529
Project:	HS21041255	**Date Collected:**	NA
Sample Matrix:	Liquid	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/Kg
Lab Code:	EQ2100278-01	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.750	0.300	1	5/10/21	5/10/21 12:11	378968	722771	

Accuracy & Precision

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ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21041255
Sample Matrix: Liquid

Service Request: E2100529
Date Analyzed: 5/10/21

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method:

Units: µg/Kg
Basis: As Received

Extraction Lot: 378968

	Lab Control Sample EQ2100278-02			Duplicate Lab Control Sample EQ2100278-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	1.17	1.00	117	1.11	1.00	111	84 - 121	5	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100529
Project:	HS21041255	**Date Collected:**	NA
Sample Matrix:	Liquid	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/Kg
Lab Code:	EQ2100278-02	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**1.17**		1.00	0.750	0.300	1	5/10/21	5/10/21 12:49	378968	722771	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100529
Project:	HS21041255	**Date Collected:**	NA
Sample Matrix:	Liquid	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/Kg
Lab Code:	EQ2100278-03	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**1.11**		1.00	0.750	0.300	1	5/10/21	5/10/21 12:58	378968	722771	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21041255
Sample Matrix: Ground Water

Service Request: E2100529
Date Analyzed: 5/ 1/21

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Units: µg/L
Basis: NA

Extraction Lot: 378427

	Lab Control Sample EQ2100263-02			Duplicate Lab Control Sample EQ2100263-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0981	0.100	98	0.112	0.100	112	84 - 119	13	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100529
Project:	HS21041255	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100263-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0981**	J	0.100	0.0500	0.0250	1	4/30/21	5/1/21 16:31	378427	722220	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100529
Project:	HS21041255	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100263-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.112**		0.100	0.0500	0.0250	1	4/30/21	5/1/21 16:40	378427	722220	

10515 Research Drive
Knoxville, TN 37932
Phone: (865) 573-8188
Fax: (865) 573-8133

Client:	Vicki Graves APTIM 2410 Cherahala Blvd Knoxville, TN 37932 US	**Phone:**	865-560-7818 **Fax:**

Identifier: 050SG **Date Rec:** 07/14/2021 **Report Date:** 07/27/2021

Client Project #: 501032 **Client Project Name:** LHAAP 16 July 2021

Purchase Order #: 204818

Test results provided for: CENSUS

Reviewed By:



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Results relate only to the items tested and the sample(s) as received by the laboratory.

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **APTIM**
Project: LHAAP 16 July 2021

MI Project Number: **050SG**
Date Received: 07/14/2021

Sample Information

Client Sample ID:		**16WW25-210713**	**16WW26-210713**	**16WW55-210713**	**16WW48-210713**	**16WW58-210714**
Sample Date:		07/13/2021	07/13/2021	07/13/2021	07/13/2021	07/14/2021
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		HT/CB	HT/CB	HT/CB	HT/CB	HT/CB
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**5.30E+00**	**5.40E+00**	**3.00E-01 (J)**	**4.60E+00**	**6.90E+00**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **APTIM**
Project: LHAAP 16 July 2021

MI Project Number: **050SG**
Date Received: 07/14/2021

Sample Information

Client Sample ID:		**16WW57-210714**	**16WW35-210714**	**16WW36-210714**	**16WW16-210720**	**16WW56-210720**
Sample Date:		07/14/2021	07/14/2021	07/14/2021	07/20/2021	07/20/2021
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		HT/CB	HT/CB	HT/CB	HT/CB	HT/CB
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**4.70E+00**	**2.11E+01**	**1.20E+03**	**5.00E-01 (J)**	**2.86E+01**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **APTIM**
Project: LHAAP 16 July 2021

MI Project Number: **050SG**
Date Received: 07/14/2021

Sample Information

Client Sample ID:		**16WW22-210720**	**16WW41-210720**	**16WW29-210720**
Sample Date:		07/20/2021	07/20/2021	07/20/2021
Units:		cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		HT/CB	HT/CB	HT/CB
Dechlorinating Bacteria				
Dehalococcoides	*DHC*	**2.49E+01**	**4.00E-01 (J)**	**2.51E+01**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

Quality Assurance/Quality Control Data

Samples Received **7/14/2021**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	07/14/2021	07/27/2021	0 °C	101%	non-detect	non-detect

Samples Received **7/15/2021**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	07/15/2021	07/27/2021	0 °C	99%	non-detect	non-detect

Samples Received **7/21/2021**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	07/21/2021	07/27/2021	0 °C	100%	non-detect	non-detect

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

July 27, 2021

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
10333 Richmond Ave
Ste 1030
Houston, TX 77042

Work Order: **HS21070616**

Laboratory Results for: **Longhorn Army Ammunition Plant LHAAP 16 July 2021**

Dear Vicki Graves ,

ALS Environmental received 10 sample(s) on Jul 13, 2021 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Ragen Giga
Project Manager

ALS Houston, US Date: 27-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21070616

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21070616-01	16WW44-210712	GW		12-Jul-2021 07:35	13-Jul-2021 09:20	☐
HS21070616-02	16WW37-210712	GW		12-Jul-2021 08:20	13-Jul-2021 09:20	☐
HS21070616-03	16WW38-210712	GW		12-Jul-2021 09:00	13-Jul-2021 09:20	☐
HS21070616-04	16WW14-210712	GW		12-Jul-2021 09:40	13-Jul-2021 09:20	☐
HS21070616-05	16WW34-210712	GW		12-Jul-2021 10:25	13-Jul-2021 09:20	☐
HS21070616-06	16WW34-210712-FD	GW		12-Jul-2021 10:25	13-Jul-2021 09:20	☐
HS21070616-07	16WW33-210712	GW		12-Jul-2021 11:15	13-Jul-2021 09:20	☐
HS21070616-08	16WW32-210712	GW		12-Jul-2021 12:05	13-Jul-2021 09:20	☐
HS21070616-09	16WW31-210712	GW		12-Jul-2021 12:55	13-Jul-2021 09:20	☐
HS21070616-10	Trip Blank-210712	Water	CG-061121-127	12-Jul-2021 00:00	13-Jul-2021 09:20	☐

ALS Houston, US Date: 27-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21070616

CASE NARRATIVE

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston Specialty Lab. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R387642

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 27-Jul-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**

Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070616

Sample ID: 16WW44-210712 Lab ID:HS21070616-01

Collection Date: 12-Jul-2021 07:35 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	16-Jul-2021 15:20
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 15:20
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 15:20
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 15:20
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	16-Jul-2021 15:20
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 15:20
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 15:20
Surr: 1,2-Dichloroethane-d4	*91.7*			**0**	*81-118*	*%REC*	*1*	*16-Jul-2021 15:20*
Surr: 4-Bromofluorobenzene	*94.7*			**0**	*85-114*	*%REC*	*1*	*16-Jul-2021 15:20*
Surr: Dibromofluoromethane	*96.9*			**0**	*80-119*	*%REC*	*1*	*16-Jul-2021 15:20*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*16-Jul-2021 15:20*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Jul-2021 17:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 27-Jul-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070616
Sample ID: 16WW37-210712 Lab ID:HS21070616-02
Collection Date: 12-Jul-2021 08:20 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	16-Jul-2021 15:41
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 15:41
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 15:41
cis-1,2-Dichloroethene	**5.4**		**0.20**	**0.50**	**1.0**	**ug/L**	1	16-Jul-2021 15:41
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	16-Jul-2021 15:41
Trichloroethene	**89**		**0.20**	**0.50**	**1.0**	**ug/L**	1	16-Jul-2021 15:41
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 15:41
Surr: 1,2-Dichloroethane-d4	*89.4*			**0**	*81-118*	*%REC*	*1*	*16-Jul-2021 15:41*
Surr: 4-Bromofluorobenzene	*90.5*			**0**	*85-114*	*%REC*	*1*	*16-Jul-2021 15:41*
Surr: Dibromofluoromethane	*96.7*			**0**	*80-119*	*%REC*	*1*	*16-Jul-2021 15:41*
Surr: Toluene-d8	*94.7*			**0**	*89-112*	*%REC*	*1*	*16-Jul-2021 15:41*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Jul-2021 17:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 27-Jul-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070616
Sample ID: 16WW38-210712 Lab ID:HS21070616-03
Collection Date: 12-Jul-2021 09:00 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	16-Jul-2021 16:02
1,1-Dichloroethene	**14**		**1.0**	**2.5**	**5.0**	**ug/L**	5	16-Jul-2021 16:02
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	ug/L	5	16-Jul-2021 16:02
cis-1,2-Dichloroethene	**1,000**		**10**	**25**	**50**	**ug/L**	50	16-Jul-2021 17:05
Methylene chloride	5.0	U	2.0	5.0	10	ug/L	5	16-Jul-2021 16:02
Trichloroethene	**2,000**		**10**	**25**	**50**	**ug/L**	50	16-Jul-2021 17:05
Vinyl chloride	**37**		**1.0**	**2.5**	**5.0**	**ug/L**	5	16-Jul-2021 16:02
Surr: 1,2-Dichloroethane-d4	*107*			**0**	*81-118*	*%REC*	*50*	*16-Jul-2021 17:05*
Surr: 1,2-Dichloroethane-d4	*111*			**0**	*81-118*	*%REC*	*5*	*16-Jul-2021 16:02*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*5*	*16-Jul-2021 16:02*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*50*	*16-Jul-2021 17:05*
Surr: Dibromofluoromethane	*109*			**0**	*80-119*	*%REC*	*50*	*16-Jul-2021 17:05*
Surr: Dibromofluoromethane	*110*			**0**	*80-119*	*%REC*	*5*	*16-Jul-2021 16:02*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*5*	*16-Jul-2021 16:02*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*50*	*16-Jul-2021 17:05*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Jul-2021 17:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 27-Jul-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070616
Sample ID: 16WW14-210712 Lab ID:HS21070616-04
Collection Date: 12-Jul-2021 09:40 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	16-Jul-2021 18:08
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 18:08
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 18:08
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 18:08
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	16-Jul-2021 18:08
Trichloroethene	**8.4**		**0.20**	**0.50**	**1.0**	**ug/L**	1	16-Jul-2021 18:08
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 18:08
Surr: 1,2-Dichloroethane-d4	*109*			**0**	*81-118*	*%REC*	*1*	*16-Jul-2021 18:08*
Surr: 4-Bromofluorobenzene	*96.9*			**0**	*85-114*	*%REC*	*1*	*16-Jul-2021 18:08*
Surr: Dibromofluoromethane	*107*			**0**	*80-119*	*%REC*	*1*	*16-Jul-2021 18:08*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*16-Jul-2021 18:08*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Jul-2021 17:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 27-Jul-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**

Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070616

Sample ID: 16WW34-210712 Lab ID:HS21070616-05

Collection Date: 12-Jul-2021 10:25 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	16-Jul-2021 18:29
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 18:29
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 18:29
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 18:29
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	16-Jul-2021 18:29
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 18:29
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 18:29
Surr: 1,2-Dichloroethane-d4	*110*			**0**	*81-118*	*%REC*	*1*	*16-Jul-2021 18:29*
Surr: 4-Bromofluorobenzene	*100.0*			**0**	*85-114*	*%REC*	*1*	*16-Jul-2021 18:29*
Surr: Dibromofluoromethane	*109*			**0**	*80-119*	*%REC*	*1*	*16-Jul-2021 18:29*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*16-Jul-2021 18:29*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Jul-2021 17:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 27-Jul-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**

Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070616

Sample ID: 16WW34-210712-FD Lab ID:HS21070616-06

Collection Date: 12-Jul-2021 10:25 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	16-Jul-2021 18:50
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 18:50
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 18:50
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 18:50
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	16-Jul-2021 18:50
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 18:50
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 18:50
Surr: 1,2-Dichloroethane-d4	*107*			**0**	*81-118*	*%REC*	*1*	*16-Jul-2021 18:50*
Surr: 4-Bromofluorobenzene	*97.1*			**0**	*85-114*	*%REC*	*1*	*16-Jul-2021 18:50*
Surr: Dibromofluoromethane	*107*			**0**	*80-119*	*%REC*	*1*	*16-Jul-2021 18:50*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*16-Jul-2021 18:50*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Jul-2021 17:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 27-Jul-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070616
Sample ID: 16WW33-210712 Lab ID:HS21070616-07
Collection Date: 12-Jul-2021 11:15 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	16-Jul-2021 19:11
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 19:11
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 19:11
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 19:11
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	16-Jul-2021 19:11
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 19:11
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 19:11
Surr: 1,2-Dichloroethane-d4	*107*			**0**	*81-118*	*%REC*	*1*	*16-Jul-2021 19:11*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*16-Jul-2021 19:11*
Surr: Dibromofluoromethane	*107*			**0**	*80-119*	*%REC*	*1*	*16-Jul-2021 19:11*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*16-Jul-2021 19:11*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Jul-2021 17:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 27-Jul-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070616
Sample ID: 16WW32-210712 Lab ID:HS21070616-08
Collection Date: 12-Jul-2021 12:05 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	16-Jul-2021 19:33
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 19:33
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 19:33
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 19:33
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	16-Jul-2021 19:33
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 19:33
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 19:33
Surr: 1,2-Dichloroethane-d4	*107*			**0**	*81-118*	*%REC*	*1*	*16-Jul-2021 19:33*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*16-Jul-2021 19:33*
Surr: Dibromofluoromethane	*107*			**0**	*80-119*	*%REC*	*1*	*16-Jul-2021 19:33*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*16-Jul-2021 19:33*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Jul-2021 17:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 27-Jul-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070616
Sample ID: 16WW31-210712 Lab ID:HS21070616-09
Collection Date: 12-Jul-2021 12:55 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	16-Jul-2021 19:54
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 19:54
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 19:54
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 19:54
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	16-Jul-2021 19:54
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 19:54
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 19:54
Surr: 1,2-Dichloroethane-d4	*110*			**0**	*81-118*	*%REC*	*1*	*16-Jul-2021 19:54*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*16-Jul-2021 19:54*
Surr: Dibromofluoromethane	*109*			**0**	*80-119*	*%REC*	*1*	*16-Jul-2021 19:54*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*16-Jul-2021 19:54*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Jul-2021 17:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 27-Jul-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070616
Sample ID: Trip Blank-210712 Lab ID:HS21070616-10
Collection Date: 12-Jul-2021 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	16-Jul-2021 17:47
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 17:47
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 17:47
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 17:47
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	16-Jul-2021 17:47
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 17:47
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Jul-2021 17:47
Surr: 1,2-Dichloroethane-d4	*109*			**0**	*81-118*	*%REC*	*1*	*16-Jul-2021 17:47*
Surr: 4-Bromofluorobenzene	*99.6*			**0**	*85-114*	*%REC*	*1*	*16-Jul-2021 17:47*
Surr: Dibromofluoromethane	*111*			**0**	*80-119*	*%REC*	*1*	*16-Jul-2021 17:47*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*16-Jul-2021 17:47*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 27-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070616

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R387642 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21070616-10	Trip Blank-210712	12 Jul 2021 00:00			16 Jul 2021 17:47	1
Batch ID: R387642 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** GW	
HS21070616-01	16WW44-210712	12 Jul 2021 07:35			16 Jul 2021 15:20	1
HS21070616-02	16WW37-210712	12 Jul 2021 08:20			16 Jul 2021 15:41	1
HS21070616-03	16WW38-210712	12 Jul 2021 09:00			16 Jul 2021 17:05	50
HS21070616-03	16WW38-210712	12 Jul 2021 09:00			16 Jul 2021 16:02	5
HS21070616-04	16WW14-210712	12 Jul 2021 09:40			16 Jul 2021 18:08	1
HS21070616-05	16WW34-210712	12 Jul 2021 10:25			16 Jul 2021 18:29	1
HS21070616-06	16WW34-210712-FD	12 Jul 2021 10:25			16 Jul 2021 18:50	1
HS21070616-07	16WW33-210712	12 Jul 2021 11:15			16 Jul 2021 19:11	1
HS21070616-08	16WW32-210712	12 Jul 2021 12:05			16 Jul 2021 19:33	1
HS21070616-09	16WW31-210712	12 Jul 2021 12:55			16 Jul 2021 19:54	1
Batch ID: R388329 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** GW	
HS21070616-01	16WW44-210712	12 Jul 2021 07:35			27 Jul 2021 17:30	1
HS21070616-02	16WW37-210712	12 Jul 2021 08:20			27 Jul 2021 17:30	1
HS21070616-03	16WW38-210712	12 Jul 2021 09:00			27 Jul 2021 17:30	1
HS21070616-04	16WW14-210712	12 Jul 2021 09:40			27 Jul 2021 17:30	1
HS21070616-05	16WW34-210712	12 Jul 2021 10:25			27 Jul 2021 17:30	1
HS21070616-06	16WW34-210712-FD	12 Jul 2021 10:25			27 Jul 2021 17:30	1
HS21070616-07	16WW33-210712	12 Jul 2021 11:15			27 Jul 2021 17:30	1
HS21070616-08	16WW32-210712	12 Jul 2021 12:05			27 Jul 2021 17:30	1
HS21070616-09	16WW31-210712	12 Jul 2021 12:55			27 Jul 2021 17:30	1

ALS Houston, US Date: 27-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070616

QC BATCH REPORT

Batch ID: R387642 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210716** Units: **ug/L** Analysis Date: **16-Jul-2021 12:53**
Client ID: Run ID: **VOA6_387642** SeqNo: **6187049** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*45.21*	*1.0*	*50*	*0*	*90.4*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.51*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*48.96*	*1.0*	*50*	*0*	*97.9*	*80 - 119*				
Surr: Toluene-d8	*52.04*	*1.0*	*50*	*0*	*104*	*89 - 112*				

LCS Sample ID: **VLCSW-210716** Units: **ug/L** Analysis Date: **16-Jul-2021 11:49**
Client ID: Run ID: **VOA6_387642** SeqNo: **6187048** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.45	1.0	20	0	102	80 - 119				
1,1-Dichloroethene	19.41	1.0	20	0	97.1	71 - 131				
1,2-Dichloroethane	19.52	1.0	20	0	97.6	73 - 128				
cis-1,2-Dichloroethene	19.5	1.0	20	0	97.5	78 - 123				
Methylene chloride	19.19	2.0	20	0	96.0	74 - 124				
Trichloroethene	21.36	1.0	20	0	107	79 - 123				
Vinyl chloride	15.46	1.0	20	0	77.3	58 - 137				
Surr: 1,2-Dichloroethane-d4	*49.6*	*1.0*	*50*	*0*	*99.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.98*	*1.0*	*50*	*0*	*96.0*	*85 - 114*				
Surr: Dibromofluoromethane	*50.85*	*1.0*	*50*	*0*	*102*	*80 - 119*				
Surr: Toluene-d8	*46.94*	*1.0*	*50*	*0*	*93.9*	*89 - 112*				

ALS Houston, US Date: 27-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070616

QC BATCH REPORT

Batch ID: R387642 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS21070510-08MS** Units: **ug/L** Analysis Date: **16-Jul-2021 16:23**
Client ID: Run ID: **VOA6_387642** SeqNo: **6187059** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.15	1.0	20	0	95.7	80 - 119				
1,1-Dichloroethene	24.11	1.0	20	0	121	71 - 131				
1,2-Dichloroethane	18.85	1.0	20	0	94.2	73 - 128				
cis-1,2-Dichloroethene	22.13	1.0	20	0	111	78 - 123				
Methylene chloride	19.41	2.0	20	0	97.1	74 - 124				
Trichloroethene	20.71	1.0	20	0	104	79 - 123				
Vinyl chloride	18.64	1.0	20	0	93.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.71*	*1.0*	*50*	*0*	*107*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.04*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*55.22*	*1.0*	*50*	*0*	*110*	*80 - 119*				
Surr: Toluene-d8	*49.61*	*1.0*	*50*	*0*	*99.2*	*89 - 112*				

MSD Sample ID: **HS21070510-08MSD** Units: **ug/L** Analysis Date: **16-Jul-2021 16:44**
Client ID: Run ID: **VOA6_387642** SeqNo: **6187060** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.31	1.0	20	0	96.6	80 - 119	19.15	0.861	20	
1,1-Dichloroethene	22.08	1.0	20	0	110	71 - 131	24.11	8.77	20	
1,2-Dichloroethane	18.21	1.0	20	0	91.1	73 - 128	18.85	3.42	20	
cis-1,2-Dichloroethene	20.6	1.0	20	0	103	78 - 123	22.13	7.16	20	
Methylene chloride	19.25	2.0	20	0	96.2	74 - 124	19.41	0.846	20	
Trichloroethene	19.5	1.0	20	0	97.5	79 - 123	20.71	6.03	20	
Vinyl chloride	17.67	1.0	20	0	88.4	58 - 137	18.64	5.32	20	
Surr: 1,2-Dichloroethane-d4	*54.97*	*1.0*	*50*	*0*	*110*	*81 - 118*	*53.71*	*2.31*	*20*	
Surr: 4-Bromofluorobenzene	*50*	*1.0*	*50*	*0*	*100*	*85 - 114*	*51.04*	*2.05*	*20*	
Surr: Dibromofluoromethane	*54.95*	*1.0*	*50*	*0*	*110*	*80 - 119*	*55.22*	*0.492*	*20*	
Surr: Toluene-d8	*51.18*	*1.0*	*50*	*0*	*102*	*89 - 112*	*49.61*	*3.12*	*20*	

The following samples were analyzed in this batch:

HS21070616-01	HS21070616-02	HS21070616-03	HS21070616-04
HS21070616-05	HS21070616-06	HS21070616-07	HS21070616-08
HS21070616-09	HS21070616-10		

ALS Houston, US Date: 27-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: **HS21070616**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	21-022-0	26-Mar-2022
Dept of Defense	PJLA L20-507-R2	22-Dec-2021
Florida	E87611-33	30-Jun-2022
Illinois	2000322021-7	09-May-2022
Kansas	E-10352 2020-2021	31-Jul-2021
Kansas	E-10352 2021-2022	31-Jul-2022
Kentucky	123043, 2021-2022	30-Apr-2022
Louisiana	03087, 2021-2022	30-Jun-2022
North Carolina	624-2021	31-Dec-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-21-27	30-Apr-2022
Utah	TX026932021-10	31-Jul-2021

ALS Houston, US Date: 27-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21070616

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS21070616-01	16WW44-210712	Login	7/13/2021 4:48:32 PM	PJM	Disposed
HS21070616-01	16WW44-210712	Login	7/13/2021 4:48:32 PM	PJM	Sub
HS21070616-01	16WW44-210712	Login	7/13/2021 4:48:32 PM	PJM	Disposed
HS21070616-02	16WW37-210712	Login	7/13/2021 4:48:32 PM	PJM	Disposed
HS21070616-02	16WW37-210712	Login	7/13/2021 4:48:32 PM	PJM	Sub
HS21070616-02	16WW37-210712	Login	7/13/2021 4:48:32 PM	PJM	Disposed
HS21070616-03	16WW38-210712	Login	7/13/2021 4:48:32 PM	PJM	Disposed
HS21070616-03	16WW38-210712	Login	7/13/2021 4:48:32 PM	PJM	Sub
HS21070616-03	16WW38-210712	Login	7/13/2021 4:48:32 PM	PJM	Disposed
HS21070616-04	16WW14-210712	Login	7/13/2021 4:48:32 PM	PJM	Disposed
HS21070616-04	16WW14-210712	Login	7/13/2021 4:48:32 PM	PJM	Sub
HS21070616-04	16WW14-210712	Login	7/13/2021 4:48:32 PM	PJM	Disposed
HS21070616-10	Trip Blank-210712	Login	7/13/2021 4:48:32 PM	PJM	Disposed

ALS Houston, US Date: 27-Jul-21

Sample Receipt Checklist

Work Order ID: HS21070616 **Date/Time Received:** **13-Jul-2021 09:20**

Client Name: CBI-Houston **Received by:** **Paresh M. Giga**

Completed By:	/S/ Pablo Marinez	13-Jul-2021 16:56	**Reviewed by:**	/S/ Ragen Giga	15-Jul-2021 09:44
	eSignature	Date/Time		eSignature	Date/Time

Matrices: **WATER** Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:CLIENT
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.1°C UC/C	IR 31
Cooler(s)/Kit(s):	24876	
Date/Time sample(s) sent to storage:	7/13/21 17:10	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

HS21070616

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant LHAAP 16 July 20

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 501032
Job: **LHAAP 16 July 2021**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16ww44-210712	wG	7/12/21/0735		4	X					X						
16ww37-210712	wG	7/12/21/0820		4	X					X						
16ww38-210712	wG	7/12/21/0900		4	X					X						
16ww14-210712	wG	7/12/21/0940		4	X					X						
16ww34-210712	wG	7/12/21/1025		4	X					X						
16ww34-210712-FD	wG	7/12/21/1025		4	X					X						
16ww33-210712	wG	7/12/21/1115		4	X					X						
16ww32-210712	wG	7/12/21/1205		4	X					X						

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	7/12/21	1430		7/13/2021	09:20						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:
24876 GIC
1.1°
-0.3
Clear.

HS21070616

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant LHAAP 16 July 20

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 501032
Job: **LHAAP 16 July 2021**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D. / Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16WW31-210712	W6	7/12/21/1255		4	X					X						
TRIP BLANK-210712	W	7/12/21		2	X											

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	7/12/21	1430		7/13/2021	0920						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

ALS
10450 Stanciiff Rd. Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

24876

CUSTODY SEAL

Date: 7/12/21 Time: 1430

Name:

Company:

Seal Broken By:

7/13/21

FedEx
9473 0845 1335

TUE - 13 JUL AA
PRIORITY OVERNIGHT

AB SGRA 24876

77099
TX-US
IAH

5499257 12Jul2021 GGGA 560C2/8265/1823

July 27, 2021 Service Request No:E2100795

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

Laboratory Results for: HS21070616

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory July 14, 2021
For your reference, these analyses have been assigned our service request number **E2100795.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental



Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100795
Project:	HS21070616	**Date Received:**	07/14/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Nine samples were received for analysis at ALS Environmental in Houston on 07/14/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samplse were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100447: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for these extraction batches. The LCS and DLCS recoveries are within QC limits.

Sample E2100795-003/005/006/007/008/009; lowest practical dilution performed. Multiple dilutions were attempted until passing Internal Standard ranges were achieved. Carbon cleanup was also performed to reduce organic interference.

DoD certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2100795
Project: HS21070616

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100795-001	16WW44-210712	7/12/2021	0735
E2100795-002	16WW37-210712	7/12/2021	0820
E2100795-003	16WW38-210712	7/12/2021	0900
E2100795-004	16WW14-210712	7/12/2021	0940
E2100795-005	16WW34-210712	7/12/2021	1025
E2100795-006	16WW34-210712-FD	7/12/2021	1025
E2100795-007	16WW33-210712	7/12/2021	1115
E2100795-008	16WW32-210712	7/12/2021	1205
E2100795-009	16WW31-210712	7/12/2021	1255

Service Request Summary

Folder #: **E2100795**
Client Name: ALS Environmental - US
Project Name: HS21070616
Project Number:

Report To: Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 07/14/21
Internal Due Date: 7/27/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21070616
EDD: No EDD Specified

9 125 mL-Plastic Bottle Plastic
Location: EHRMS-AirArch 1
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100795-001	16WW44-210712	Water	07/12/21 0735	**IV**
E2100795-002	16WW37-210712	Water	07/12/21 0820	**IV**
E2100795-003	16WW38-210712	Water	07/12/21 0900	**IV**
E2100795-004	16WW14-210712	Water	07/12/21 0940	**IV**
E2100795-005	16WW34-210712	Water	07/12/21 1025	**IV**
E2100795-006	16WW34-210712-FD	Water	07/12/21 1025	**IV**
E2100795-007	16WW33-210712	Water	07/12/21 1115	**IV**
E2100795-008	16WW32-210712	Water	07/12/21 1205	**IV**
E2100795-009	16WW31-210712	Water	07/12/21 1255	**IV**

Service Request Summary

Folder #: **E2100795**
Client Name: ALS Environmental - US
Project Name: HS21070616
Project Number:

Report To: Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
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Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 07/14/21
Internal Due Date: 7/27/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21070616
EDD: No EDD Specified

9 125 mL-Plastic Bottle Plastic
Location: EHRMS-AirArch 1
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	9	Level II due 7/27,IV due 8/3

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

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ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arkansas Department of Environmental Quality	19-028-0	6/30/2022
Arkansas Department of Environmental Quality	21-022-0	3/26/2022
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-33	6/30/2022
Hawaii Department of Health	2021-2022	4/30/2022
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Kansas Department of Health and Environment	E-10352 2022	7/31/2022
Louisiana Department of Environmental Quality	03087-2021	6/30/2022
Louisiana Department of Health and Hospitals	LA028-2021	12/31/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Minnesota Department of Health	2021671	12/31/2021
Nevada Department of Concervation and Natural Resources	TX026932021-4	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209421	4/24/2022
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	68-03441-015	6/30/2022
Tennessee Department of Environment and Concervation	04016-2021	4/30/2022
Texas Commision on Environmental Quality	T104704231-21-27	4/30/2022
United States Department of Agriculture	P330-19-00299	10/10/2022
Utah Department of Health Environmental Laboratory Certification	TX026932021-10	7/31/2021

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
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Houston, TX 77099
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F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **16486**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS21070616
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21070616-01**	**16WW44-210712**	**GW**	**12 Jul 2021 07:35**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			27 Jul 2021
2.	**HS21070616-02**	**16WW37-210712**	**GW**	**12 Jul 2021 08:20**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			27 Jul 2021
3.	**HS21070616-03**	**16WW38-210712**	**GW**	**12 Jul 2021 09:00**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			27 Jul 2021
4.	**HS21070616-04**	**16WW14-210712**	**GW**	**12 Jul 2021 09:40**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			27 Jul 2021
5.	**HS21070616-05**	**16WW34-210712**	**GW**	**12 Jul 2021 10:25**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			27 Jul 2021
6.	**HS21070616-06**	**16WW34-210712-FD**	**GW**	**12 Jul 2021 10:25**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			27 Jul 2021
7.	**HS21070616-07**	**16WW33-210712**	**GW**	**12 Jul 2021 11:15**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			27 Jul 2021
8.	**HS21070616-08**	**16WW32-210712**	**GW**	**12 Jul 2021 12:05**

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 16486**

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			27 Jul 2021
9.	**HS21070616-09**	**16WW31-210712**	**GW**	**12 Jul 2021 12:55**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			27 Jul 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 7/14/21 9:00am

Received By: CORETTA Date/Time: 7/14/21 0800

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

Cooler Receipt Form

Project Chemist CA

Client/Project ALS-H

Thermometer ID IR1

Date/Time Received: 7/14/21 Initials: CA

Date/Time Logged in: 7/14/21 Initials CA

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ● ALS Courier ○ Client

2. Samples received in: ● Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ● No

Were they intact? ○ Yes ○ No ● N/A

Were they signed and dated? ○ Yes ○ No ● N/A

If yes, how many and where?

4. Packing Material: ○ Inserts ● Baggies ○ Bubble Wrap ○ Gel Packs ● Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		7/14/21	0800	CA	4.2	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ● Yes ○ No

7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ● Yes ○ No

8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ● Yes ○ No

9. Were appropriate bottles/containers and volumes received for the requested tests? ● Yes ○ No

10. Did sample labels and tags agree with custody documents? ● Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 383580 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 7/20/21 15:28

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100794-001	16WW25-210713	.01	6850/ClO4 DOD			Water	10mL	
2	E2100794-002	16WW25-210713-FD	.01	6850/ClO4 DOD			Water	10mL	
3	E2100794-003	16WW26-210713	.01	6850/ClO4 DOD			Water	10mL	
4	E2100794-004	16WW55-210713	.01	6850/ClO4 DOD			Water	10mL	
5	E2100794-005	16WW48-210713	.01	6850/ClO4 DOD			Water	10mL	
6	E2100794-006	16EW01-210713	.01	6850/ClO4 DOD			Water	10mL	
7	E2100794-007	16PM02-210713	.01	6850/ClO4 DOD			Water	10mL	
8	E2100794-008	16PM03-210713	.01	6850/ClO4 DOD			Water	10mL	
9	E2100794-009	16PM03-210713-FD	.01	6850/ClO4 DOD			Water	10mL	
10	E2100794-010	16PM06-210713	.01	6850/ClO4 DOD			Water	10mL	
11	E2100795-001	16WW44-210712	.01	6850/ClO4 DOD			Water	10mL	
12	E2100795-002	16WW37-210712	.01	6850/ClO4 DOD			Water	10mL	
13	E2100795-003	16WW38-210712	.01	6850/ClO4 DOD			Water	10mL	
14	E2100795-004	16WW14-210712	.01	6850/ClO4 DOD			Water	10mL	
15	E2100795-005	16WW34-210712	.01	6850/ClO4 DOD			Water	10mL	
16	E2100795-006	16WW34-210712-FD	.01	6850/ClO4 DOD			Water	10mL	
17	E2100795-007	16WW33-210712	.01	6850/ClO4 DOD			Water	10mL	
18	E2100795-008	16WW32-210712	.01	6850/ClO4 DOD			Water	10mL	
19	E2100795-009	16WW31-210712	.01	6850/ClO4 DOD			Water	10mL	
20	EQ2100447-01	MB		6850/ClO4 DOD			Liquid	10mL	
21	EQ2100447-02	LCS		6850/ClO4 DOD			Liquid	10mL	
22	EQ2100447-03	DLCS		6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 214765 Logbook Ref: Sodium Perchlorate Expires On: 12/11/2022

E2100794-001	100.00µL	E2100794-002	100.00µL	E2100794-003	100.00µL	E2100794-005	100.00µL	E2100794-006	100.00µL	E2100794-007	100.00µL
E2100794-010	100.00µL	E2100795-001	100.00µL	E2100795-002	100.00µL	E2100795-003	100.00µL	E2100795-004	100.00µL	E2100795-005	100.00µL
E2100795-006	100.00µL	E2100795-007	100.00µL	E2100795-008	100.00µL	E2100795-009	100.00µL	EQ2100447-01	100.00µL	EQ2100447-02	100.00µL
EQ2100447-03	100.00µL										

Name: Perchlorate Intermediate Stock1 Inventory ID 217422 Logbook Ref: Perchlorate Expires On: 11/26/2021

EQ2100447-02	1.00µL	EQ2100447-03	1.00µL

Preparation Information Benchsheet

Prep Run#: 383580 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 7/20/21 15:28

Preparation Steps

Step: Preparation
Started: 7/20/21 15:28
Finished: 7/20/21 16:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 7/20/21

Chain of Custody

Relinquished By:		Date:		Extracts Examined
Received By:		Date:		Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100795
Project:	HS21070616	**Date Collected:**	7/12/21 0735
Sample Matrix:	Water	**Date Received:**	7/14/21
Sample Name:	16WW44-210712	**Units:**	µg/L
Lab Code:	E2100795-001	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**1.35**		1.00	0.500	0.250	10	7/20/21	7/27/21 11:39	383580	732749	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100795
Project:	HS21070616	**Date Collected:**	7/12/21 0820
Sample Matrix:	Water	**Date Received:**	7/14/21
Sample Name:	16WW37-210712	**Units:**	µg/L
Lab Code:	E2100795-002	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**2.74**		2.00	1.00	0.500	20	7/20/21	7/27/21 14:19	383580	732749	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100795
Project:	HS21070616	**Date Collected:**	7/12/21 0900
Sample Matrix:	Water	**Date Received:**	7/14/21
Sample Name:	16WW38-210712	**Units:**	µg/L
Lab Code:	E2100795-003	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	5.00	2.50	1.25	50	7/20/21	7/27/21 13:13	383580	732749	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100795
Project:	HS21070616	**Date Collected:**	7/12/21 0940
Sample Matrix:	Water	**Date Received:**	7/14/21
Sample Name:	16WW14-210712	**Units:**	µg/L
Lab Code:	E2100795-004	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.210**		0.100	0.0500	0.0250	1	7/20/21	7/21/21 17:00	383580	732081	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100795
Project:	HS21070616	**Date Collected:**	7/12/21 1025
Sample Matrix:	Water	**Date Received:**	7/14/21
Sample Name:	16WW34-210712	**Units:**	µg/L
Lab Code:	E2100795-005	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	5.00	2.50	1.25	50	7/20/21	7/27/21 13:21	383580	732749	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100795
Project:	HS21070616	**Date Collected:**	7/12/21 1025
Sample Matrix:	Water	**Date Received:**	7/14/21
Sample Name:	16WW34-210712-FD	**Units:**	µg/L
Lab Code:	E2100795-006	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	5.00	2.50	1.25	50	7/20/21	7/27/21 13:30	383580	732749	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100795
Project:	HS21070616	**Date Collected:**	7/12/21 1115
Sample Matrix:	Water	**Date Received:**	7/14/21
Sample Name:	16WW33-210712	**Units:**	µg/L
Lab Code:	E2100795-007	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	10.0	5.00	2.50	100	7/20/21	7/27/21 13:38	383580	732749	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100795
Project:	HS21070616	**Date Collected:**	7/12/21 1205
Sample Matrix:	Water	**Date Received:**	7/14/21
Sample Name:	16WW32-210712	**Units:**	µg/L
Lab Code:	E2100795-008	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	10.0	5.00	2.50	100	7/20/21	7/27/21 13:47	383580	732749	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100795
Project:	HS21070616	**Date Collected:**	7/12/21 1255
Sample Matrix:	Water	**Date Received:**	7/14/21
Sample Name:	16WW31-210712	**Units:**	µg/L
Lab Code:	E2100795-009	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	5.00	2.50	1.25	50	7/20/21	7/27/21 13:55	383580	732749	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100795
Project:	HS21070616	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100447-01	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	7/20/21	7/21/21 16:08	383580	732081	

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21070616
Sample Matrix: Water

Service Request: E2100795
Date Analyzed: 7/21/21

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Units: µg/L
Basis: As Received

Extraction Lot: 383580

	Lab Control Sample EQ2100447-02			Duplicate Lab Control Sample EQ2100447-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0985	0.100	99	0.0881	0.100	88	84 - 119	11	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100795
Project:	HS21070616	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100447-02	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0985**	J	0.100	0.0500	0.0250	1	7/20/21	7/21/21 16:16	383580	732081	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100795
Project:	HS21070616	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100447-03	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0881**	J	0.100	0.0500	0.0250	1	7/20/21	7/21/21 16:25	383580	732081	

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July 30, 2021

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
10333 Richmond Ave
Ste 1030
Houston, TX 77042

Work Order: **HS21070667**

Laboratory Results for: **Longhorn Army Ammunition Plant LHAAP 16 July 2021**

Dear Vicki Graves ,

ALS Environmental received 11 sample(s) on Jul 14, 2021 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
Ragen Giga
Project Manager

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21070667

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21070667-01	16WW25-210713	GW		13-Jul-2021 06:55	14-Jul-2021 10:05	☐
HS21070667-02	16WW25-210713-FD	GW		13-Jul-2021 06:55	14-Jul-2021 10:05	☐
HS21070667-03	16WW26-210713	GW		13-Jul-2021 07:45	14-Jul-2021 10:05	☐
HS21070667-04	16WW55-210713	GW		13-Jul-2021 08:35	14-Jul-2021 10:05	☐
HS21070667-05	16WW48-210713	GW		13-Jul-2021 09:25	14-Jul-2021 10:05	☐
HS21070667-06	16EW01-210713	GW		13-Jul-2021 10:20	14-Jul-2021 10:05	☐
HS21070667-07	16PM02-210713	GW		13-Jul-2021 11:05	14-Jul-2021 10:05	☐
HS21070667-08	16PM03-210713	GW		13-Jul-2021 11:50	14-Jul-2021 10:05	☐
HS21070667-09	16PM03-210713-FD	GW		13-Jul-2021 11:50	14-Jul-2021 10:05	☐
HS21070667-10	16PM06-210713	GW		13-Jul-2021 12:35	14-Jul-2021 10:05	☐
HS21070667-11	Trip Blank-210713	Water	CG-061121-146	13-Jul-2021 00:00	14-Jul-2021 10:05	☐

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21070667

Work Order Comments

- 16PM03-210713-FD & 16PM06-210713 - VOC vial 1 of 3 contains >6mm headspace

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston Specialty Lab. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R387998

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R387950

Sample ID: 16EW01-210713 (HS21070667-06)

- Lowest practical dilution due to matrix.

Sample ID: 16WW25-210713 (HS21070667-01MS)

- MS and MS/MSD RPD recovered outside control limits for cis-1,2-Dichloroethene.

WetChemistry by Method SM5310B

Batch ID: R388162,R388180

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM2320B

Batch ID: R387558

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21070667

WetChemistry by Method SW9056

Batch ID: R387537

Sample ID: 16EW01-210713 (HS21070667-06)

- Sample ran at 2X due to high concentration of Sulfate

Sample ID: 16WW25-210713 (HS21070667-01)

- Sample ran at 5X due to high concentration of Sulfate

Sample ID: 16WW25-210713-FD (HS21070667-02)

- Sample ran at 5X due to high concentration of Sulfate

Sample ID: 16WW26-210713 (HS21070667-03MS)

- The MS and/or MSD recovery was outside of the control limits; however, the result in the parent sample is greater than 4x the spike amount. (Sulfate)

Sample ID: 16WW48-210713 (HS21070667-05)

- Sample ran at 2X due to high concentration of Sulfate

Sample ID: 16WW55-210713 (HS21070667-04)

- Sample ran at 2X due to high concentration of Sulfate

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070667
Sample ID: 16WW25-210713 Lab ID:HS21070667-01
Collection Date: 13-Jul-2021 06:55 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	21-Jul-2021 13:08
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 13:08
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 13:08
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 13:08
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	21-Jul-2021 13:08
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 13:08
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 13:08
Surr: 1,2-Dichloroethane-d4	*114*			**0**	*81-118*	*%REC*	*1*	*21-Jul-2021 13:08*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*21-Jul-2021 13:08*
Surr: Dibromofluoromethane	*111*			**0**	*80-119*	*%REC*	*1*	*21-Jul-2021 13:08*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*21-Jul-2021 13:08*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	21-Jul-2021 11:35
Ethene	**0.000657**	J	**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	21-Jul-2021 11:35
Methane	**0.0145**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	21-Jul-2021 11:35
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**60.0**		**5.00**	**5.00**	**5.00**	**mg/L**	1	15-Jul-2021 22:01
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**37.8**		**0.500**	**1.00**	**1.00**	**mg/L**	1	23-Jul-2021 14:24
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**2.63**		**0.150**	**0.500**	**0.500**	**mg/L**	5	14-Jul-2021 15:01
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	14-Jul-2021 15:01
Sulfate	**5,570**		**100**	**250**	**250**	**mg/L**	500	14-Jul-2021 22:32
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Jul-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
ANALYTICAL REPORT
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070667
Sample ID: 16WW25-210713-FD Lab ID:HS21070667-02
Collection Date: 13-Jul-2021 06:55 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	21-Jul-2021 13:29
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 13:29
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 13:29
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 13:29
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	21-Jul-2021 13:29
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 13:29
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 13:29
Surr: 1,2-Dichloroethane-d4	*114*			**0**	*81-118*	*%REC*	*1*	*21-Jul-2021 13:29*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*21-Jul-2021 13:29*
Surr: Dibromofluoromethane	*111*			**0**	*80-119*	*%REC*	*1*	*21-Jul-2021 13:29*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*21-Jul-2021 13:29*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	21-Jul-2021 11:45
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	21-Jul-2021 11:45
Methane	**0.0140**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	21-Jul-2021 11:45
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**54.3**		**5.00**	**5.00**	**5.00**	**mg/L**	1	15-Jul-2021 22:06
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**37.3**		**0.500**	**1.00**	**1.00**	**mg/L**	1	23-Jul-2021 14:36
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**2.50**		**0.150**	**0.500**	**0.500**	**mg/L**	5	14-Jul-2021 15:08
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	14-Jul-2021 15:08
Sulfate	**5,340**		**100**	**250**	**250**	**mg/L**	500	14-Jul-2021 22:39
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Jul-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070667
Sample ID: 16WW26-210713 Lab ID:HS21070667-03
Collection Date: 13-Jul-2021 07:45 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	21-Jul-2021 13:51
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 13:51
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 13:51
cis-1,2-Dichloroethene	**3.7**		**0.20**	**0.50**	**1.0**	**ug/L**	1	21-Jul-2021 13:51
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	21-Jul-2021 13:51
Trichloroethene	**26**		**0.20**	**0.50**	**1.0**	**ug/L**	1	21-Jul-2021 13:51
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 13:51
Surr: 1,2-Dichloroethane-d4	*115*			**0**	*81-118*	*%REC*	*1*	*21-Jul-2021 13:51*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*21-Jul-2021 13:51*
Surr: Dibromofluoromethane	*114*			**0**	*80-119*	*%REC*	*1*	*21-Jul-2021 13:51*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*21-Jul-2021 13:51*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	21-Jul-2021 11:53
Ethene	**0.000852**	J	**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	21-Jul-2021 11:53
Methane	**0.00154**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	21-Jul-2021 11:53
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**15.2**		**5.00**	**5.00**	**5.00**	**mg/L**	1	15-Jul-2021 22:11
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**3.18**		**0.500**	**1.00**	**1.00**	**mg/L**	1	23-Jul-2021 14:51
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**0.282**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	14-Jul-2021 15:15
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	14-Jul-2021 15:15
Sulfate	**341**		**2.00**	**5.00**	**5.00**	**mg/L**	10	14-Jul-2021 22:46
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Jul-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastructure, Inc.
ANALYTICAL REPORT
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070667
Sample ID: 16WW55-210713 Lab ID:HS21070667-04
Collection Date: 13-Jul-2021 08:35 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	21-Jul-2021 14:12
1,1-Dichloroethene	**5.8**		**1.0**	**2.5**	**5.0**	**ug/L**	5	21-Jul-2021 14:12
1,2-Dichloroethane	**3.3**	J	**1.0**	**2.5**	**5.0**	**ug/L**	5	21-Jul-2021 14:12
cis-1,2-Dichloroethene	**270**		**1.0**	**2.5**	**5.0**	**ug/L**	5	21-Jul-2021 14:12
Methylene chloride	5.0	U	2.0	5.0	10	ug/L	5	21-Jul-2021 14:12
Trichloroethene	**1,900**		**10**	**25**	**50**	**ug/L**	50	21-Jul-2021 15:36
Vinyl chloride	**14**		**1.0**	**2.5**	**5.0**	**ug/L**	5	21-Jul-2021 14:12
Surr: 1,2-Dichloroethane-d4	*113*			**0**	*81-118*	*%REC*	*5*	*21-Jul-2021 14:12*
Surr: 1,2-Dichloroethane-d4	*112*			**0**	*81-118*	*%REC*	*50*	*21-Jul-2021 15:36*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*5*	*21-Jul-2021 14:12*
Surr: 4-Bromofluorobenzene	*99.5*			**0**	*85-114*	*%REC*	*50*	*21-Jul-2021 15:36*
Surr: Dibromofluoromethane	*110*			**0**	*80-119*	*%REC*	*5*	*21-Jul-2021 14:12*
Surr: Dibromofluoromethane	*113*			**0**	*80-119*	*%REC*	*50*	*21-Jul-2021 15:36*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*5*	*21-Jul-2021 14:12*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*50*	*21-Jul-2021 15:36*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	**0.000642**	J	**0.000144**	**0.000250**	**0.00100**	**mg/L**	1	21-Jul-2021 12:01
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	21-Jul-2021 12:01
Methane	**0.0182**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	21-Jul-2021 12:01
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**333**		**5.00**	**5.00**	**5.00**	**mg/L**	1	15-Jul-2021 22:17
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**7.07**		**0.500**	**1.00**	**1.00**	**mg/L**	1	23-Jul-2021 15:06
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**7.42**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	14-Jul-2021 15:52
Nitrogen, Nitrate (As N)	**0.214**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	14-Jul-2021 15:52
Sulfate	**932**		**4.00**	**10.0**	**10.0**	**mg/L**	20	14-Jul-2021 22:54
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Jul-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Sample ID: 16WW48-210713
Collection Date: 13-Jul-2021 09:25

ANALYTICAL REPORT
WorkOrder:HS21070667
Lab ID:HS21070667-05
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	21-Jul-2021 14:33
1,1-Dichloroethene	**40**		**2.0**	**5.0**	**10**	**ug/L**	10	21-Jul-2021 14:33
1,2-Dichloroethane	**34**		**2.0**	**5.0**	**10**	**ug/L**	10	21-Jul-2021 14:33
cis-1,2-Dichloroethene	**18,000**		**20**	**50**	**100**	**ug/L**	100	21-Jul-2021 15:57
Methylene chloride	10	U	4.0	10	20	ug/L	10	21-Jul-2021 14:33
Trichloroethene	**13,000**		**20**	**50**	**100**	**ug/L**	100	21-Jul-2021 15:57
Vinyl chloride	**110**		**2.0**	**5.0**	**10**	**ug/L**	10	21-Jul-2021 14:33
Surr: 1,2-Dichloroethane-d4	*113*			**0**	*81-118*	*%REC*	*100*	*21-Jul-2021 15:57*
Surr: 1,2-Dichloroethane-d4	*112*			**0**	*81-118*	*%REC*	*10*	*21-Jul-2021 14:33*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*100*	*21-Jul-2021 15:57*
Surr: 4-Bromofluorobenzene	*98.0*			**0**	*85-114*	*%REC*	*10*	*21-Jul-2021 14:33*
Surr: Dibromofluoromethane	*111*			**0**	*80-119*	*%REC*	*100*	*21-Jul-2021 15:57*
Surr: Dibromofluoromethane	*110*			**0**	*80-119*	*%REC*	*10*	*21-Jul-2021 14:33*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*10*	*21-Jul-2021 14:33*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*100*	*21-Jul-2021 15:57*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	21-Jul-2021 12:11
Ethene	**0.00687**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	21-Jul-2021 12:11
Methane	**0.00350**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	21-Jul-2021 12:11
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**379**		**5.00**	**5.00**	**5.00**	**mg/L**	1	15-Jul-2021 22:23
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**12.4**		**0.500**	**1.00**	**1.00**	**mg/L**	1	23-Jul-2021 17:56
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**7.85**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	14-Jul-2021 16:00
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	14-Jul-2021 16:00
Sulfate	**2,550**		**40.0**	**100**	**100**	**mg/L**	200	14-Jul-2021 23:46
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Jul-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070667
Sample ID: 16EW01-210713 Lab ID:HS21070667-06
Collection Date: 13-Jul-2021 10:20 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	21-Jul-2021 17:21
1,1-Dichloroethene	**7.4**	J	**2.0**	**5.0**	**10**	**ug/L**	10	21-Jul-2021 17:21
1,2-Dichloroethane	**7.1**	J	**2.0**	**5.0**	**10**	**ug/L**	10	21-Jul-2021 17:21
cis-1,2-Dichloroethene	**2,000**		**2.0**	**5.0**	**10**	**ug/L**	10	21-Jul-2021 17:21
Methylene chloride	10	U	4.0	10	20	ug/L	10	21-Jul-2021 17:21
Trichloroethene	**990**		**2.0**	**5.0**	**10**	**ug/L**	10	21-Jul-2021 17:21
Vinyl chloride	**100**		**2.0**	**5.0**	**10**	**ug/L**	10	21-Jul-2021 17:21
Surr: 1,2-Dichloroethane-d4	*113*		**0**	*81-118*		*%REC*	*10*	*21-Jul-2021 17:21*
Surr: 4-Bromofluorobenzene	*99.8*		**0**	*85-114*		*%REC*	*10*	*21-Jul-2021 17:21*
Surr: Dibromofluoromethane	*110*		**0**	*80-119*		*%REC*	*10*	*21-Jul-2021 17:21*
Surr: Toluene-d8	*108*		**0**	*89-112*		*%REC*	*10*	*21-Jul-2021 17:21*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	21-Jul-2021 12:20
Ethene	**0.0202**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	21-Jul-2021 12:20
Methane	**0.0890**		**0.000535**	**0.00125**	**0.00250**	**mg/L**	5	21-Jul-2021 12:43
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**397**		**5.00**	**5.00**	**5.00**	**mg/L**	1	15-Jul-2021 22:30
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**12.1**		**0.500**	**1.00**	**1.00**	**mg/L**	1	23-Jul-2021 18:11
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**7.26**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	14-Jul-2021 16:07
Nitrogen, Nitrate (As N)	**1.66**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	14-Jul-2021 16:07
Sulfate	**2,290**		**40.0**	**100**	**100**	**mg/L**	200	14-Jul-2021 23:53
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Jul-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070667
Sample ID: 16PM02-210713 Lab ID:HS21070667-07
Collection Date: 13-Jul-2021 11:05 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	25	U	7.5	25	25	ug/L	25	21-Jul-2021 19:27
1,1-Dichloroethene	**32**		**5.0**	**12**	**25**	**ug/L**	25	21-Jul-2021 19:27
1,2-Dichloroethane	**15**	J	**5.0**	**12**	**25**	**ug/L**	25	21-Jul-2021 19:27
cis-1,2-Dichloroethene	**3,400**		**5.0**	**12**	**25**	**ug/L**	25	21-Jul-2021 19:27
Methylene chloride	25	U	10	25	50	ug/L	25	21-Jul-2021 19:27
Trichloroethene	**17,000**		**50**	**120**	**250**	**ug/L**	250	21-Jul-2021 19:48
Vinyl chloride	**43**		**5.0**	**12**	**25**	**ug/L**	25	21-Jul-2021 19:27
Surr: 1,2-Dichloroethane-d4	*116*			**0**	*81-118*	*%REC*	*25*	*21-Jul-2021 19:27*
Surr: 1,2-Dichloroethane-d4	*116*			**0**	*81-118*	*%REC*	*250*	*21-Jul-2021 19:48*
Surr: 4-Bromofluorobenzene	*99.6*			**0**	*85-114*	*%REC*	*25*	*21-Jul-2021 19:27*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*250*	*21-Jul-2021 19:48*
Surr: Dibromofluoromethane	*112*			**0**	*80-119*	*%REC*	*25*	*21-Jul-2021 19:27*
Surr: Dibromofluoromethane	*113*			**0**	*80-119*	*%REC*	*250*	*21-Jul-2021 19:48*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*25*	*21-Jul-2021 19:27*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*250*	*21-Jul-2021 19:48*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Jul-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
ANALYTICAL REPORT
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070667
Sample ID: 16PM03-210713 Lab ID:HS21070667-08
Collection Date: 13-Jul-2021 11:50 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	21-Jul-2021 18:03
1,1-Dichloroethene	**37**		**2.0**	**5.0**	**10**	**ug/L**	10	21-Jul-2021 18:03
1,2-Dichloroethane	**20**		**2.0**	**5.0**	**10**	**ug/L**	10	21-Jul-2021 18:03
cis-1,2-Dichloroethene	**8,300**		**20**	**50**	**100**	**ug/L**	100	21-Jul-2021 18:24
Methylene chloride	10	U	4.0	10	20	ug/L	10	21-Jul-2021 18:03
Trichloroethene	**8,400**		**20**	**50**	**100**	**ug/L**	100	21-Jul-2021 18:24
Vinyl chloride	**220**		**2.0**	**5.0**	**10**	**ug/L**	10	21-Jul-2021 18:03
Surr: 1,2-Dichloroethane-d4	*113*			**0**	*81-118*	*%REC*	*10*	*21-Jul-2021 18:03*
Surr: 1,2-Dichloroethane-d4	*116*			**0**	*81-118*	*%REC*	*100*	*21-Jul-2021 18:24*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*100*	*21-Jul-2021 18:24*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*10*	*21-Jul-2021 18:03*
Surr: Dibromofluoromethane	*113*			**0**	*80-119*	*%REC*	*10*	*21-Jul-2021 18:03*
Surr: Dibromofluoromethane	*112*			**0**	*80-119*	*%REC*	*100*	*21-Jul-2021 18:24*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*100*	*21-Jul-2021 18:24*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*10*	*21-Jul-2021 18:03*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Jul-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070667
Sample ID: 16PM03-210713-FD Lab ID:HS21070667-09
Collection Date: 13-Jul-2021 11:50 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	21-Jul-2021 18:45
1,1-Dichloroethene	**36**		**2.0**	**5.0**	**10**	**ug/L**	10	21-Jul-2021 18:45
1,2-Dichloroethane	**20**		**2.0**	**5.0**	**10**	**ug/L**	10	21-Jul-2021 18:45
cis-1,2-Dichloroethene	**8,000**		**20**	**50**	**100**	**ug/L**	100	21-Jul-2021 19:06
Methylene chloride	10	U	4.0	10	20	ug/L	10	21-Jul-2021 18:45
Trichloroethene	**8,400**		**20**	**50**	**100**	**ug/L**	100	21-Jul-2021 19:06
Vinyl chloride	**230**		**2.0**	**5.0**	**10**	**ug/L**	10	21-Jul-2021 18:45
Surr: 1,2-Dichloroethane-d4	*114*			**0**	*81-118*	*%REC*	*10*	*21-Jul-2021 18:45*
Surr: 1,2-Dichloroethane-d4	*115*			**0**	*81-118*	*%REC*	*100*	*21-Jul-2021 19:06*
Surr: 4-Bromofluorobenzene	*98.8*			**0**	*85-114*	*%REC*	*10*	*21-Jul-2021 18:45*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*100*	*21-Jul-2021 19:06*
Surr: Dibromofluoromethane	*112*			**0**	*80-119*	*%REC*	*10*	*21-Jul-2021 18:45*
Surr: Dibromofluoromethane	*113*			**0**	*80-119*	*%REC*	*100*	*21-Jul-2021 19:06*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*10*	*21-Jul-2021 18:45*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*100*	*21-Jul-2021 19:06*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Jul-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070667
Sample ID: 16PM06-210713 Lab ID:HS21070667-10
Collection Date: 13-Jul-2021 12:35 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	50	U	15	50	50	ug/L	50	21-Jul-2021 20:09
1,1-Dichloroethene	**100**		**10**	**25**	**50**	**ug/L**	50	21-Jul-2021 20:09
1,2-Dichloroethane	**35**	J	**10**	**25**	**50**	**ug/L**	50	21-Jul-2021 20:09
cis-1,2-Dichloroethene	**38,000**		**100**	**250**	**500**	**ug/L**	500	21-Jul-2021 20:30
Methylene chloride	50	U	20	50	100	ug/L	50	21-Jul-2021 20:09
Trichloroethene	**57,000**		**100**	**250**	**500**	**ug/L**	500	21-Jul-2021 20:30
Vinyl chloride	**930**		**10**	**25**	**50**	**ug/L**	50	21-Jul-2021 20:09
Surr: 1,2-Dichloroethane-d4	*115*			**0**	*81-118*	*%REC*	*50*	*21-Jul-2021 20:09*
Surr: 1,2-Dichloroethane-d4	*114*			**0**	*81-118*	*%REC*	*500*	*21-Jul-2021 20:30*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*50*	*21-Jul-2021 20:09*
Surr: 4-Bromofluorobenzene	*98.6*			**0**	*85-114*	*%REC*	*500*	*21-Jul-2021 20:30*
Surr: Dibromofluoromethane	*112*			**0**	*80-119*	*%REC*	*50*	*21-Jul-2021 20:09*
Surr: Dibromofluoromethane	*114*			**0**	*80-119*	*%REC*	*500*	*21-Jul-2021 20:30*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*50*	*21-Jul-2021 20:09*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*500*	*21-Jul-2021 20:30*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Jul-2021 15:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
ANALYTICAL REPORT
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070667
Sample ID: Trip Blank-210713 Lab ID:HS21070667-11
Collection Date: 13-Jul-2021 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	21-Jul-2021 12:47
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 12:47
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 12:47
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 12:47
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	21-Jul-2021 12:47
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 12:47
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 12:47
Surr: 1,2-Dichloroethane-d4	*114*			**0**	*81-118*	*%REC*	*1*	*21-Jul-2021 12:47*
Surr: 4-Bromofluorobenzene	*98.5*			**0**	*85-114*	*%REC*	*1*	*21-Jul-2021 12:47*
Surr: Dibromofluoromethane	*110*			**0**	*80-119*	*%REC*	*1*	*21-Jul-2021 12:47*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*21-Jul-2021 12:47*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070667

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R387537 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** GW	
HS21070667-01	16WW25-210713	13 Jul 2021 06:55			14 Jul 2021 22:32	500
HS21070667-01	16WW25-210713	13 Jul 2021 06:55			14 Jul 2021 15:01	5
HS21070667-02	16WW25-210713-FD	13 Jul 2021 06:55			14 Jul 2021 22:39	500
HS21070667-02	16WW25-210713-FD	13 Jul 2021 06:55			14 Jul 2021 15:08	5
HS21070667-03	16WW26-210713	13 Jul 2021 07:45			14 Jul 2021 22:46	10
HS21070667-03	16WW26-210713	13 Jul 2021 07:45			14 Jul 2021 15:15	1
HS21070667-04	16WW55-210713	13 Jul 2021 08:35			14 Jul 2021 22:54	20
HS21070667-04	16WW55-210713	13 Jul 2021 08:35			14 Jul 2021 15:52	2
HS21070667-05	16WW48-210713	13 Jul 2021 09:25			14 Jul 2021 23:46	200
HS21070667-05	16WW48-210713	13 Jul 2021 09:25			14 Jul 2021 16:00	2
HS21070667-06	16EW01-210713	13 Jul 2021 10:20			14 Jul 2021 23:53	200
HS21070667-06	16EW01-210713	13 Jul 2021 10:20			14 Jul 2021 16:07	2
Batch ID: R387558 (0)	**Test Name :** ALKALINITY BY SM 2320B-2011				**Matrix:** GW	
HS21070667-01	16WW25-210713	13 Jul 2021 06:55			15 Jul 2021 22:01	1
HS21070667-02	16WW25-210713-FD	13 Jul 2021 06:55			15 Jul 2021 22:06	1
HS21070667-03	16WW26-210713	13 Jul 2021 07:45			15 Jul 2021 22:11	1
HS21070667-04	16WW55-210713	13 Jul 2021 08:35			15 Jul 2021 22:17	1
HS21070667-05	16WW48-210713	13 Jul 2021 09:25			15 Jul 2021 22:23	1
HS21070667-06	16EW01-210713	13 Jul 2021 10:20			15 Jul 2021 22:30	1
Batch ID: R387950 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21070667-11	Trip Blank-210713	13 Jul 2021 00:00			21 Jul 2021 12:47	1
Batch ID: R387950 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** GW	
HS21070667-01	16WW25-210713	13 Jul 2021 06:55			21 Jul 2021 13:08	1
HS21070667-02	16WW25-210713-FD	13 Jul 2021 06:55			21 Jul 2021 13:29	1
HS21070667-03	16WW26-210713	13 Jul 2021 07:45			21 Jul 2021 13:51	1
HS21070667-04	16WW55-210713	13 Jul 2021 08:35			21 Jul 2021 15:36	50
HS21070667-04	16WW55-210713	13 Jul 2021 08:35			21 Jul 2021 14:12	5
HS21070667-05	16WW48-210713	13 Jul 2021 09:25			21 Jul 2021 15:57	100
HS21070667-05	16WW48-210713	13 Jul 2021 09:25			21 Jul 2021 14:33	10
HS21070667-06	16EW01-210713	13 Jul 2021 10:20			21 Jul 2021 17:21	10
HS21070667-07	16PM02-210713	13 Jul 2021 11:05			21 Jul 2021 19:48	250
HS21070667-07	16PM02-210713	13 Jul 2021 11:05			21 Jul 2021 19:27	25
HS21070667-08	16PM03-210713	13 Jul 2021 11:50			21 Jul 2021 18:24	100
HS21070667-08	16PM03-210713	13 Jul 2021 11:50			21 Jul 2021 18:03	10
HS21070667-09	16PM03-210713-FD	13 Jul 2021 11:50			21 Jul 2021 19:06	100
HS21070667-09	16PM03-210713-FD	13 Jul 2021 11:50			21 Jul 2021 18:45	10
HS21070667-10	16PM06-210713	13 Jul 2021 12:35			21 Jul 2021 20:30	500
HS21070667-10	16PM06-210713	13 Jul 2021 12:35			21 Jul 2021 20:09	50

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070667

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R387998 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** GW	
HS21070667-01	16WW25-210713	13 Jul 2021 06:55			21 Jul 2021 11:35	1
HS21070667-02	16WW25-210713-FD	13 Jul 2021 06:55			21 Jul 2021 11:45	1
HS21070667-03	16WW26-210713	13 Jul 2021 07:45			21 Jul 2021 11:53	1
HS21070667-04	16WW55-210713	13 Jul 2021 08:35			21 Jul 2021 12:01	1
HS21070667-05	16WW48-210713	13 Jul 2021 09:25			21 Jul 2021 12:11	1
HS21070667-06	16EW01-210713	13 Jul 2021 10:20			21 Jul 2021 12:43	5
HS21070667-06	16EW01-210713	13 Jul 2021 10:20			21 Jul 2021 12:20	1
Batch ID: R388162 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B-2011				**Matrix:** GW	
HS21070667-01	16WW25-210713	13 Jul 2021 06:55			23 Jul 2021 14:24	1
HS21070667-02	16WW25-210713-FD	13 Jul 2021 06:55			23 Jul 2021 14:36	1
HS21070667-03	16WW26-210713	13 Jul 2021 07:45			23 Jul 2021 14:51	1
HS21070667-04	16WW55-210713	13 Jul 2021 08:35			23 Jul 2021 15:06	1
Batch ID: R388180 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B-2011				**Matrix:** GW	
HS21070667-05	16WW48-210713	13 Jul 2021 09:25			23 Jul 2021 17:56	1
HS21070667-06	16EW01-210713	13 Jul 2021 10:20			23 Jul 2021 18:11	1
Batch ID: R388607 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** GW	
HS21070667-01	16WW25-210713	13 Jul 2021 06:55			30 Jul 2021 15:53	1
HS21070667-02	16WW25-210713-FD	13 Jul 2021 06:55			30 Jul 2021 15:53	1
HS21070667-03	16WW26-210713	13 Jul 2021 07:45			30 Jul 2021 15:53	1
HS21070667-04	16WW55-210713	13 Jul 2021 08:35			30 Jul 2021 15:53	1
HS21070667-05	16WW48-210713	13 Jul 2021 09:25			30 Jul 2021 15:53	1
HS21070667-06	16EW01-210713	13 Jul 2021 10:20			30 Jul 2021 15:53	1
HS21070667-07	16PM02-210713	13 Jul 2021 11:05			30 Jul 2021 15:53	1
HS21070667-08	16PM03-210713	13 Jul 2021 11:50			30 Jul 2021 15:53	1
HS21070667-09	16PM03-210713-FD	13 Jul 2021 11:50			30 Jul 2021 15:53	1
HS21070667-10	16PM06-210713	13 Jul 2021 12:35			30 Jul 2021 15:53	1

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070667

QC BATCH REPORT

Batch ID: R387998 (0) **Instrument: FID-4** **Method: DISSOLVED GASES BY RSK-175**

MBLK Sample ID: **MBLK-210721** Units: **mg/L** Analysis Date: **21-Jul-2021 11:10**
Client ID: Run ID: **FID-4_387998** SeqNo: **6194757** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000250	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000250	0.000500								U

LCS Sample ID: **LCS-210721** Units: **mg/L** Analysis Date: **21-Jul-2021 11:18**
Client ID: Run ID: **FID-4_387998** SeqNo: **6194758** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0201	0.00100	0.01804	0	111	75 - 125				
Ethene	0.0152	0.00100	0.0168	0	90.8	75 - 125				
Methane	0.0103	0.000500	0.009647	0	107	75 - 125				

LCSD Sample ID: **LCSD-210721** Units: **mg/L** Analysis Date: **21-Jul-2021 11:26**
Client ID: Run ID: **FID-4_387998** SeqNo: **6194759** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0197	0.00100	0.01804	0	109	75 - 125	0.02011	2	30	
Ethene	0.0163	0.00100	0.0168	0	96.8	75 - 125	0.01525	6.42	30	
Methane	0.0105	0.000500	0.009647	0	109	75 - 125	0.01032	1.45	30	

The following samples were analyzed in this batch: HS21070667-01 HS21070667-02 HS21070667-03 HS21070667-04 HS21070667-05 HS21070667-06

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070667

QC BATCH REPORT

Batch ID: R387950 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210721** Units: **ug/L** Analysis Date: **21-Jul-2021 12:26**
Client ID: Run ID: **VOA6_387950** SeqNo: **6194026** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*55.52*	*1.0*	*50*	*0*	*111*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.38*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*55.56*	*1.0*	*50*	*0*	*111*	*80 - 119*				
Surr: Toluene-d8	*53.62*	*1.0*	*50*	*0*	*107*	*89 - 112*				

LCS Sample ID: **VLCSW-210721** Units: **ug/L** Analysis Date: **21-Jul-2021 11:44**
Client ID: Run ID: **VOA6_387950** SeqNo: **6194025** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.12	1.0	20	0	95.6	80 - 119				
1,1-Dichloroethene	22.43	1.0	20	0	112	71 - 131				
1,2-Dichloroethane	19.39	1.0	20	0	96.9	73 - 128				
cis-1,2-Dichloroethene	21.74	1.0	20	0	109	78 - 123				
Methylene chloride	20.83	2.0	20	0	104	74 - 124				
Trichloroethene	19.42	1.0	20	0	97.1	79 - 123				
Vinyl chloride	17.41	1.0	20	0	87.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*58.08*	*1.0*	*50*	*0*	*116*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.17*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*58.51*	*1.0*	*50*	*0*	*117*	*80 - 119*				
Surr: Toluene-d8	*48.65*	*1.0*	*50*	*0*	*97.3*	*89 - 112*				

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070667

QC BATCH REPORT

Batch ID: R387950 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21070667-01MS** Units: **ug/L** Analysis Date: **21-Jul-2021 14:54**
Client ID: **16WW25-210713** Run ID: **VOA6_387950** SeqNo: **6194033** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.59	1.0	20	0	87.9	80 - 119				
1,1-Dichloroethene	20.96	1.0	20	0	105	71 - 131				
1,2-Dichloroethane	16.8	1.0	20	0	84.0	73 - 128				
cis-1,2-Dichloroethene	26.87	1.0	20	0	134	78 - 123				S
Methylene chloride	18.22	2.0	20	0	91.1	74 - 124				
Trichloroethene	21.48	1.0	20	0	107	79 - 123				
Vinyl chloride	15.25	1.0	20	0	76.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*55.16*	*1.0*	*50*	*0*	*110*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.04*	*1.0*	*50*	*0*	*100*	*85 - 114*				
Surr: Dibromofluoromethane	*55.59*	*1.0*	*50*	*0*	*111*	*80 - 119*				
Surr: Toluene-d8	*52.17*	*1.0*	*50*	*0*	*104*	*89 - 112*				

MSD Sample ID: **HS21070667-01MSD** Units: **ug/L** Analysis Date: **21-Jul-2021 15:15**
Client ID: **16WW25-210713** Run ID: **VOA6_387950** SeqNo: **6194034** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.24	1.0	20	0	91.2	80 - 119	17.59	3.62	20	
1,1-Dichloroethene	19.99	1.0	20	0	99.9	71 - 131	20.96	4.76	20	
1,2-Dichloroethane	16.72	1.0	20	0	83.6	73 - 128	16.8	0.49	20	
cis-1,2-Dichloroethene	20.03	1.0	20	0	100	78 - 123	26.87	29.2	20	R
Methylene chloride	17.73	2.0	20	0	88.6	74 - 124	18.22	2.72	20	
Trichloroethene	18.78	1.0	20	0	93.9	79 - 123	21.48	13.4	20	
Vinyl chloride	14.2	1.0	20	0	71.0	58 - 137	15.25	7.13	20	
Surr: 1,2-Dichloroethane-d4	*57.05*	*1.0*	*50*	*0*	*114*	*81 - 118*	*55.16*	*3.37*	*20*	
Surr: 4-Bromofluorobenzene	*50.2*	*1.0*	*50*	*0*	*100*	*85 - 114*	*50.04*	*0.309*	*20*	
Surr: Dibromofluoromethane	*54.28*	*1.0*	*50*	*0*	*109*	*80 - 119*	*55.59*	*2.38*	*20*	
Surr: Toluene-d8	*52.52*	*1.0*	*50*	*0*	*105*	*89 - 112*	*52.17*	*0.679*	*20*	

The following samples were analyzed in this batch:

HS21070667-01	HS21070667-02	HS21070667-03	HS21070667-04
HS21070667-05	HS21070667-06	HS21070667-07	HS21070667-08
HS21070667-09	HS21070667-10	HS21070667-11	

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070667

QC BATCH REPORT

Batch ID: R387537 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **14-Jul-2021 09:46**
Client ID: Run ID: **ICS-Integrion_387537** SeqNo: **6184521** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS** Units: **mg/L** Analysis Date: **14-Jul-2021 09:53**
Client ID: Run ID: **ICS-Integrion_387537** SeqNo: **6184522** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	4.207	0.100	4	0	105	80 - 120				
Nitrogen, Nitrate (As N)	4.151	0.100	4	0	104	80 - 120				
Sulfate	20.81	0.500	20	0	104	80 - 120				

MS Sample ID: **HS21070678-11MS** Units: **mg/L** Analysis Date: **14-Jul-2021 21:55**
Client ID: Run ID: **ICS-Integrion_387537** SeqNo: **6184554** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.03	0.100	2	0	102	80 - 120				
Nitrogen, Nitrate (As N)	2.481	0.100	2	0.499	99.1	80 - 120				
Sulfate	23.36	0.500	10	14.03	93.3	80 - 120				

MS Sample ID: **HS21070667-03MS** Units: **mg/L** Analysis Date: **14-Jul-2021 15:23**
Client ID: **16WW26-210713** Run ID: **ICS-Integrion_387537** SeqNo: **6184534** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.366	0.100	2	0.2817	104	80 - 120				
Nitrogen, Nitrate (As N)	2.015	0.100	2	0	101	80 - 120				
Sulfate	327.7	0.500	10	335.4	-77.9	80 - 120				SEO

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070667

QC BATCH REPORT

Batch ID: R387537 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS21070678-11MSD** Units: **mg/L** Analysis Date: **14-Jul-2021 22:02**
Client ID: Run ID: **ICS-Integrion_387537** SeqNo: **6184555** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.032	0.100	2	0	102	80 - 120	2.03	0.108	20	
Nitrogen, Nitrate (As N)	2.486	0.100	2	0.499	99.3	80 - 120	2.481	0.165	20	
Sulfate	23.42	0.500	10	14.03	93.9	80 - 120	23.36	0.257	20	

MSD Sample ID: **HS21070667-03MSD** Units: **mg/L** Analysis Date: **14-Jul-2021 15:30**
Client ID: **16WW26-210713** Run ID: **ICS-Integrion_387537** SeqNo: **6184535** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.221	0.100	2	0.2817	97.0	80 - 120	2.366	6.34	20	
Nitrogen, Nitrate (As N)	2.024	0.100	2	0	101	80 - 120	2.015	0.441	20	
Sulfate	327.6	0.500	10	335.4	-78.8	80 - 120	327.7	0.0276	20	SEO

The following samples were analyzed in this batch: HS21070667-01 HS21070667-02 HS21070667-03 HS21070667-04 HS21070667-05 HS21070667-06

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070667

QC BATCH REPORT

Batch ID: R387558 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM 2320B-2011**

MBLK Sample ID: **WBLKW1-210715** Units: **mg/L** Analysis Date: **15-Jul-2021 19:24**
Client ID: Run ID: **ManTech01_387558** SeqNo: **6185158** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **LCS1-210715** Units: **mg/L** Analysis Date: **15-Jul-2021 19:32**
Client ID: Run ID: **ManTech01_387558** SeqNo: **6185159** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1025	5.00	1000	0	103	85 - 115				

LCSD Sample ID: **LCSD1-210715** Units: **mg/L** Analysis Date: **15-Jul-2021 19:41**
Client ID: Run ID: **ManTech01_387558** SeqNo: **6185160** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1026	5.00	1000	0	103	85 - 115	1025	0.0478	20	

DUP Sample ID: **HS21070771-04DUP** Units: **mg/L** Analysis Date: **15-Jul-2021 19:54**
Client ID: Run ID: **ManTech01_387558** SeqNo: **6185162** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	78.1	5.00					77.29	1.04	20	

DUP Sample ID: **HS21070486-02DUP** Units: **mg/L** Analysis Date: **15-Jul-2021 21:31**
Client ID: Run ID: **ManTech01_387558** SeqNo: **6185176** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	626	5.00					621	0.797	20	

The following samples were analyzed in this batch: HS21070667-01 HS21070667-02 HS21070667-03 HS21070667-04 HS21070667-05 HS21070667-06

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070667

QC BATCH REPORT

Batch ID: R388162 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B-2011**

MBLK Sample ID: **MBLK-07232021** Units: **mg/L** Analysis Date: **23-Jul-2021 12:44**
Client ID: Run ID: **TOC_04_388162** SeqNo: **6198874** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **LCS-07232021** Units: **mg/L** Analysis Date: **23-Jul-2021 12:56**
Client ID: Run ID: **TOC_04_388162** SeqNo: **6198875** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	11.32	1.00	10	0	113	85 - 115				

LCSD Sample ID: **LCSD-07232021** Units: **mg/L** Analysis Date: **23-Jul-2021 13:08**
Client ID: Run ID: **TOC_04_388162** SeqNo: **6198876** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	11.04	1.00	10	0	110	85 - 115	11.32	2.5	20	

MS Sample ID: **HS21071112-01MS** Units: **mg/L** Analysis Date: **23-Jul-2021 16:38**
Client ID: Run ID: **TOC_04_388162** SeqNo: **6198889** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	18.72	1.00	10	7.494	112	80 - 120				

The following samples were analyzed in this batch: HS21070667-01 HS21070667-02 HS21070667-03 HS21070667-04

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070667

QC BATCH REPORT

Batch ID: R388180 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B-2011**

MBLK Sample ID: **MBLK-07232021** Units: **mg/L** Analysis Date: **23-Jul-2021 17:19**
Client ID: Run ID: **TOC_04_388180** SeqNo: **6198901** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **LCS-07232021** Units: **mg/L** Analysis Date: **23-Jul-2021 17:31**
Client ID: Run ID: **TOC_04_388180** SeqNo: **6198902** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.92	1.00	10	0	109	85 - 115				

LCSD Sample ID: **LCSD-07232021** Units: **mg/L** Analysis Date: **23-Jul-2021 17:43**
Client ID: Run ID: **TOC_04_388180** SeqNo: **6198903** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.98	1.00	10	0	110	85 - 115	10.92	0.548	20	

MS Sample ID: **HS21071078-01MS** Units: **mg/L** Analysis Date: **23-Jul-2021 20:11**
Client ID: Run ID: **TOC_04_388180** SeqNo: **6198914** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	17.74	1.00	10	5.775	120	80 - 120				

The following samples were analyzed in this batch: HS21070667-05 HS21070667-06

ALS Houston, US Date: 30-Jul-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: **HS21070667**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

ALS Houston, US Date: 30-Jul-21

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	21-022-0	26-Mar-2022
Dept of Defense	PJLA L20-507-R2	22-Dec-2021
Florida	E87611-33	30-Jun-2022
Illinois	2000322021-7	09-May-2022
Kansas	E-10352 2020-2021	31-Jul-2021
Kansas	E-10352 2021-2022	31-Jul-2022
Kentucky	123043, 2021-2022	30-Apr-2022
Louisiana	03087, 2021-2022	30-Jun-2022
North Carolina	624-2021	31-Dec-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-21-27	30-Apr-2022
Utah	TX026932021-10	31-Jul-2021

ALS Houston, US Date: 30-Jul-21

Sample Receipt Checklist

Work Order ID: HS21070667 **Date/Time Received:** **14-Jul-2021 10:05**

Client Name: CBI-Houston **Received by:** **Pablo Marinez**

Completed By: */S/ Pablo Marinez* (eSignature) 14-Jul-2021 12:36 (Date/Time) **Reviewed by:** (eSignature) (Date/Time)

Matrices: **WATER** Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:CLIENT
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	0.4°C UC/C	IR 31
Cooler(s)/Kit(s):	45083	
Date/Time sample(s) sent to storage:	7/14/21 12:50	

Water - VOA vials have zero headspace?	Yes ☐	No ☑	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes: 16PM03-210713-FD & 16PM06-210713 -
VOC vial 1 of 3 contains >6mm headspace

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

01155712

HS21070667

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant LHAAP 16 July 20

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: RJ Mednshia

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 501032
Job: **LHAAP 16 July 2021**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16WW25-210713	WG	7/13/21/0655		10	X	X	X	X	X	X						
16WW25-210713-FD	WG	07/13/21/0655		10	X	X	X	X	X	X						
16WW26-210713	WG	7/13/21/0745		10	X	X	X	X	X	X						
16WW55-210713	WG	7/13/21/0835		10	X	X	X	X	X	X						
16WW48-210713	WG	7/13/21/0925		10	X	X	X	X	X	X						
16EW01-210713	WG	7/13/21/1020		10	X	X	X	X	X	X						
16PM02-210713	WG	7/13/21/1105		4	X					X						
16PM03-210713	WG	7/13/21/1150		4	X					X						

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	7/13/21	1430					7/14/21	0955			

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

05083 0.4°
1951 0.6°

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

01155713

HS21070667

Aptim Environmental & Infrastucture, Inc.

Longhorn Army Ammunition Plant LHAAP 16 July 20

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: RJ Modashia

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 501032
Job: **LHAAP 16 July 2021**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16PMO3-210713-FD	WG	7/13/21/1150		4	X					X						
16PMO6-210713	WG	7/13/21/1235		4	X					X						
TRIPBLANK-210713	W	7/13/21		2	X											

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	7/13/21	1430								7/14	0905

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

(Word) S:\Forms\Chain of Custody - BiWeekly

01155714

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5667

45083

CUSTODY SEAL

Date: 7/13/21
Time: 1430
Company:

Seal Broken By:
Date: 7/14/21

FedEx
TRK# 9473 0845 1416
0221

WED - 14 JUL AA
PRIORITY OVERNIGHT

AB SGRA 45083

77099
TX-US
IAH

July 30, 2021 Service Request No:E2100794

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

Laboratory Results for: HS21070667

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory July 14, 2021
For your reference, these analyses have been assigned our service request number **E2100794.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100794
Project:	HS21070667	**Date Received:**	07/14/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Ten samples were received for analysis at ALS Environmental in Houston on 07/14/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100447: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for these extraction batches. The LCS and DLCS recoveries are within QC limits.

Multiple dilutions were attempted until passing Internal Standard ranges were achieved. Carbon cleanup was also performed to reduce organic interference for E2100794-001/002/003/007.

DoD certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2100794
Project: HS21070667

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100794-001	16WW25-210713	7/13/2021	0655
E2100794-002	16WW25-210713-FD	7/13/2021	0655
E2100794-003	16WW26-210713	7/13/2021	0745
E2100794-004	16WW55-210713	7/13/2021	0835
E2100794-005	16WW48-210713	7/13/2021	0925
E2100794-006	16EW01-210713	7/13/2021	1020
E2100794-007	16PM02-210713	7/13/2021	1105
E2100794-008	16PM03-210713	7/13/2021	1150
E2100794-009	16PM03-210713-FD	7/13/2021	1150
E2100794-010	16PM06-210713	7/13/2021	1235

Service Request Summary

Folder #: **E2100794**
Client Name: ALS Environmental - US
Project Name: HS21070667
Project Number:

Report To: Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 07/14/21
Internal Due Date: 7/28/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21070667
EDD: No EDD Specified

10 125 mL-Plastic Bottle Plastic
Location: EHRMS-AirArch 1
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100794-001	16WW25-210713	GW	07/13/21 0655	**IV**
E2100794-002	16WW25-210713-FD	GW	07/13/21 0655	**IV**
E2100794-003	16WW26-210713	GW	07/13/21 0745	**IV**
E2100794-004	16WW55-210713	GW	07/13/21 0835	**IV**
E2100794-005	16WW48-210713	GW	07/13/21 0925	**IV**
E2100794-006	16EW01-210713	GW	07/13/21 1020	**IV**
E2100794-007	16PM02-210713	GW	07/13/21 1105	**IV**
E2100794-008	16PM03-210713	GW	07/13/21 1150	**IV**
E2100794-009	16PM03-210713-FD	GW	07/13/21 1150	**IV**
E2100794-010	16PM06-210713	GW	07/13/21 1235	**IV**

Service Request Summary

Folder #: **E2100794**
Client Name: ALS Environmental - US
Project Name: HS21070667
Project Number:

Report To: Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 07/14/21
Internal Due Date: 7/28/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21070667
EDD: No EDD Specified

10 125 mL-Plastic Bottle Plastic
Location: EHRMS-AirArch 1
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	10	Level II due 7/28,IV due 8/4

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arkansas Department of Environmental Quality	19-028-0	6/30/2022
Arkansas Department of Environmental Quality	21-022-0	3/26/2022
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-33	6/30/2022
Hawaii Department of Health	2021-2022	4/30/2022
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Kansas Department of Health and Environment	E-10352 2022	7/31/2022
Louisiana Department of Environmental Quality	03087-2021	6/30/2022
Louisiana Department of Health and Hospitals	LA028-2021	12/31/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Minnesota Department of Health	2021671	12/31/2021
Nevada Department of Concervation and Natural Resources	TX026932021-4	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209421	4/24/2022
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	68-03441-015	6/30/2022
Tennessee Department of Environment and Concervation	04016-2021	4/30/2022
Texas Commision on Environmental Quality	T104704231-21-27	4/30/2022
United States Department of Agriculture	P330-19-00299	10/10/2022
Utah Department of Health Environmental Laboratory Certification	TX026932021-10	7/31/2021

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
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Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 16488**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	Ragen Giga
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RagenP.Giga@ALSGlobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS21070667
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21070667-01**	**16WW25-210713**	**GW**	**13 Jul 2021 06:55**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Jul 2021
2.	**HS21070667-02**	**16WW25-210713-FD**	**GW**	**13 Jul 2021 06:55**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Jul 2021
3.	**HS21070667-03**	**16WW26-210713**	**GW**	**13 Jul 2021 07:45**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Jul 2021
4.	**HS21070667-04**	**16WW55-210713**	**GW**	**13 Jul 2021 08:35**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Jul 2021
5.	**HS21070667-05**	**16WW48-210713**	**GW**	**13 Jul 2021 09:25**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Jul 2021
6.	**HS21070667-06**	**16EW01-210713**	**GW**	**13 Jul 2021 10:20**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Jul 2021
7.	**HS21070667-07**	**16PM02-210713**	**GW**	**13 Jul 2021 11:05**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Jul 2021
8.	**HS21070667-08**	**16PM03-210713**	**GW**	**13 Jul 2021 11:50**

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 16488**

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Jul 2021
9.	**HS21070667-09**	**16PM03-210713-FD**	**GW**	**13 Jul 2021 11:50**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Jul 2021
10.	**HS21070667-10**	**16PM06-210713**	**GW**	**13 Jul 2021 12:35**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			28 Jul 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 7/14/21 12:50

Received By: COREY C Date/Time: 7/14/21 1240

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

Cooler Receipt Form

Project Chemist CA

Client/Project ALS-H

Thermometer ID IR31

Date/Time Received: 7/14/21 Initials: CA Date/Time Logged in: 7/14/21 Initials CA

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ ALS Courier ○ Client

2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ✓ No
   Were they intact? ○ Yes ○ No ✓ N/A
   Were they signed and dated? ○ Yes ○ No ✓ N/A
   If yes, how many and where?

4. Packing Material: ○ Inserts ✓ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		7/14/21	1256	CA	3.2	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No
10. Did sample labels and tags agree with custody documents? ○ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 383580 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 7/20/21 15:28

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100794-001	16WW25-210713	.01	6850/ClO4 DOD			Water	10mL	
2	E2100794-002	16WW25-210713-FD	.01	6850/ClO4 DOD			Water	10mL	
3	E2100794-003	16WW26-210713	.01	6850/ClO4 DOD			Water	10mL	
4	E2100794-004	16WW55-210713	.01	6850/ClO4 DOD			Water	10mL	
5	E2100794-005	16WW48-210713	.01	6850/ClO4 DOD			Water	10mL	
6	E2100794-006	16EW01-210713	.01	6850/ClO4 DOD			Water	10mL	
7	E2100794-007	16PM02-210713	.01	6850/ClO4 DOD			Water	10mL	
8	E2100794-008	16PM03-210713	.01	6850/ClO4 DOD			Water	10mL	
9	E2100794-009	16PM03-210713-FD	.01	6850/ClO4 DOD			Water	10mL	
10	E2100794-010	16PM06-210713	.01	6850/ClO4 DOD			Water	10mL	
11	E2100795-001	16WW44-210712	.01	6850/ClO4 DOD			Water	10mL	
12	E2100795-002	16WW37-210712	.01	6850/ClO4 DOD			Water	10mL	
13	E2100795-003	16WW38-210712	.01	6850/ClO4 DOD			Water	10mL	
14	E2100795-004	16WW14-210712	.01	6850/ClO4 DOD			Water	10mL	
15	E2100795-005	16WW34-210712	.01	6850/ClO4 DOD			Water	10mL	
16	E2100795-006	16WW34-210712-FD	.01	6850/ClO4 DOD			Water	10mL	
17	E2100795-007	16WW33-210712	.01	6850/ClO4 DOD			Water	10mL	
18	E2100795-008	16WW32-210712	.01	6850/ClO4 DOD			Water	10mL	
19	E2100795-009	16WW31-210712	.01	6850/ClO4 DOD			Water	10mL	
20	EQ2100447-01	MB		6850/ClO4 DOD			Liquid	10mL	
21	EQ2100447-02	LCS		6850/ClO4 DOD			Liquid	10mL	
22	EQ2100447-03	DLCS		6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 214765 Logbook Ref: Sodium Perchlorate Expires On: 12/11/2022

E2100794-001	100.00µL	E2100794-002	100.00µL	E2100794-003	100.00µL	E2100794-005	100.00µL	E2100794-006	100.00µL	E2100794-007	100.00µL
E2100794-010	100.00µL	E2100795-001	100.00µL	E2100795-002	100.00µL	E2100795-003	100.00µL	E2100795-004	100.00µL	E2100795-005	100.00µL
E2100795-006	100.00µL	E2100795-007	100.00µL	E2100795-008	100.00µL	E2100795-009	100.00µL	EQ2100447-01	100.00µL	EQ2100447-02	100.00µL
EQ2100447-03	100.00µL										

Name: Perchlorate Intermediate Stock1 Inventory ID 217422 Logbook Ref: Perchlorate Expires On: 11/26/2021

EQ2100447-02	1.00µL	EQ2100447-03	1.00µL

Preparation Information Benchsheet

Prep Run#: 383580
Team: Semivoa GCMS/GRIVERA
Prep WorkFlow: GenExt28Day
Prep Method: Method
Status: Prepped
Prep Date/Time: 7/20/21 15:28

Preparation Steps

Step: Preparation
Started: 7/20/21 15:28
Finished: 7/20/21 16:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 7/20/21

Chain of Custody

Relinquished By: _____ Date: _____

Received By: _____ Date: _____

Extracts Examined
Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100794
Project:	HS21070667	**Date Collected:**	7/13/21 0655
Sample Matrix:	GW	**Date Received:**	7/14/21
Sample Name:	16WW25-210713	**Units:**	µg/L
Lab Code:	E2100794-001	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	2.00	1.00	0.500	20	7/20/21	7/27/21 12:47	383580	732749	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100794
Project:	HS21070667	**Date Collected:**	7/13/21 0655
Sample Matrix:	GW	**Date Received:**	7/14/21
Sample Name:	16WW25-210713-FD	**Units:**	µg/L
Lab Code:	E2100794-002	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	2.00	1.00	0.500	20	7/20/21	7/27/21 14:36	383580	732749	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100794
Project:	HS21070667	**Date Collected:**	7/13/21 0745
Sample Matrix:	GW	**Date Received:**	7/14/21
Sample Name:	16WW26-210713	**Units:**	µg/L
Lab Code:	E2100794-003	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	2.00	1.00	0.500	20	7/20/21	7/29/21 16:37	383580	733209	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100794
Project:	HS21070667	**Date Collected:**	7/13/21 0835
Sample Matrix:	GW	**Date Received:**	7/14/21
Sample Name:	16WW55-210713	**Units:**	µg/L
Lab Code:	E2100794-004	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**125**		5.00	2.50	1.25	50	7/20/21	7/28/21 09:59	383580	733215	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100794
Project:	HS21070667	**Date Collected:**	7/13/21 0925
Sample Matrix:	GW	**Date Received:**	7/14/21
Sample Name:	16WW48-210713	**Units:**	µg/L
Lab Code:	E2100794-005	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**53.7**		2.00	1.00	0.500	20	7/20/21	7/27/21 15:36	383580	732749	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100794
Project:	HS21070667	**Date Collected:**	7/13/21 1020
Sample Matrix:	GW	**Date Received:**	7/14/21
Sample Name:	16EW01-210713	**Units:**	µg/L
Lab Code:	E2100794-006	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**29.0**		1.00	0.500	0.250	10	7/20/21	7/27/21 16:53	383580	732749	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100794
Project:	HS21070667	**Date Collected:**	7/13/21 1105
Sample Matrix:	GW	**Date Received:**	7/14/21
Sample Name:	16PM02-210713	**Units:**	µg/L
Lab Code:	E2100794-007	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	5.00	2.50	1.25	50	7/20/21	7/27/21 20:01	383580	732749	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100794
Project:	HS21070667	**Date Collected:**	7/13/21 1150
Sample Matrix:	GW	**Date Received:**	7/14/21
Sample Name:	16PM03-210713	**Units:**	µg/L
Lab Code:	E2100794-008	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**118**		2.00	1.00	0.500	20	7/20/21	7/29/21 17:02	383580	733209	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100794
Project:	HS21070667	**Date Collected:**	7/13/21 1150
Sample Matrix:	GW	**Date Received:**	7/14/21
Sample Name:	16PM03-210713-FD	**Units:**	µg/L
Lab Code:	E2100794-009	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**117**		2.00	1.00	0.500	20	7/20/21	7/29/21 17:11	383580	733209	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100794
Project:	HS21070667	**Date Collected:**	7/13/21 1235
Sample Matrix:	GW	**Date Received:**	7/14/21
Sample Name:	16PM06-210713	**Units:**	µg/L
Lab Code:	E2100794-010	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0474**	J	0.100	0.0500	0.0250	1	7/20/21	7/21/21 20:43	383580	732081	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100794
Project:	HS21070667	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100447-01	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	7/20/21	7/21/21 16:08	383580	732081	

Accuracy & Precision

ALS Environmental - Houston HRMS
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ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100794
Project:	HS21070667	**Date Analyzed:**	7/21/21
Sample Matrix:	Water		

Lab Control Sample Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	As Received
		Extraction Lot:	383580

	Lab Control Sample EQ2100447-02			Duplicate Lab Control Sample EQ2100447-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0985	0.100	99	0.0881	0.100	88	84 - 119	11	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100794
Project:	HS21070667	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100447-02	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0985**	J	0.100	0.0500	0.0250	1	7/20/21	7/21/21 16:16	383580	732081	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100794
Project:	HS21070667	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100447-03	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0881**	J	0.100	0.0500	0.0250	1	7/20/21	7/21/21 16:25	383580	732081	

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August 10, 2021

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
10333 Richmond Ave
Ste 1030
Houston, TX 77042

Work Order: **HS21070744**

Laboratory Results for: **Longhorn Army Ammunition Plant LHAAP 16 July 2021**

Dear Vicki Graves ,

ALS Environmental received 9 sample(s) on Jul 15, 2021 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,



Generated By: JUMOKE.LAWAL
Ragen Giga
Project Manager

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21070744

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21070744-01	16WW58-210714	GW		14-Jul-2021 07:00	15-Jul-2021 09:25	☐
HS21070744-02	16WW57-210714	GW		14-Jul-2021 07:45	15-Jul-2021 09:25	☐
HS21070744-03	16WW35-210714	GW		14-Jul-2021 08:45	15-Jul-2021 09:25	☐
HS21070744-04	16WW36-210714	GW		14-Jul-2021 09:30	15-Jul-2021 09:25	☐
HS21070744-05	16IW09-210714	GW		14-Jul-2021 10:15	15-Jul-2021 09:25	☐
HS21070744-06	16RW05-210714	GW		14-Jul-2021 11:00	15-Jul-2021 09:25	☐
HS21070744-07	16WW23-210714	GW		14-Jul-2021 11:45	15-Jul-2021 09:25	☐
HS21070744-08	16WW24-210714	GW		14-Jul-2021 12:30	15-Jul-2021 09:25	☐
HS21070744-09	Trip Blank-210714	Water	CG-061121-131	14-Jul-2021 00:00	15-Jul-2021 09:25	☐

Revision:1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21070744

Work Order Comments

• Revision 1:

Report Revised to update sample ID for HS21070744-06 from 16RW09-210714 to 16RW05-210714.

16IW09-210714
VOC 1 of 3 vials & RSK 2 of 3 vials
contains >6mm headspace

The analysis for Perchlorate was subcontracted to ALS Houston Specialty Lab. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R387750

Sample ID: HS21070486-02MS

• MS and MSD are for an unrelated sample

GCMS Volatiles by Method SW8260

Batch ID: R388080

Sample ID: 16WW23-210714 (HS21070744-07)

• Surrogate 1,2-Dichloroethane-d4 exceeded recovery limits. Sample is ND.

Sample ID: 16WW24-210714 (HS21070744-08)

• Surrogate 1,2-Dichloroethane-d4 SURR exceeded recovery limits . Sample is ND.

Sample ID: 16WW35-210714 (HS21070744-03)

• Surrogate 1,2-Dichloroethane-d4 exceeded recovery limits due to matrix. confirmed by re-analysis @ dilution.

Sample ID: 16WW36-210714 (HS21070744-04)

• Surrogate 1,2-Dichloroethane-d4 exceeded recovery limits due to matrix. confirmed by re-analysis @ dilution.

Sample ID: 16WW58-210714 (HS21070744-01)

• Surrogate 1,2-Dichloroethane-d4 exceeded recovery limits due to matrix. confirmed by re-analysis @ dilution.

Sample ID: Trip Blank-210714 (HS21070744-09)

• Surrogate 1,2-Dichloroethane-d4 exceeded recovery limits . Sample is ND.

Sample ID: HS21070791-06MS

• MS and MSD are for an unrelated sample

Batch ID: R387950

Sample ID: HS21070667-01MS

• MS and MSD are for an unrelated sample

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21070744

WetChemistry by Method SM5310B

Batch ID: R388440,R388527

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM2320B

Batch ID: R388042

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: R387568

Sample ID: 16WW35-210714 (HS21070744-03)

- Sample ran at 5X due to high concentration of Sulfate

Sample ID: 16WW36-210714 (HS21070744-04)

- Sample ran at 5X due to high concentration of Sulfate

Sample ID: 16WW57-210714 (HS21070744-02)

- Sample ran at 2X due to high concentration of Sulfate

Batch ID: R387706

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070744
Sample ID: 16WW58-210714 Lab ID:HS21070744-01
Collection Date: 14-Jul-2021 07:00 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	22-Jul-2021 14:35
1,1-Dichloroethene	2.5	U	1.0	2.5	5.0	ug/L	5	22-Jul-2021 14:35
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	ug/L	5	22-Jul-2021 14:35
cis-1,2-Dichloroethene	**52**		**1.0**	**2.5**	**5.0**	**ug/L**	5	22-Jul-2021 14:35
Methylene chloride	5.0	U	2.0	5.0	10	ug/L	5	22-Jul-2021 14:35
Trichloroethene	**1,000**		**5.0**	**12**	**25**	**ug/L**	25	22-Jul-2021 16:41
Vinyl chloride	2.5	U	1.0	2.5	5.0	ug/L	5	22-Jul-2021 14:35
Surr: 1,2-Dichloroethane-d4	*111*			**0**	*81-118*	*%REC*	*25*	*22-Jul-2021 16:41*
Surr: 1,2-Dichloroethane-d4	*122*	*S*		**0**	*81-118*	*%REC*	*5*	*22-Jul-2021 14:35*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*5*	*22-Jul-2021 14:35*
Surr: 4-Bromofluorobenzene	*93.1*			**0**	*85-114*	*%REC*	*25*	*22-Jul-2021 16:41*
Surr: Dibromofluoromethane	*115*			**0**	*80-119*	*%REC*	*5*	*22-Jul-2021 14:35*
Surr: Dibromofluoromethane	*107*			**0**	*80-119*	*%REC*	*25*	*22-Jul-2021 16:41*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*5*	*22-Jul-2021 14:35*
Surr: Toluene-d8	*91.3*			**0**	*89-112*	*%REC*	*25*	*22-Jul-2021 16:41*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	19-Jul-2021 16:12
Ethene	**0.00215**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	19-Jul-2021 16:12
Methane	**0.00835**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	19-Jul-2021 16:12
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**99.2**		**5.00**	**5.00**	**5.00**	**mg/L**	1	23-Jul-2021 01:49
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**4.68**		**0.500**	**1.00**	**1.00**	**mg/L**	1	28-Jul-2021 21:53
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**2.30**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	15-Jul-2021 16:49
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	15-Jul-2021 16:49
Sulfate	**162**		**2.00**	**5.00**	**5.00**	**mg/L**	10	16-Jul-2021 17:28
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Jul-2021 18:39

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070744
Sample ID: 16WW57-210714 Lab ID:HS21070744-02
Collection Date: 14-Jul-2021 07:45 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	21-Jul-2021 16:39
1,1-Dichloroethene	**1.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	21-Jul-2021 16:39
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 16:39
cis-1,2-Dichloroethene	**0.80**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	21-Jul-2021 16:39
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	21-Jul-2021 16:39
Trichloroethene	**60**		**0.20**	**0.50**	**1.0**	**ug/L**	1	21-Jul-2021 16:39
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 16:39
Surr: 1,2-Dichloroethane-d4	*112*			**0**	*81-118*	*%REC*	*1*	*21-Jul-2021 16:39*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*21-Jul-2021 16:39*
Surr: Dibromofluoromethane	*110*			**0**	*80-119*	*%REC*	*1*	*21-Jul-2021 16:39*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*1*	*21-Jul-2021 16:39*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	19-Jul-2021 16:27
Ethene	**0.00108**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	19-Jul-2021 16:27
Methane	**0.00314**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	19-Jul-2021 16:27
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**126**		**5.00**	**5.00**	**5.00**	**mg/L**	1	23-Jul-2021 01:54
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**17.1**		**0.500**	**1.00**	**1.00**	**mg/L**	1	29-Jul-2021 12:33
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**1.96**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	15-Jul-2021 17:12
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	15-Jul-2021 17:12
Sulfate	**1,660**		**4.00**	**10.0**	**10.0**	**mg/L**	20	16-Jul-2021 17:36
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Jul-2021 18:39

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070744
Sample ID: 16WW35-210714 Lab ID:HS21070744-03
Collection Date: 14-Jul-2021 08:45 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	22-Jul-2021 14:56
1,1-Dichloroethene	**100**		**2.0**	**5.0**	**10**	**ug/L**	10	22-Jul-2021 14:56
1,2-Dichloroethane	5.0	U	2.0	5.0	10	ug/L	10	22-Jul-2021 14:56
cis-1,2-Dichloroethene	**2,000**		**20**	**50**	**100**	**ug/L**	100	22-Jul-2021 17:04
Methylene chloride	10	U	4.0	10	20	ug/L	10	22-Jul-2021 14:56
Trichloroethene	**8,100**		**20**	**50**	**100**	**ug/L**	100	22-Jul-2021 17:04
Vinyl chloride	**74**		**2.0**	**5.0**	**10**	**ug/L**	10	22-Jul-2021 14:56
Surr: 1,2-Dichloroethane-d4	*123*	*S*		**0**	*81-118*	*%REC*	*10*	*22-Jul-2021 14:56*
Surr: 1,2-Dichloroethane-d4	*110*			**0**	*81-118*	*%REC*	*100*	*22-Jul-2021 17:04*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*10*	*22-Jul-2021 14:56*
Surr: 4-Bromofluorobenzene	*94.6*			**0**	*85-114*	*%REC*	*100*	*22-Jul-2021 17:04*
Surr: Dibromofluoromethane	*117*			**0**	*80-119*	*%REC*	*10*	*22-Jul-2021 14:56*
Surr: Dibromofluoromethane	*104*			**0**	*80-119*	*%REC*	*100*	*22-Jul-2021 17:04*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*10*	*22-Jul-2021 14:56*
Surr: Toluene-d8	*91.6*			**0**	*89-112*	*%REC*	*100*	*22-Jul-2021 17:04*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	**0.00147**		**0.000144**	**0.000250**	**0.00100**	**mg/L**	1	19-Jul-2021 16:43
Ethene	**0.0118**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	19-Jul-2021 16:43
Methane	**0.0154**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	19-Jul-2021 17:29
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**1,080**		**5.00**	**5.00**	**5.00**	**mg/L**	1	23-Jul-2021 02:03
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**68.7**		**1.00**	**2.00**	**2.00**	**mg/L**	2	29-Jul-2021 12:46
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	0.500	U	0.150	0.500	0.500	mg/L	5	15-Jul-2021 17:19
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	15-Jul-2021 17:19
Sulfate	**4,850**		**100**	**250**	**250**	**mg/L**	500	16-Jul-2021 17:43
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Jul-2021 18:39

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070744
Sample ID: 16WW36-210714 Lab ID:HS21070744-04
Collection Date: 14-Jul-2021 09:30 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	**5.7**	J	**3.0**	**10**	**10**	**ug/L**	10	22-Jul-2021 15:17
1,1-Dichloroethene	**180**		**2.0**	**5.0**	**10**	**ug/L**	10	22-Jul-2021 15:17
1,2-Dichloroethane	**13**		**2.0**	**5.0**	**10**	**ug/L**	10	22-Jul-2021 15:17
cis-1,2-Dichloroethene	**17,000**		**20**	**50**	**100**	**ug/L**	100	22-Jul-2021 17:24
Methylene chloride	10	U	4.0	10	20	ug/L	10	22-Jul-2021 15:17
Trichloroethene	**15,000**		**20**	**50**	**100**	**ug/L**	100	22-Jul-2021 17:24
Vinyl chloride	**140**		**2.0**	**5.0**	**10**	**ug/L**	10	22-Jul-2021 15:17
Surr: 1,2-Dichloroethane-d4	*123*	*S*		**0**	*81-118*	*%REC*	*10*	*22-Jul-2021 15:17*
Surr: 1,2-Dichloroethane-d4	*109*			**0**	*81-118*	*%REC*	*100*	*22-Jul-2021 17:24*
Surr: 4-Bromofluorobenzene	*90.7*			**0**	*85-114*	*%REC*	*100*	*22-Jul-2021 17:24*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*10*	*22-Jul-2021 15:17*
Surr: Dibromofluoromethane	*116*			**0**	*80-119*	*%REC*	*10*	*22-Jul-2021 15:17*
Surr: Dibromofluoromethane	*103*			**0**	*80-119*	*%REC*	*100*	*22-Jul-2021 17:24*
Surr: Toluene-d8	*91.8*			**0**	*89-112*	*%REC*	*100*	*22-Jul-2021 17:24*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*10*	*22-Jul-2021 15:17*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	**0.00151**		**0.000144**	**0.000250**	**0.00100**	**mg/L**	1	19-Jul-2021 17:00
Ethene	**0.0117**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	19-Jul-2021 17:00
Methane	**0.325**		**0.00268**	**0.00625**	**0.0125**	**mg/L**	25	19-Jul-2021 17:43
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**462**		**5.00**	**5.00**	**5.00**	**mg/L**	1	23-Jul-2021 02:09
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**19.5**		**0.500**	**1.00**	**1.00**	**mg/L**	1	29-Jul-2021 12:58
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**0.931**		**0.150**	**0.500**	**0.500**	**mg/L**	5	15-Jul-2021 17:26
Nitrogen, Nitrate (As N)	**0.480**	J	**0.150**	**0.500**	**0.500**	**mg/L**	5	15-Jul-2021 17:26
Sulfate	**2,940**		**10.0**	**25.0**	**25.0**	**mg/L**	50	16-Jul-2021 17:51
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Jul-2021 18:39

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070744
Sample ID: 16IW09-210714 Lab ID:HS21070744-05
Collection Date: 14-Jul-2021 10:15 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	21-Jul-2021 17:00
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 17:00
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 17:00
cis-1,2-Dichloroethene	**4.6**		**0.20**	**0.50**	**1.0**	**ug/L**	1	21-Jul-2021 17:00
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	21-Jul-2021 17:00
Trichloroethene	**3.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	21-Jul-2021 17:00
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	21-Jul-2021 17:00
Surr: 1,2-Dichloroethane-d4	*116*			**0**	*81-118*	*%REC*	*1*	*21-Jul-2021 17:00*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*1*	*21-Jul-2021 17:00*
Surr: Dibromofluoromethane	*112*			**0**	*80-119*	*%REC*	*1*	*21-Jul-2021 17:00*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*1*	*21-Jul-2021 17:00*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	19-Jul-2021 17:14
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	19-Jul-2021 17:14
Methane	**1.46**		**0.0107**	**0.0250**	**0.0500**	**mg/L**	100	19-Jul-2021 17:57
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**649**		**5.00**	**5.00**	**5.00**	**mg/L**	1	23-Jul-2021 02:34
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**381**		**10.0**	**20.0**	**20.0**	**mg/L**	20	29-Jul-2021 13:14
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**4.02**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	15-Jul-2021 17:34
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	15-Jul-2021 17:34
Sulfate	**1.44**		**0.200**	**0.500**	**0.500**	**mg/L**	1	15-Jul-2021 17:34
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Jul-2021 18:39

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070744
Sample ID: 16RW05-210714 Lab ID:HS21070744-06
Collection Date: 14-Jul-2021 11:00 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	22-Jul-2021 13:11
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Jul-2021 13:11
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	22-Jul-2021 13:11
cis-1,2-Dichloroethene	**0.69**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	22-Jul-2021 13:11
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	22-Jul-2021 13:11
Trichloroethene	**1.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	22-Jul-2021 13:11
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	22-Jul-2021 13:11
Surr: 1,2-Dichloroethane-d4	*117*			**0**	*81-118*	*%REC*	*1*	*22-Jul-2021 13:11*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*22-Jul-2021 13:11*
Surr: Dibromofluoromethane	*115*			**0**	*80-119*	*%REC*	*1*	*22-Jul-2021 13:11*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*22-Jul-2021 13:11*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Jul-2021 18:39

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070744
Sample ID: 16WW23-210714 Lab ID:HS21070744-07
Collection Date: 14-Jul-2021 11:45 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	22-Jul-2021 13:32
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Jul-2021 13:32
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	22-Jul-2021 13:32
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Jul-2021 13:32
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	22-Jul-2021 13:32
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Jul-2021 13:32
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	22-Jul-2021 13:32
Surr: 1,2-Dichloroethane-d4	*121*	*S*		**0**	*81-118*	*%REC*	*1*	*22-Jul-2021 13:32*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*22-Jul-2021 13:32*
Surr: Dibromofluoromethane	*114*			**0**	*80-119*	*%REC*	*1*	*22-Jul-2021 13:32*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*22-Jul-2021 13:32*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Jul-2021 18:39

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070744
Sample ID: 16WW24-210714 Lab ID:HS21070744-08
Collection Date: 14-Jul-2021 12:30 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	22-Jul-2021 13:53
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Jul-2021 13:53
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	22-Jul-2021 13:53
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Jul-2021 13:53
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	22-Jul-2021 13:53
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Jul-2021 13:53
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	22-Jul-2021 13:53
Surr: 1,2-Dichloroethane-d4	*123*	*S*		**0**	*81-118*	*%REC*	*1*	*22-Jul-2021 13:53*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*1*	*22-Jul-2021 13:53*
Surr: Dibromofluoromethane	*114*			**0**	*80-119*	*%REC*	*1*	*22-Jul-2021 13:53*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*22-Jul-2021 13:53*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	30-Jul-2021 18:39

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21070744
Sample ID: Trip Blank-210714 Lab ID:HS21070744-09
Collection Date: 14-Jul-2021 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	22-Jul-2021 12:28
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Jul-2021 12:28
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	22-Jul-2021 12:28
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Jul-2021 12:28
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	22-Jul-2021 12:28
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Jul-2021 12:28
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	22-Jul-2021 12:28
Surr: 1,2-Dichloroethane-d4	*119*	*S*		**0**	*81-118*	*%REC*	*1*	*22-Jul-2021 12:28*
Surr: 4-Bromofluorobenzene	*99.4*			**0**	*85-114*	*%REC*	*1*	*22-Jul-2021 12:28*
Surr: Dibromofluoromethane	*113*			**0**	*80-119*	*%REC*	*1*	*22-Jul-2021 12:28*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*22-Jul-2021 12:28*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070744

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R387568 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** GW	
HS21070744-01	16WW58-210714	14 Jul 2021 07:00			15 Jul 2021 16:49	1
HS21070744-02	16WW57-210714	14 Jul 2021 07:45			15 Jul 2021 17:12	2
HS21070744-03	16WW35-210714	14 Jul 2021 08:45			15 Jul 2021 17:19	5
HS21070744-04	16WW36-210714	14 Jul 2021 09:30			15 Jul 2021 17:26	5
HS21070744-05	16IW09-210714	14 Jul 2021 10:15			15 Jul 2021 17:34	1
Batch ID: R387706 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** GW	
HS21070744-01	16WW58-210714	14 Jul 2021 07:00			16 Jul 2021 17:28	10
HS21070744-02	16WW57-210714	14 Jul 2021 07:45			16 Jul 2021 17:36	20
HS21070744-03	16WW35-210714	14 Jul 2021 08:45			16 Jul 2021 17:43	500
HS21070744-04	16WW36-210714	14 Jul 2021 09:30			16 Jul 2021 17:51	50
Batch ID: R387750 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** GW	
HS21070744-01	16WW58-210714	14 Jul 2021 07:00			19 Jul 2021 16:12	1
HS21070744-02	16WW57-210714	14 Jul 2021 07:45			19 Jul 2021 16:27	1
HS21070744-03	16WW35-210714	14 Jul 2021 08:45			19 Jul 2021 17:29	1
HS21070744-03	16WW35-210714	14 Jul 2021 08:45			19 Jul 2021 16:43	1
HS21070744-04	16WW36-210714	14 Jul 2021 09:30			19 Jul 2021 17:43	25
HS21070744-04	16WW36-210714	14 Jul 2021 09:30			19 Jul 2021 17:00	1
HS21070744-05	16IW09-210714	14 Jul 2021 10:15			19 Jul 2021 17:57	100
HS21070744-05	16IW09-210714	14 Jul 2021 10:15			19 Jul 2021 17:14	1
Batch ID: R387950 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** GW	
HS21070744-02	16WW57-210714	14 Jul 2021 07:45			21 Jul 2021 16:39	1
HS21070744-05	16IW09-210714	14 Jul 2021 10:15			21 Jul 2021 17:00	1
Batch ID: R388042 (0)	**Test Name :** ALKALINITY BY SM 2320B-2011				**Matrix:** GW	
HS21070744-01	16WW58-210714	14 Jul 2021 07:00			23 Jul 2021 01:49	1
HS21070744-02	16WW57-210714	14 Jul 2021 07:45			23 Jul 2021 01:54	1
HS21070744-03	16WW35-210714	14 Jul 2021 08:45			23 Jul 2021 02:03	1
HS21070744-04	16WW36-210714	14 Jul 2021 09:30			23 Jul 2021 02:09	1
HS21070744-05	16IW09-210714	14 Jul 2021 10:15			23 Jul 2021 02:34	1
Batch ID: R388080 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21070744-09	Trip Blank-210714	14 Jul 2021 00:00			22 Jul 2021 12:28	1

Revision: 1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070744

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R388080 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** GW	
HS21070744-01	16WW58-210714	14 Jul 2021 07:00			22 Jul 2021 16:41	25
HS21070744-01	16WW58-210714	14 Jul 2021 07:00			22 Jul 2021 14:35	5
HS21070744-03	16WW35-210714	14 Jul 2021 08:45			22 Jul 2021 17:04	100
HS21070744-03	16WW35-210714	14 Jul 2021 08:45			22 Jul 2021 14:56	10
HS21070744-04	16WW36-210714	14 Jul 2021 09:30			22 Jul 2021 17:24	100
HS21070744-04	16WW36-210714	14 Jul 2021 09:30			22 Jul 2021 15:17	10
HS21070744-06	16RW05-210714	14 Jul 2021 11:00			22 Jul 2021 13:11	1
HS21070744-07	16WW23-210714	14 Jul 2021 11:45			22 Jul 2021 13:32	1
HS21070744-08	16WW24-210714	14 Jul 2021 12:30			22 Jul 2021 13:53	1
Batch ID: R388440 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B-2011				**Matrix:** GW	
HS21070744-01	16WW58-210714	14 Jul 2021 07:00			28 Jul 2021 21:53	1
Batch ID: R388527 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B-2011				**Matrix:** GW	
HS21070744-02	16WW57-210714	14 Jul 2021 07:45			29 Jul 2021 12:33	1
HS21070744-03	16WW35-210714	14 Jul 2021 08:45			29 Jul 2021 12:46	2
HS21070744-04	16WW36-210714	14 Jul 2021 09:30			29 Jul 2021 12:58	1
HS21070744-05	16IW09-210714	14 Jul 2021 10:15			29 Jul 2021 13:14	20
Batch ID: R388621 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** GW	
HS21070744-01	16WW58-210714	14 Jul 2021 07:00			30 Jul 2021 18:39	1
HS21070744-02	16WW57-210714	14 Jul 2021 07:45			30 Jul 2021 18:39	1
HS21070744-03	16WW35-210714	14 Jul 2021 08:45			30 Jul 2021 18:39	1
HS21070744-04	16WW36-210714	14 Jul 2021 09:30			30 Jul 2021 18:39	1
HS21070744-05	16IW09-210714	14 Jul 2021 10:15			30 Jul 2021 18:39	1
HS21070744-06	16RW05-210714	14 Jul 2021 11:00			30 Jul 2021 18:39	1
HS21070744-07	16WW23-210714	14 Jul 2021 11:45			30 Jul 2021 18:39	1
HS21070744-08	16WW24-210714	14 Jul 2021 12:30			30 Jul 2021 18:39	1

Revision: 1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070744

QC BATCH REPORT

Batch ID: R387750 (0) **Instrument: FID-4** **Method: DISSOLVED GASES BY RSK-175**

MBLK Sample ID: **MBLK-210719** Units: **mg/L** Analysis Date: **19-Jul-2021 09:46**
Client ID: Run ID: **FID-4_387750** SeqNo: **6189385** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000250	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000250	0.000500								U

LCS Sample ID: **LCS-210719** Units: **mg/L** Analysis Date: **19-Jul-2021 10:02**
Client ID: Run ID: **FID-4_387750** SeqNo: **6189386** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0181	0.00100	0.01804	0	101	75 - 125				
Ethene	0.0138	0.00100	0.0168	0	81.8	75 - 125				
Methane	0.00898	0.000500	0.009647	0	93.1	75 - 125				

MS Sample ID: **HS21070486-02MS** Units: **mg/L** Analysis Date: **19-Jul-2021 14:06**
Client ID: Run ID: **FID-4_387750** SeqNo: **6189395** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0161	0.00100	0.01804	0	89.3	75 - 125				
Ethene	0.0153	0.00100	0.0168	0	91.2	75 - 125				
Methane	0.896	0.000500	0.009647	0.9305	-358	75 - 125				SEO

MSD Sample ID: **HS21070486-02MSD** Units: **mg/L** Analysis Date: **19-Jul-2021 14:21**
Client ID: Run ID: **FID-4_387750** SeqNo: **6189396** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0133	0.00100	0.01804	0	73.6	75 - 125	0.01611	19.3	30	S
Ethene	0.0138	0.00100	0.0168	0	82.2	75 - 125	0.01532	10.4	30	
Methane	0.920	0.000500	0.009647	0.9305	-108	75 - 125	0.8960	2.66	30	SEO

The following samples were analyzed in this batch: HS21070744-01 HS21070744-02 HS21070744-03 HS21070744-04 HS21070744-05

Revision: 1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070744

QC BATCH REPORT

Batch ID: R387950 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210721** Units: **ug/L** Analysis Date: **21-Jul-2021 12:26**
Client ID: Run ID: **VOA6_387950** SeqNo: **6194026** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*55.52*	*1.0*	*50*	*0*	*111*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.38*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*55.56*	*1.0*	*50*	*0*	*111*	*80 - 119*				
Surr: Toluene-d8	*53.62*	*1.0*	*50*	*0*	*107*	*89 - 112*				

LCS Sample ID: **VLCSW-210721** Units: **ug/L** Analysis Date: **21-Jul-2021 11:44**
Client ID: Run ID: **VOA6_387950** SeqNo: **6194025** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.12	1.0	20	0	95.6	80 - 119				
1,1-Dichloroethene	22.43	1.0	20	0	112	71 - 131				
1,2-Dichloroethane	19.39	1.0	20	0	96.9	73 - 128				
cis-1,2-Dichloroethene	21.74	1.0	20	0	109	78 - 123				
Methylene chloride	20.83	2.0	20	0	104	74 - 124				
Trichloroethene	19.42	1.0	20	0	97.1	79 - 123				
Vinyl chloride	17.41	1.0	20	0	87.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*58.08*	*1.0*	*50*	*0*	*116*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.17*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*58.51*	*1.0*	*50*	*0*	*117*	*80 - 119*				
Surr: Toluene-d8	*48.65*	*1.0*	*50*	*0*	*97.3*	*89 - 112*				

Revision: 1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070744

QC BATCH REPORT

Batch ID: R387950 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21070667-01MS** Units: **ug/L** Analysis Date: **21-Jul-2021 14:54**
Client ID: Run ID: **VOA6_387950** SeqNo: **6194033** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.59	1.0	20	0	87.9	80 - 119				
1,1-Dichloroethene	20.96	1.0	20	0	105	71 - 131				
1,2-Dichloroethane	16.8	1.0	20	0	84.0	73 - 128				
cis-1,2-Dichloroethene	26.87	1.0	20	0	134	78 - 123				S
Methylene chloride	18.22	2.0	20	0	91.1	74 - 124				
Trichloroethene	21.48	1.0	20	0	107	79 - 123				
Vinyl chloride	15.25	1.0	20	0	76.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*55.16*	*1.0*	*50*	*0*	*110*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.04*	*1.0*	*50*	*0*	*100*	*85 - 114*				
Surr: Dibromofluoromethane	*55.59*	*1.0*	*50*	*0*	*111*	*80 - 119*				
Surr: Toluene-d8	*52.17*	*1.0*	*50*	*0*	*104*	*89 - 112*				

MSD Sample ID: **HS21070667-01MSD** Units: **ug/L** Analysis Date: **21-Jul-2021 15:15**
Client ID: Run ID: **VOA6_387950** SeqNo: **6194034** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.24	1.0	20	0	91.2	80 - 119	17.59	3.62	20	
1,1-Dichloroethene	19.99	1.0	20	0	99.9	71 - 131	20.96	4.76	20	
1,2-Dichloroethane	16.72	1.0	20	0	83.6	73 - 128	16.8	0.49	20	
cis-1,2-Dichloroethene	20.03	1.0	20	0	100	78 - 123	26.87	29.2	20	R
Methylene chloride	17.73	2.0	20	0	88.6	74 - 124	18.22	2.72	20	
Trichloroethene	18.78	1.0	20	0	93.9	79 - 123	21.48	13.4	20	
Vinyl chloride	14.2	1.0	20	0	71.0	58 - 137	15.25	7.13	20	
Surr: 1,2-Dichloroethane-d4	*57.05*	*1.0*	*50*	*0*	*114*	*81 - 118*	*55.16*	*3.37*	*20*	
Surr: 4-Bromofluorobenzene	*50.2*	*1.0*	*50*	*0*	*100*	*85 - 114*	*50.04*	*0.309*	*20*	
Surr: Dibromofluoromethane	*54.28*	*1.0*	*50*	*0*	*109*	*80 - 119*	*55.59*	*2.38*	*20*	
Surr: Toluene-d8	*52.52*	*1.0*	*50*	*0*	*105*	*89 - 112*	*52.17*	*0.679*	*20*	

The following samples were analyzed in this batch: HS21070744-02 HS21070744-05

Revision: 1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070744

QC BATCH REPORT

Batch ID: R388080 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210722** Units: **ug/L** Analysis Date: **22-Jul-2021 12:07**
Client ID: Run ID: **VOA6_388080** SeqNo: **6196594** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*58.99*	*1.0*	*50*	*0*	*118*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.28*	*1.0*	*50*	*0*	*98.6*	*85 - 114*				
Surr: Dibromofluoromethane	*56.59*	*1.0*	*50*	*0*	*113*	*80 - 119*				
Surr: Toluene-d8	*53.76*	*1.0*	*50*	*0*	*108*	*89 - 112*				

LCS Sample ID: **VLCSW-210722** Units: **ug/L** Analysis Date: **22-Jul-2021 11:25**
Client ID: Run ID: **VOA6_388080** SeqNo: **6196593** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.24	1.0	20	0	91.2	80 - 119				
1,1-Dichloroethene	19.92	1.0	20	0	99.6	71 - 131				
1,2-Dichloroethane	19.46	1.0	20	0	97.3	73 - 128				
cis-1,2-Dichloroethene	21.33	1.0	20	0	107	78 - 123				
Methylene chloride	20.74	2.0	20	0	104	74 - 124				
Trichloroethene	16.88	1.0	20	0	84.4	79 - 123				
Vinyl chloride	15.36	1.0	20	0	76.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*54.65*	*1.0*	*50*	*0*	*109*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*44.78*	*1.0*	*50*	*0*	*89.6*	*85 - 114*				
Surr: Dibromofluoromethane	*52.97*	*1.0*	*50*	*0*	*106*	*80 - 119*				
Surr: Toluene-d8	*44.52*	*1.0*	*50*	*0*	*89.0*	*89 - 112*				

Revision: 1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070744

QC BATCH REPORT

Batch ID: R388080 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21070791-06MS** Units: **ug/L** Analysis Date: **22-Jul-2021 15:38**
Client ID: Run ID: **VOA6_388080** SeqNo: **6196604** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.14	1.0	20	0	90.7	80 - 119				
1,1-Dichloroethene	21.98	1.0	20	0	110	71 - 131				
1,2-Dichloroethane	17.03	1.0	20	0	85.1	73 - 128				
cis-1,2-Dichloroethene	27.08	1.0	20	0	135	78 - 123				S
Methylene chloride	18.81	2.0	20	0	94.0	74 - 124				
Trichloroethene	26.06	1.0	20	3.875	111	79 - 123				
Vinyl chloride	14.85	1.0	20	0	74.3	58 - 137				
Surr: 1,2-Dichloroethane-d4	*61.67*	*1.0*	*50*	*0*	*123*	*81 - 118*				S
Surr: 4-Bromofluorobenzene	*51.88*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*58.3*	*1.0*	*50*	*0*	*117*	*80 - 119*				
Surr: Toluene-d8	*51.73*	*1.0*	*50*	*0*	*103*	*89 - 112*				

MSD Sample ID: **HS21070791-06MSD** Units: **ug/L** Analysis Date: **22-Jul-2021 15:59**
Client ID: Run ID: **VOA6_388080** SeqNo: **6196605** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.82	1.0	20	0	89.1	80 - 119	18.14	1.75	20	
1,1-Dichloroethene	21.25	1.0	20	0	106	71 - 131	21.98	3.39	20	
1,2-Dichloroethane	17.32	1.0	20	0	86.6	73 - 128	17.03	1.72	20	
cis-1,2-Dichloroethene	20.67	1.0	20	0	103	78 - 123	27.08	26.8	20	R
Methylene chloride	18.38	2.0	20	0	91.9	74 - 124	18.81	2.33	20	
Trichloroethene	22.43	1.0	20	3.875	92.8	79 - 123	26.06	15	20	
Vinyl chloride	14.21	1.0	20	0	71.1	58 - 137	14.85	4.43	20	
Surr: 1,2-Dichloroethane-d4	*59.83*	*1.0*	*50*	*0*	*120*	*81 - 118*	*61.67*	*3.04*	*20*	S
Surr: 4-Bromofluorobenzene	*50.17*	*1.0*	*50*	*0*	*100*	*85 - 114*	*51.88*	*3.35*	*20*	
Surr: Dibromofluoromethane	*57.92*	*1.0*	*50*	*0*	*116*	*80 - 119*	*58.3*	*0.649*	*20*	
Surr: Toluene-d8	*51.46*	*1.0*	*50*	*0*	*103*	*89 - 112*	*51.73*	*0.516*	*20*	

The following samples were analyzed in this batch: HS21070744-01 HS21070744-03 HS21070744-04 HS21070744-06 HS21070744-07 HS21070744-08 HS21070744-09

Revision: 1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070744

QC BATCH REPORT

Batch ID: R387568 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **15-Jul-2021 21:16**
Client ID: Run ID: **ICS-Integrion_387568** SeqNo: **6185583** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS** Units: **mg/L** Analysis Date: **15-Jul-2021 21:23**
Client ID: Run ID: **ICS-Integrion_387568** SeqNo: **6185584** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	4.329	0.100	4	0	108	80 - 120				
Nitrogen, Nitrate (As N)	4.228	0.100	4	0	106	80 - 120				
Sulfate	21.25	0.500	20	0	106	80 - 120				

MS Sample ID: **HS21070744-01MS** Units: **mg/L** Analysis Date: **15-Jul-2021 16:57**
Client ID: **16WW58-210714** Run ID: **ICS-Integrion_387568** SeqNo: **6185565** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	4.411	0.100	2	2.3	106	80 - 120				
Nitrogen, Nitrate (As N)	2.048	0.100	2	0.0059	102	80 - 120				
Sulfate	165	0.500	10	153.6	114	80 - 120				EO

MSD Sample ID: **HS21070744-01MSD** Units: **mg/L** Analysis Date: **15-Jul-2021 17:04**
Client ID: **16WW58-210714** Run ID: **ICS-Integrion_387568** SeqNo: **6185566** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	4.333	0.100	2	2.3	102	80 - 120	4.411	1.78	20	
Nitrogen, Nitrate (As N)	2.017	0.100	2	0.0059	101	80 - 120	2.048	1.55	20	
Sulfate	161.8	0.500	10	153.6	82.7	80 - 120	165	1.94	20	EO

The following samples were analyzed in this batch: HS21070744-01 HS21070744-02 HS21070744-03 HS21070744-04 HS21070744-05

Revision: 1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070744

QC BATCH REPORT

Batch ID: R387706 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **16-Jul-2021 09:24**
Client ID: Run ID: **ICS-Integrion_387706** SeqNo: **6188400** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS** Units: **mg/L** Analysis Date: **16-Jul-2021 09:31**
Client ID: Run ID: **ICS-Integrion_387706** SeqNo: **6188401** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	20.94	0.500	20	0	105	80 - 120				

MS Sample ID: **HS21070835-04MS** Units: **mg/L** Analysis Date: **16-Jul-2021 13:23**
Client ID: Run ID: **ICS-Integrion_387706** SeqNo: **6188407** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	201.7	2.50	50	159.5	84.4	80 - 120				

MSD Sample ID: **HS21070835-04MSD** Units: **mg/L** Analysis Date: **16-Jul-2021 13:31**
Client ID: Run ID: **ICS-Integrion_387706** SeqNo: **6188408** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	202.6	2.50	50	159.5	86.3	80 - 120	201.7	0.451	20	

The following samples were analyzed in this batch: HS21070744-01 HS21070744-02 HS21070744-03 HS21070744-04

Revision: 1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070744

QC BATCH REPORT

Batch ID: R388042 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM 2320B-2011**

MBLK Sample ID: **WBLKW2-210722** Units: **mg/L** Analysis Date: **22-Jul-2021 23:56**
Client ID: Run ID: **ManTech01_388042** SeqNo: **6195859** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **WLCS2-210722** Units: **mg/L** Analysis Date: **22-Jul-2021 23:35**
Client ID: Run ID: **ManTech01_388042** SeqNo: **6195856** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1050	5.00	1000	0	105	85 - 115				

LCSD Sample ID: **WLCSD2-210722** Units: **mg/L** Analysis Date: **23-Jul-2021 00:05**
Client ID: Run ID: **ManTech01_388042** SeqNo: **6195860** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1029	5.00	1000	0	103	85 - 115	1050	2.06	20	

DUP Sample ID: **HS21071038-02DUP** Units: **mg/L** Analysis Date: **23-Jul-2021 00:16**
Client ID: Run ID: **ManTech01_388042** SeqNo: **6195862** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	185.2	5.00					168.1	9.66	20	

The following samples were analyzed in this batch: HS21070744-01 HS21070744-02 HS21070744-03 HS21070744-04 HS21070744-05

Revision: 1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070744

QC BATCH REPORT

Batch ID: R388440 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B-2011**

MBLK Sample ID: **MBLK-07282021** Units: **mg/L** Analysis Date: **28-Jul-2021 20:04**
Client ID: Run ID: **TOC_04_388440** SeqNo: **6205068** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **LCS-07282021** Units: **mg/L** Analysis Date: **28-Jul-2021 20:16**
Client ID: Run ID: **TOC_04_388440** SeqNo: **6205069** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	11.12	1.00	10	0	111	85 - 115				

LCSD Sample ID: **LCSD-07282021** Units: **mg/L** Analysis Date: **28-Jul-2021 20:28**
Client ID: Run ID: **TOC_04_388440** SeqNo: **6205070** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.71	1.00	10	0	107	85 - 115	11.12	3.76	20	

MS Sample ID: **HS21071443-01MS** Units: **mg/L** Analysis Date: **28-Jul-2021 21:03**
Client ID: Run ID: **TOC_04_388440** SeqNo: **6205072** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	23.27	1.00	10	11.87	114	80 - 120				

The following samples were analyzed in this batch: HS21070744-01

Revision: 1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21070744

QC BATCH REPORT

Batch ID: R388527 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B-2011**

MBLK Sample ID: **MBLK-07292021** Units: **mg/L** Analysis Date: **29-Jul-2021 11:54**
Client ID: Run ID: **TOC_04_388527** SeqNo: **6206865** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **LCS-07292021** Units: **mg/L** Analysis Date: **29-Jul-2021 12:06**
Client ID: Run ID: **TOC_04_388527** SeqNo: **6206866** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.76	1.00	10	0	108	85 - 115				

LCSD Sample ID: **LCSD-07292021** Units: **mg/L** Analysis Date: **29-Jul-2021 12:21**
Client ID: Run ID: **TOC_04_388527** SeqNo: **6206867** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.54	1.00	10	0	105	85 - 115	10.76	2.07	20	

MS Sample ID: **HS21070786-06MS** Units: **mg/L** Analysis Date: **29-Jul-2021 13:52**
Client ID: Run ID: **TOC_04_388527** SeqNo: **6206874** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	12.3	1.00	10	1.431	109	80 - 120				

The following samples were analyzed in this batch: HS21070744-02 HS21070744-03 HS21070744-04 HS21070744-05

Revision: 1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: **HS21070744**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	21-022-0	26-Mar-2022
Dept of Defense	PJLA L20-507-R2	22-Dec-2021
Florida	E87611-33	30-Jun-2022
Illinois	2000322021-7	09-May-2022
Kansas	E-10352 2021-2022	31-Jul-2022
Kentucky	123043, 2021-2022	30-Apr-2022
Louisiana	03087, 2021-2022	30-Jun-2022
North Carolina	624-2021	31-Dec-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-21-27	30-Apr-2022

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21070744

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS21070744-01	16WW58-210714	Login	7/15/2021 11:40:24 AM	PJM	WET027
HS21070744-01	16WW58-210714	Login	7/15/2021 11:40:24 AM	PJM	Sub
HS21070744-01	16WW58-210714	Login	7/15/2021 11:40:24 AM	PJM	B038
HS21070744-01	16WW58-210714	Login	7/15/2021 11:40:24 AM	PJM	RSK014
HS21070744-01	16WW58-210714	Login	7/15/2021 11:40:24 AM	PJM	WET238
HS21070744-02	16WW57-210714	Login	7/15/2021 11:40:24 AM	PJM	WET027
HS21070744-02	16WW57-210714	Login	7/15/2021 11:40:24 AM	PJM	Sub
HS21070744-02	16WW57-210714	Login	7/15/2021 11:40:24 AM	PJM	B038
HS21070744-02	16WW57-210714	Login	7/15/2021 11:40:24 AM	PJM	RSK014
HS21070744-02	16WW57-210714	Login	7/15/2021 11:40:24 AM	PJM	WET238
HS21070744-03	16WW35-210714	Login	7/15/2021 11:40:24 AM	PJM	WET027
HS21070744-03	16WW35-210714	Login	7/15/2021 11:40:24 AM	PJM	Sub
HS21070744-03	16WW35-210714	Login	7/15/2021 11:40:24 AM	PJM	B038
HS21070744-03	16WW35-210714	Login	7/15/2021 11:40:24 AM	PJM	RSK014
HS21070744-03	16WW35-210714	Login	7/15/2021 11:40:24 AM	PJM	WET238
HS21070744-04	16WW36-210714	Login	7/15/2021 11:40:24 AM	PJM	WET027
HS21070744-04	16WW36-210714	Login	7/15/2021 11:40:24 AM	PJM	Sub
HS21070744-04	16WW36-210714	Login	7/15/2021 11:40:24 AM	PJM	B038
HS21070744-04	16WW36-210714	Login	7/15/2021 11:40:24 AM	PJM	RSK014
HS21070744-04	16WW36-210714	Login	7/15/2021 11:40:24 AM	PJM	WET238
HS21070744-05	16IW09-210714	Login	7/15/2021 11:40:24 AM	PJM	WET027
HS21070744-05	16IW09-210714	Login	7/15/2021 11:40:24 AM	PJM	Sub
HS21070744-05	16IW09-210714	Login	7/15/2021 11:40:24 AM	PJM	B038
HS21070744-05	16IW09-210714	Login	7/15/2021 11:40:24 AM	PJM	RSK014
HS21070744-05	16IW09-210714	Login	7/15/2021 11:40:24 AM	PJM	WET238
HS21070744-06	16RW05-210714	Login	7/15/2021 11:40:24 AM	PJM	WET027
HS21070744-06	16RW05-210714	Login	7/15/2021 11:40:24 AM	PJM	Sub
HS21070744-06	16RW05-210714	Login	7/15/2021 11:40:24 AM	PJM	B038
HS21070744-06	16RW05-210714	Login	7/15/2021 11:40:24 AM	PJM	RSK014
HS21070744-06	16RW05-210714	Login	7/15/2021 11:40:24 AM	PJM	WET238
HS21070744-07	16WW23-210714	Login	7/15/2021 11:40:24 AM	PJM	Sub
HS21070744-07	16WW23-210714	Login	7/15/2021 11:40:24 AM	PJM	B038
HS21070744-08	16WW24-210714	Login	7/15/2021 11:40:24 AM	PJM	Sub
HS21070744-08	16WW24-210714	Login	7/15/2021 11:40:24 AM	PJM	B038
HS21070744-09	Trip Blank-210714	Login	7/15/2021 11:40:24 AM	PJM	B038

Revision:1

ALS Houston, US Date: 10-Aug-21

Sample Receipt Checklist

Work Order ID: HS21070744 **Date/Time Received:** **15-Jul-2021 09:25**

Client Name: CBI-Houston **Received by:** **Paresh M. Giga**

Completed By: */S/ Pablo Marinez* 15-Jul-2021 11:42 **Reviewed by:** */S/ Ragen Giga* 15-Jul-2021 21:26

eSignature / Date/Time — eSignature / Date/Time

Matrices: **WATER** Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:CLIENT
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.4°C UC/C	IR 31
Cooler(s)/Kit(s):	46395	
Date/Time sample(s) sent to storage:	7/15/21 12:00	

Water - VOA vials have zero headspace?	Yes ☐	No ☑	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes: 16IW09-210714
VOC 1 of 3 vials & RSK 2 of 3 vials
contains >6mm headspace

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

HS21070744

Aptim Environmental & Infrastucture, Inc.

ghorn Army Ammunition Plant LHAAP 16 July 2021

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX, 77099 (281) 530-5656 ATTN: RJ Medanha

REVISED 8/31/2021

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 501032
Job: **LHAAP 16 July 2021**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6860	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16ww58-210714	wG	7/14/21/0700		10	X	X	X	X	X	X						
16ww57-210714	wG	7/14/21/0745		10	X	X	X	X	X	X						
16ww35-210714	wG	7/14/21/0845		10	X	X	X	X	X	X						
16ww36-210714	wG	7/14/21/0930		10	X	X	X	X	X	X						
16Two9-210714	wG	7/14/21/1015		10	X	X	X	X	X	X						
16Rw05-210714 SB 8/10/21	wG	7/14/21/1100		4	X					X						
16Rw23-210714	wG	7/14/21/1145		4	X					X						
16ww24-210714	wG	7/14/21/1230		4	X					X						

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	7/14/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

HS21070744

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant LHAAP 16 July 20

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: RJ Modashia

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 501032
Job: **LHAAP 16 July 2021**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D.	Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16WW58-210714		WG	7/14/21/ 0700		10	X	X	X	X	X	X						
16WW57-210714		WG	7/14/21/ 0745		10	X	X	X	X	X	X						
16WW35-210714		WG	7/14/21/ 0845		10	X	X	X	X	X	X						
16WW36-210714		WG	7/14/21/ 0930		10	X	X	X	X	X	X						
16IW09-210714		WG	7/14/21/ 1015		10	X	X	X	X	X	X						
16RW09-210714		WG	7/14/21/ 1100		4	X					X						
16RW23-210714		WG	7/14/21/ 1145		4	X					X						
16WW24-210714		WG	7/14/21/ 1230		4	X					X						

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	7/14/21	1430		7/15/21	09:25						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
	0715								

Remarks:
4639; 1.40
+31
CIF-oc

HS21070744

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant LHAAP 16 July 20

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: RJ Modashia

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 501032
Job: **LHAAP 16 July 2021**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
TRip Blank-210714	W	7/14/21		2	X											

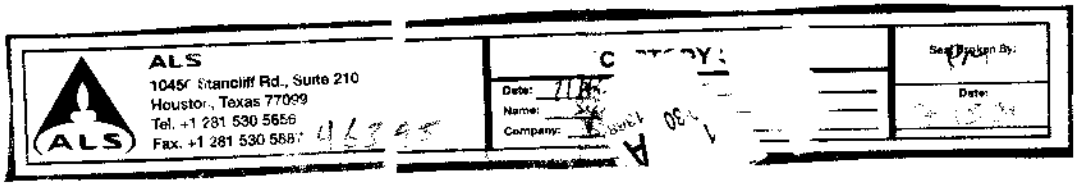
Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

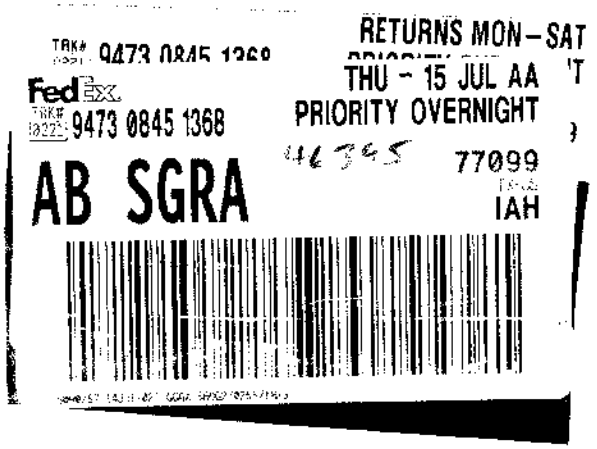
Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	7/14/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
	7/15/2021	9:25							

Remarks:


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
46395
Date:
Name:
Company:
Sent Packed By:
Date:


TRK# 9473 0845 1368
FedEx
TRK# 9473 0845 1368
RETURNS MON-SAT
THU - 15 JUL AA
PRIORITY OVERNIGHT
46395
77099
IAH
AB SGRA

August 9, 2021 Service Request No:E2100798

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

Laboratory Results for: HS21070744

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory July 15, 2021
For your reference, these analyses have been assigned our service request number **E2100798.**

Revision I - Sample ID 16RW09-210714 was corrected at the request of the client to 16RW05-210714.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100798
Project:	HS21070744	**Date Received:**	07/15/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Eight samples were received for analysis at ALS Environmental in Houston on 07/15/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100448: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for these extraction batches. The LCS and DLCS recoveries are within QC limits.

Multiple dilutions were attempted until passing Internal Standard ranges were achieved. Carbon cleanup was also performed to reduce organic interference in samples E2100798-001/002/004/005/006/007/008.

DoD certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2100798
Project: HS21070744

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100798-001	16WW58-210714	7/14/2021	0700
E2100798-002	16WW57-210714	7/14/2021	0745
E2100798-003	16WW35-210714	7/14/2021	0845
E2100798-004	16WW36-210714	7/14/2021	0930
E2100798-005	16IW09-210714	7/14/2021	1015
E2100798-006	16RW05-210714	7/14/2021	1100
E2100798-007	16WW23-210714	7/14/2021	1145
E2100798-008	16WW24-210714	7/14/2021	1230

Service Request Summary

Folder #: **E2100798**
Client Name: ALS Environmental - US
Project Name: HS21070744
Project Number:

Report To: Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 07/15/21
Internal Due Date: 7/29/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21070744
EDD: No EDD Specified

8 125 mL-Plastic Bottle Plastic
Location: EHRMS-AirArch 1
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100798-001	16WW58-210714	Ground Water	07/14/21 0700	**IV**
E2100798-002	16WW57-210714	Ground Water	07/14/21 0745	**IV**
E2100798-003	16WW35-210714	Ground Water	07/14/21 0845	**IV**
E2100798-004	16WW36-210714	Ground Water	07/14/21 0930	**IV**
E2100798-005	16IW09-210714	Ground Water	07/14/21 1015	**IV**
E2100798-006	16RW05-210714	Ground Water	07/14/21 1100	**IV**
E2100798-007	16WW23-210714	Ground Water	07/14/21 1145	**IV**
E2100798-008	16WW24-210714	Ground Water	07/14/21 1230	**IV**

Service Request Summary

Folder #: **E2100798**
Client Name: ALS Environmental - US
Project Name: HS21070744
Project Number:

Report To: Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 07/15/21
Internal Due Date: 7/29/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21070744
EDD: No EDD Specified

8 125 mL-Plastic Bottle Plastic
Location: EHRMS-AirArch 1
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	8	Level II due 7/29,IV due 8/5

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arkansas Department of Environmental Quality	19-028-0	6/30/2022
Arkansas Department of Environmental Quality	21-022-0	3/26/2022
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-33	6/30/2022
Hawaii Department of Health	2021-2022	4/30/2022
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Kansas Department of Health and Environment	E-10352 2022	7/31/2022
Louisiana Department of Environmental Quality	03087-2021	6/30/2022
Louisiana Department of Health and Hospitals	LA028-2021	12/31/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Minnesota Department of Health	2021671	12/31/2021
Nevada Department of Concervation and Natural Resources	TX026932021-4	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209421	4/24/2022
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	68-03441-015	6/30/2022
Tennessee Department of Environment and Concervation	04016-2021	4/30/2022
Texas Commision on Environmental Quality	T104704231-21-27	4/30/2022
United States Department of Agriculture	P330-19-00299	10/10/2022
Utah Department of Health Environmental Laboratory Certification	TX026932021-10	7/31/2021

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 16496**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	Ragen Giga
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RagenP.Giga@ALSGlobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS21070744
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21070744-01**	**16WW58-210714**	**GW**	**14 Jul 2021 07:00**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			29 Jul 2021
2.	**HS21070744-02**	**16WW57-210714**	**GW**	**14 Jul 2021 07:45**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			29 Jul 2021
3.	**HS21070744-03**	**16WW35-210714**	**GW**	**14 Jul 2021 08:45**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			29 Jul 2021
4.	**HS21070744-04**	**16WW36-210714**	**GW**	**14 Jul 2021 09:30**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			29 Jul 2021
5.	**HS21070744-05**	**16IW09-210714**	**GW**	**14 Jul 2021 10:15**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			29 Jul 2021
6.	**HS21070744-06**	**16RW09-210714**	**GW**	**14 Jul 2021 11:00**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			29 Jul 2021
7.	**HS21070744-07**	**16WW23-210714**	**GW**	**14 Jul 2021 11:45**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			29 Jul 2021
8.	**HS21070744-08**	**16WW24-210714**	**GW**	**14 Jul 2021 12:30**

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 16496**

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			29 Jul 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: _____

Received By: CORE7 4 Date/Time: 7/15/21 1315

Cooler ID(s): _____ Temperature(s): _____

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 383582 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 7/20/21 15:35

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100798-001	16WW58-210714	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2100798-002	16WW57-210714	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2100798-003	16WW35-210714	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2100798-004	16WW36-210714	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100798-005	16IW09-210714	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100798-006	16RW05-210714	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100798-007	16WW23-210714	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2100798-008	16WW24-210714	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2100804-001	MOSA-21-231364	.01	6850/ClO4 DOD			Water	10mL	
10	E2100804-002	MOSA-21-231365	.01	6850/ClO4 DOD			Water	10mL	
11	E2100804-003	MOSA-21-231407	.01	6850/ClO4 DOD			Water	10mL	
12	E2100804-004	MOSA-21-231366	.01	6850/ClO4 DOD			Water	10mL	
13	E2100804-005	MOSA-21-231412	.01	6850/ClO4 DOD			Water	10mL	
14	E2100804-006	MOSA-21-231367	.01	6850/ClO4 DOD			Water	10mL	
15	EQ2100448-01	MB		6850/ClO4 DOD			Liquid	10mL	
16	EQ2100448-02	LCS		6850/ClO4 DOD			Liquid	10mL	
17	EQ2100448-03	DLCS		6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 214765 Logbook Ref: Sodium Perchlorate Expires On: 12/11/2022

E2100798-001	100.00µL	E2100798-002	100.00µL	E2100798-003	100.00µL	E2100798-004	100.00µL	E2100798-005	100.00µL	E2100798-006	100.00µL
E2100798-007	100.00µL	E2100798-008	100.00µL	E2100804-001	100.00µL	E2100804-002	100.00µL	E2100804-003	100.00µL	E2100804-004	100.00µL
E2100804-005	100.00µL	E2100804-006	100.00µL	EQ2100448-01	100.00µL	EQ2100448-02	100.00µL	EQ2100448-03	100.00µL		

Name: Perchlorate Intermediate Stock1 Inventory ID 217422 Logbook Ref: Perchlorate Expires On: 11/26/2021

EQ2100448-02	1.00µL	EQ2100448-03	1.00µL

Preparation Materials

Water HPLC Grade	07/01/2021 Water (217918)	537M Glass Culture Tubes	537M Glass Tubes (218064)

Preparation Information Benchsheet

Prep Run#: 383582 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 7/20/21 15:35

Preparation Steps

Step: Preparation
Started: 7/20/21 15:35
Finished: 7/20/21 16:30
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 7/20/21

Chain of Custody

Relinquished By:		Date:		Extracts Examined
Received By:		Date:		Yes No

Analytical Results

ALS Environmental - Houston HRMS
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ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100798
Project:	HS21070744	**Date Collected:**	7/14/21 0700
Sample Matrix:	Ground Water	**Date Received:**	7/15/21
Sample Name:	16WW58-210714	**Units:**	µg/L
Lab Code:	E2100798-001	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	2.00	1.00	0.500	20	7/20/21	7/27/21 18:36	383582	732749	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100798
Project:	HS21070744	**Date Collected:**	7/14/21 0745
Sample Matrix:	Ground Water	**Date Received:**	7/15/21
Sample Name:	16WW57-210714	**Units:**	µg/L
Lab Code:	E2100798-002	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	7/20/21	7/27/21 18:44	383582	732749	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100798
Project:	HS21070744	**Date Collected:**	7/14/21 0845
Sample Matrix:	Ground Water	**Date Received:**	7/15/21
Sample Name:	16WW35-210714	**Units:**	µg/L
Lab Code:	E2100798-003	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**352**		4.00	2.00	1.00	40	7/20/21	7/27/21 18:53	383582	732749	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100798
Project:	HS21070744	**Date Collected:**	7/14/21 0930
Sample Matrix:	Ground Water	**Date Received:**	7/15/21
Sample Name:	16WW36-210714	**Units:**	µg/L
Lab Code:	E2100798-004	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.438**	J	1.00	0.500	0.250	10	7/20/21	7/27/21 19:01	383582	732749	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100798
Project:	HS21070744	**Date Collected:**	7/14/21 1015
Sample Matrix:	Ground Water	**Date Received:**	7/15/21
Sample Name:	16IW09-210714	**Units:**	µg/L
Lab Code:	E2100798-005	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	2.00	1.00	0.500	20	7/20/21	7/29/21 17:20	383582	733209	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100798
Project:	HS21070744	**Date Collected:**	7/14/21 1100
Sample Matrix:	Ground Water	**Date Received:**	7/15/21
Sample Name:	16RW05-210714	**Units:**	µg/L
Lab Code:	E2100798-006	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	4.00	2.00	1.00	40	7/20/21	7/30/21 15:21	383582	733225	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100798
Project:	HS21070744	**Date Collected:**	7/14/21 1145
Sample Matrix:	Ground Water	**Date Received:**	7/15/21
Sample Name:	16WW23-210714	**Units:**	µg/L
Lab Code:	E2100798-007	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	4.00	2.00	1.00	40	7/20/21	7/30/21 16:06	383582	733225	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100798
Project:	HS21070744	**Date Collected:**	7/14/21 1230
Sample Matrix:	Ground Water	**Date Received:**	7/15/21
Sample Name:	16WW24-210714	**Units:**	µg/L
Lab Code:	E2100798-008	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	7/20/21	7/27/21 19:35	383582	732749	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100798
Project:	HS21070744	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100448-01	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	7/20/21	7/21/21 14:42	383582	732081	

Accuracy & Precision

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ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100798
Project:	HS21070744	**Date Analyzed:**	7/21/21
Sample Matrix:	Ground Water		

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	As Received
		Extraction Lot:	383582

	Lab Control Sample EQ2100448-02			Duplicate Lab Control Sample EQ2100448-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0904	0.100	90	0.105	0.100	105	84 - 119	15	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100798
Project:	HS21070744	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100448-02	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0904**	J	0.100	0.0500	0.0250	1	7/20/21	7/21/21 14:50	383582	732081	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100798
Project:	HS21070744	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100448-03	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.105**		0.100	0.0500	0.0250	1	7/20/21	7/21/21 14:59	383582	732081	

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August 04, 2021

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
10333 Richmond Ave
Ste 1030
Houston, TX 77042

Work Order: **HS21071038**

Laboratory Results for: **Longhorn Army Ammunition Plant LHAAP 16 July 2021**

Dear Vicki Graves ,

ALS Environmental received 10 sample(s) on Jul 21, 2021 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Ragen Giga
Project Manager

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21071038

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21071038-01	16WW16-210720	GW		20-Jul-2021 07:35	21-Jul-2021 09:05	☐
HS21071038-02	16WW56-210720	GW		20-Jul-2021 07:55	21-Jul-2021 09:05	☐
HS21071038-03	16WW22-210720	GW		20-Jul-2021 08:50	21-Jul-2021 09:05	☐
HS21071038-04	16WW41-210720	GW		20-Jul-2021 09:40	21-Jul-2021 09:05	☐
HS21071038-05	16WW21-210720	GW		20-Jul-2021 10:30	21-Jul-2021 09:05	☐
HS21071038-06	16WW29-210720	GW		20-Jul-2021 11:20	21-Jul-2021 09:05	☐
HS21071038-07	16WW29-210720-FD	GW		20-Jul-2021 11:20	21-Jul-2021 09:05	☐
HS21071038-08	16WW30-210720	GW		20-Jul-2021 12:15	21-Jul-2021 09:05	☐
HS21071038-09	16WW51-210720	GW		20-Jul-2021 13:05	21-Jul-2021 09:05	☐
HS21071038-10	Trip Blank-210720	Water	CG-061121-110	20-Jul-2021 00:00	21-Jul-2021 09:05	☐

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21071038

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston Specialty Lab. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R388610

Sample ID: 16WW56-210720 (HS21071038-02MS)

- The recovery of the Matrix Spike (MS) and/or Matrix Spike Duplicate (MSD) associated with this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS/MSD may be due to sample matrix interference. (Methane)

Sample ID: HS21071204-02MS

- MS and MSD are for an unrelated sample

GCMS Volatiles by Method SW8260

Batch ID: R388373

Sample ID: 16WW29-210720-FD (HS21071038-07)

- urrogate Toluene-d8 exceeded recovery limits. Sample is ND.

Batch ID: R388302

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM5310B

Batch ID: R388670

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Batch ID: R388834

Sample ID: HS21071079-32MS

- MS is for an unrelated sample

WetChemistry by Method SM2320B

Batch ID: R388042

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21071038

WetChemistry by Method SW9056

Batch ID: R387951

Sample ID: 16WW16-210720 (HS21071038-01)

• Sample ran at 2X due to high concentration of Chloride

Sample ID: 16WW22-210720 (HS21071038-03)

• Sample ran at 2X due to high concentration of Chloride

Sample ID: 16WW29-210720 (HS21071038-06)

• Sample ran at 5X due to high concentration of Sulfate

Sample ID: 16WW29-210720-FD (HS21071038-07)

• Sample ran at 5X due to high concentration of Sulfate

Sample ID: 16WW41-210720 (HS21071038-04)

• Sample ran at 10X due to high concentration of Sulfate

Sample ID: 16WW56-210720 (HS21071038-02)

• Sample ran at 2X due to high concentration of Chloride

Batch ID: R388098

Sample ID: HS21071128-04MS

• MS and MSD are for an unrelated sample (Sulfate)

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071038
Sample ID: 16WW16-210720 Lab ID:HS21071038-01
Collection Date: 20-Jul-2021 07:35 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	25	U	7.5	25	25	ug/L	25	27-Jul-2021 14:54
1,1-Dichloroethene	**29**		**5.0**	**12**	**25**	**ug/L**	25	27-Jul-2021 14:54
1,2-Dichloroethane	**33**		**5.0**	**12**	**25**	**ug/L**	25	27-Jul-2021 14:54
cis-1,2-Dichloroethene	**15,000**		**50**	**120**	**250**	**ug/L**	250	27-Jul-2021 16:39
Methylene chloride	**35**	J	**10**	**25**	**50**	**ug/L**	25	27-Jul-2021 14:54
Trichloroethene	**30,000**		**50**	**120**	**250**	**ug/L**	250	27-Jul-2021 16:39
Vinyl chloride	**170**		**5.0**	**12**	**25**	**ug/L**	25	27-Jul-2021 14:54
Surr: 1,2-Dichloroethane-d4	*92.0*			**0**	*81-118*	*%REC*	*25*	*27-Jul-2021 14:54*
Surr: 1,2-Dichloroethane-d4	*94.5*			**0**	*81-118*	*%REC*	*250*	*27-Jul-2021 16:39*
Surr: 4-Bromofluorobenzene	*90.6*			**0**	*85-114*	*%REC*	*25*	*27-Jul-2021 14:54*
Surr: 4-Bromofluorobenzene	*93.4*			**0**	*85-114*	*%REC*	*250*	*27-Jul-2021 16:39*
Surr: Dibromofluoromethane	*97.8*			**0**	*80-119*	*%REC*	*250*	*27-Jul-2021 16:39*
Surr: Dibromofluoromethane	*94.8*			**0**	*80-119*	*%REC*	*25*	*27-Jul-2021 14:54*
Surr: Toluene-d8	*110*			**0**	*89-112*	*%REC*	*25*	*27-Jul-2021 14:54*
Surr: Toluene-d8	*112*			**0**	*89-112*	*%REC*	*250*	*27-Jul-2021 16:39*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	**0.00223**		**0.000144**	**0.000250**	**0.00100**	**mg/L**	1	30-Jul-2021 10:33
Ethene	**0.00411**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	30-Jul-2021 10:33
Methane	**0.407**		**0.00268**	**0.00625**	**0.0125**	**mg/L**	25	30-Jul-2021 13:17
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**363**		**5.00**	**5.00**	**5.00**	**mg/L**	1	23-Jul-2021 00:22
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**4.46**		**0.500**	**1.00**	**1.00**	**mg/L**	1	31-Jul-2021 12:54
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**4.32**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	21-Jul-2021 12:42
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	21-Jul-2021 12:42
Sulfate	**428**		**4.00**	**10.0**	**10.0**	**mg/L**	20	22-Jul-2021 18:48
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	04-Aug-2021 17:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071038
Sample ID: 16WW56-210720 Lab ID:HS21071038-02
Collection Date: 20-Jul-2021 07:55 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	26-Jul-2021 20:11
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	26-Jul-2021 20:11
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	26-Jul-2021 20:11
cis-1,2-Dichloroethene	**1.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	26-Jul-2021 20:11
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	26-Jul-2021 20:11
Trichloroethene	**12**		**0.20**	**0.50**	**1.0**	**ug/L**	1	26-Jul-2021 20:11
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	26-Jul-2021 20:11
Surr: 1,2-Dichloroethane-d4	*97.9*			**0**	*81-118*	*%REC*	*1*	*26-Jul-2021 20:11*
Surr: 4-Bromofluorobenzene	*90.2*			**0**	*85-114*	*%REC*	*1*	*26-Jul-2021 20:11*
Surr: Dibromofluoromethane	*96.6*			**0**	*80-119*	*%REC*	*1*	*26-Jul-2021 20:11*
Surr: Toluene-d8	*110*			**0**	*89-112*	*%REC*	*1*	*26-Jul-2021 20:11*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	30-Jul-2021 10:42
Ethene	**0.000714**	J	**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	30-Jul-2021 10:42
Methane	**0.00168**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	30-Jul-2021 10:42
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**168**		**5.00**	**5.00**	**5.00**	**mg/L**	1	23-Jul-2021 00:10
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**1.78**		**0.500**	**1.00**	**1.00**	**mg/L**	1	31-Jul-2021 13:08
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**4.29**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	21-Jul-2021 12:50
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	21-Jul-2021 12:50
Sulfate	**123**		**0.400**	**1.00**	**1.00**	**mg/L**	2	21-Jul-2021 12:50
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	04-Aug-2021 17:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071038
Sample ID: 16WW22-210720 Lab ID:HS21071038-03
Collection Date: 20-Jul-2021 08:50 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	26-Jul-2021 20:32
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	26-Jul-2021 20:32
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	26-Jul-2021 20:32
cis-1,2-Dichloroethene	**2.2**		**0.20**	**0.50**	**1.0**	**ug/L**	1	26-Jul-2021 20:32
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	26-Jul-2021 20:32
Trichloroethene	**13**		**0.20**	**0.50**	**1.0**	**ug/L**	1	26-Jul-2021 20:32
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	26-Jul-2021 20:32
Surr: 1,2-Dichloroethane-d4	*96.8*			**0**	*81-118*	*%REC*	*1*	*26-Jul-2021 20:32*
Surr: 4-Bromofluorobenzene	*91.2*			**0**	*85-114*	*%REC*	*1*	*26-Jul-2021 20:32*
Surr: Dibromofluoromethane	*99.5*			**0**	*80-119*	*%REC*	*1*	*26-Jul-2021 20:32*
Surr: Toluene-d8	*112*			**0**	*89-112*	*%REC*	*1*	*26-Jul-2021 20:32*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	30-Jul-2021 11:13
Ethene	**0.000673**	J	**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	30-Jul-2021 11:13
Methane	**0.00251**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	30-Jul-2021 11:13
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**243**		**5.00**	**5.00**	**5.00**	**mg/L**	1	23-Jul-2021 00:28
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**2.39**		**0.500**	**1.00**	**1.00**	**mg/L**	1	31-Jul-2021 13:38
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**4.85**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	21-Jul-2021 13:12
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	21-Jul-2021 13:12
Sulfate	**209**		**4.00**	**10.0**	**10.0**	**mg/L**	20	22-Jul-2021 19:03
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	04-Aug-2021 17:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071038
Sample ID: 16WW41-210720 Lab ID:HS21071038-04
Collection Date: 20-Jul-2021 09:40 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	27-Jul-2021 14:33
1,1-Dichloroethene	**17**		**2.0**	**5.0**	**10**	**ug/L**	10	27-Jul-2021 14:33
1,2-Dichloroethane	5.0	U	2.0	5.0	10	ug/L	10	27-Jul-2021 14:33
cis-1,2-Dichloroethene	**2,300**		**10**	**25**	**50**	**ug/L**	50	27-Jul-2021 16:18
Methylene chloride	**14**	J	**4.0**	**10**	**20**	**ug/L**	10	27-Jul-2021 14:33
Trichloroethene	**5,400**		**10**	**25**	**50**	**ug/L**	50	27-Jul-2021 16:18
Vinyl chloride	**270**		**2.0**	**5.0**	**10**	**ug/L**	10	27-Jul-2021 14:33
Surr: 1,2-Dichloroethane-d4	*92.6*			**0**	*81-118*	*%REC*	*10*	*27-Jul-2021 14:33*
Surr: 1,2-Dichloroethane-d4	*94.4*			**0**	*81-118*	*%REC*	*50*	*27-Jul-2021 16:18*
Surr: 4-Bromofluorobenzene	*90.8*			**0**	*85-114*	*%REC*	*50*	*27-Jul-2021 16:18*
Surr: 4-Bromofluorobenzene	*93.5*			**0**	*85-114*	*%REC*	*10*	*27-Jul-2021 14:33*
Surr: Dibromofluoromethane	*96.5*			**0**	*80-119*	*%REC*	*10*	*27-Jul-2021 14:33*
Surr: Dibromofluoromethane	*98.4*			**0**	*80-119*	*%REC*	*50*	*27-Jul-2021 16:18*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*50*	*27-Jul-2021 16:18*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*10*	*27-Jul-2021 14:33*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	30-Jul-2021 11:25
Ethene	**0.0138**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	30-Jul-2021 11:25
Methane	**0.0135**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	30-Jul-2021 11:25
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**983**		**5.00**	**5.00**	**5.00**	**mg/L**	1	23-Jul-2021 00:36
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**52.4**		**1.00**	**2.00**	**2.00**	**mg/L**	2	04-Aug-2021 13:20
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**1.92**		**0.300**	**1.00**	**1.00**	**mg/L**	10	21-Jul-2021 13:20
Nitrogen, Nitrate (As N)	1.00	U	0.300	1.00	1.00	mg/L	10	21-Jul-2021 13:20
Sulfate	**7,670**		**20.0**	**50.0**	**50.0**	**mg/L**	100	22-Jul-2021 19:10
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	04-Aug-2021 17:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071038
Sample ID: 16WW21-210720 Lab ID:HS21071038-05
Collection Date: 20-Jul-2021 10:30 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	26-Jul-2021 20:53
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	26-Jul-2021 20:53
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	26-Jul-2021 20:53
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	26-Jul-2021 20:53
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	26-Jul-2021 20:53
Trichloroethene	**1.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	26-Jul-2021 20:53
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	26-Jul-2021 20:53
Surr: 1,2-Dichloroethane-d4	*95.6*			**0**	*81-118*	*%REC*	*1*	*26-Jul-2021 20:53*
Surr: 4-Bromofluorobenzene	*87.2*			**0**	*85-114*	*%REC*	*1*	*26-Jul-2021 20:53*
Surr: Dibromofluoromethane	*97.3*			**0**	*80-119*	*%REC*	*1*	*26-Jul-2021 20:53*
Surr: Toluene-d8	*112*			**0**	*89-112*	*%REC*	*1*	*26-Jul-2021 20:53*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	04-Aug-2021 17:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071038
Sample ID: 16WW29-210720 Lab ID:HS21071038-06
Collection Date: 20-Jul-2021 11:20 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	27-Jul-2021 13:09
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 13:09
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 13:09
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 13:09
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	27-Jul-2021 13:09
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 13:09
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 13:09
Surr: 1,2-Dichloroethane-d4	*91.8*			**0**	*81-118*	*%REC*	*1*	*27-Jul-2021 13:09*
Surr: 4-Bromofluorobenzene	*89.5*			**0**	*85-114*	*%REC*	*1*	*27-Jul-2021 13:09*
Surr: Dibromofluoromethane	*94.5*			**0**	*80-119*	*%REC*	*1*	*27-Jul-2021 13:09*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*1*	*27-Jul-2021 13:09*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	30-Jul-2021 11:41
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	30-Jul-2021 11:41
Methane	**0.0215**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	30-Jul-2021 11:41
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**36.5**		**5.00**	**5.00**	**5.00**	**mg/L**	1	23-Jul-2021 00:41
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**17.4**		**0.500**	**1.00**	**1.00**	**mg/L**	1	31-Jul-2021 14:05
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**0.897**		**0.150**	**0.500**	**0.500**	**mg/L**	5	21-Jul-2021 13:27
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	21-Jul-2021 13:27
Sulfate	**1,790**		**10.0**	**25.0**	**25.0**	**mg/L**	50	22-Jul-2021 19:17
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	04-Aug-2021 17:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071038
Sample ID: 16WW29-210720-FD Lab ID:HS21071038-07
Collection Date: 20-Jul-2021 11:20 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	27-Jul-2021 13:30
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 13:30
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 13:30
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 13:30
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	27-Jul-2021 13:30
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 13:30
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 13:30
Surr: 1,2-Dichloroethane-d4	*92.0*			**0**	*81-118*	*%REC*	*1*	*27-Jul-2021 13:30*
Surr: 4-Bromofluorobenzene	*92.1*			**0**	*85-114*	*%REC*	*1*	*27-Jul-2021 13:30*
Surr: Dibromofluoromethane	*97.6*			**0**	*80-119*	*%REC*	*1*	*27-Jul-2021 13:30*
Surr: Toluene-d8	*113*	*S*		**0**	*89-112*	*%REC*	*1*	*27-Jul-2021 13:30*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	30-Jul-2021 12:06
Ethene	**0.00172**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	30-Jul-2021 12:06
Methane	**0.0223**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	30-Jul-2021 12:06
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**22.5**		**5.00**	**5.00**	**5.00**	**mg/L**	1	23-Jul-2021 00:47
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**17.0**		**0.500**	**1.00**	**1.00**	**mg/L**	1	31-Jul-2021 14:17
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**0.916**		**0.150**	**0.500**	**0.500**	**mg/L**	5	21-Jul-2021 13:34
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	21-Jul-2021 13:34
Sulfate	**1,790**		**10.0**	**25.0**	**25.0**	**mg/L**	50	22-Jul-2021 19:25
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	04-Aug-2021 17:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071038
Sample ID: 16WW30-210720 Lab ID:HS21071038-08
Collection Date: 20-Jul-2021 12:15 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	27-Jul-2021 12:48
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 12:48
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 12:48
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 12:48
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	27-Jul-2021 12:48
Trichloroethene	**12**		**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jul-2021 12:48
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 12:48
Surr: 1,2-Dichloroethane-d4	*90.7*			**0**	*81-118*	*%REC*	*1*	*27-Jul-2021 12:48*
Surr: 4-Bromofluorobenzene	*92.0*			**0**	*85-114*	*%REC*	*1*	*27-Jul-2021 12:48*
Surr: Dibromofluoromethane	*94.4*			**0**	*80-119*	*%REC*	*1*	*27-Jul-2021 12:48*
Surr: Toluene-d8	*111*			**0**	*89-112*	*%REC*	*1*	*27-Jul-2021 12:48*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	04-Aug-2021 17:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071038
Sample ID: 16WW51-210720 Lab ID:HS21071038-09
Collection Date: 20-Jul-2021 13:05 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	27-Jul-2021 14:12
1,1-Dichloroethene	**2.6**	J	**1.0**	**2.5**	**5.0**	**ug/L**	5	27-Jul-2021 14:12
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	ug/L	5	27-Jul-2021 14:12
cis-1,2-Dichloroethene	**71**		**1.0**	**2.5**	**5.0**	**ug/L**	5	27-Jul-2021 14:12
Methylene chloride	**6.8**	J	**2.0**	**5.0**	**10**	**ug/L**	5	27-Jul-2021 14:12
Trichloroethene	**1,800**		**5.0**	**12**	**25**	**ug/L**	25	27-Jul-2021 15:57
Vinyl chloride	2.5	U	1.0	2.5	5.0	ug/L	5	27-Jul-2021 14:12
Surr: 1,2-Dichloroethane-d4	*93.8*			**0**	*81-118*	*%REC*	*5*	*27-Jul-2021 14:12*
Surr: 1,2-Dichloroethane-d4	*92.3*			**0**	*81-118*	*%REC*	*25*	*27-Jul-2021 15:57*
Surr: 4-Bromofluorobenzene	*90.8*			**0**	*85-114*	*%REC*	*5*	*27-Jul-2021 14:12*
Surr: 4-Bromofluorobenzene	*88.9*			**0**	*85-114*	*%REC*	*25*	*27-Jul-2021 15:57*
Surr: Dibromofluoromethane	*97.3*			**0**	*80-119*	*%REC*	*5*	*27-Jul-2021 14:12*
Surr: Dibromofluoromethane	*99.0*			**0**	*80-119*	*%REC*	*25*	*27-Jul-2021 15:57*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*5*	*27-Jul-2021 14:12*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*25*	*27-Jul-2021 15:57*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	04-Aug-2021 17:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071038
Sample ID: Trip Blank-210720 Lab ID:HS21071038-10
Collection Date: 20-Jul-2021 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	27-Jul-2021 12:27
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 12:27
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 12:27
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 12:27
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	27-Jul-2021 12:27
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 12:27
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 12:27
Surr: 1,2-Dichloroethane-d4	*91.4*			**0**	*81-118*	*%REC*	*1*	*27-Jul-2021 12:27*
Surr: 4-Bromofluorobenzene	*91.7*			**0**	*85-114*	*%REC*	*1*	*27-Jul-2021 12:27*
Surr: Dibromofluoromethane	*96.6*			**0**	*80-119*	*%REC*	*1*	*27-Jul-2021 12:27*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*1*	*27-Jul-2021 12:27*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071038

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R387951 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** GW	
HS21071038-01	16WW16-210720	20 Jul 2021 07:35			21 Jul 2021 12:42	2
HS21071038-02	16WW56-210720	20 Jul 2021 07:55			21 Jul 2021 12:50	2
HS21071038-03	16WW22-210720	20 Jul 2021 08:50			21 Jul 2021 13:12	2
HS21071038-04	16WW41-210720	20 Jul 2021 09:40			21 Jul 2021 13:20	10
HS21071038-06	16WW29-210720	20 Jul 2021 11:20			21 Jul 2021 13:27	5
HS21071038-07	16WW29-210720-FD	20 Jul 2021 11:20			21 Jul 2021 13:34	5
Batch ID: R388042 (0)	**Test Name :** ALKALINITY BY SM 2320B-2011				**Matrix:** GW	
HS21071038-01	16WW16-210720	20 Jul 2021 07:35			23 Jul 2021 00:22	1
HS21071038-02	16WW56-210720	20 Jul 2021 07:55			23 Jul 2021 00:10	1
HS21071038-03	16WW22-210720	20 Jul 2021 08:50			23 Jul 2021 00:28	1
HS21071038-04	16WW41-210720	20 Jul 2021 09:40			23 Jul 2021 00:36	1
HS21071038-06	16WW29-210720	20 Jul 2021 11:20			23 Jul 2021 00:41	1
HS21071038-07	16WW29-210720-FD	20 Jul 2021 11:20			23 Jul 2021 00:47	1
Batch ID: R388098 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** GW	
HS21071038-01	16WW16-210720	20 Jul 2021 07:35			22 Jul 2021 18:48	20
HS21071038-03	16WW22-210720	20 Jul 2021 08:50			22 Jul 2021 19:03	20
HS21071038-04	16WW41-210720	20 Jul 2021 09:40			22 Jul 2021 19:10	100
HS21071038-06	16WW29-210720	20 Jul 2021 11:20			22 Jul 2021 19:17	50
HS21071038-07	16WW29-210720-FD	20 Jul 2021 11:20			22 Jul 2021 19:25	50
Batch ID: R388302 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** GW	
HS21071038-02	16WW56-210720	20 Jul 2021 07:55			26 Jul 2021 20:11	1
HS21071038-03	16WW22-210720	20 Jul 2021 08:50			26 Jul 2021 20:32	1
HS21071038-05	16WW21-210720	20 Jul 2021 10:30			26 Jul 2021 20:53	1
Batch ID: R388373 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21071038-10	Trip Blank-210720	20 Jul 2021 00:00			27 Jul 2021 12:27	1
Batch ID: R388373 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** GW	
HS21071038-01	16WW16-210720	20 Jul 2021 07:35			27 Jul 2021 16:39	250
HS21071038-01	16WW16-210720	20 Jul 2021 07:35			27 Jul 2021 14:54	25
HS21071038-04	16WW41-210720	20 Jul 2021 09:40			27 Jul 2021 16:18	50
HS21071038-04	16WW41-210720	20 Jul 2021 09:40			27 Jul 2021 14:33	10
HS21071038-06	16WW29-210720	20 Jul 2021 11:20			27 Jul 2021 13:09	1
HS21071038-07	16WW29-210720-FD	20 Jul 2021 11:20			27 Jul 2021 13:30	1
HS21071038-08	16WW30-210720	20 Jul 2021 12:15			27 Jul 2021 12:48	1
HS21071038-09	16WW51-210720	20 Jul 2021 13:05			27 Jul 2021 15:57	25
HS21071038-09	16WW51-210720	20 Jul 2021 13:05			27 Jul 2021 14:12	5

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 **DATES REPORT**
WorkOrder: HS21071038

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R388610 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** GW	
HS21071038-01	16WW16-210720	20 Jul 2021 07:35			30 Jul 2021 13:17	25
HS21071038-01	16WW16-210720	20 Jul 2021 07:35			30 Jul 2021 10:33	1
HS21071038-02	16WW56-210720	20 Jul 2021 07:55			30 Jul 2021 10:42	1
HS21071038-03	16WW22-210720	20 Jul 2021 08:50			30 Jul 2021 11:13	1
HS21071038-04	16WW41-210720	20 Jul 2021 09:40			30 Jul 2021 11:25	1
HS21071038-06	16WW29-210720	20 Jul 2021 11:20			30 Jul 2021 11:41	1
HS21071038-07	16WW29-210720-FD	20 Jul 2021 11:20			30 Jul 2021 12:06	1
Batch ID: R388670 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B-2011				**Matrix:** GW	
HS21071038-01	16WW16-210720	20 Jul 2021 07:35			31 Jul 2021 12:54	1
HS21071038-02	16WW56-210720	20 Jul 2021 07:55			31 Jul 2021 13:08	1
HS21071038-03	16WW22-210720	20 Jul 2021 08:50			31 Jul 2021 13:38	1
HS21071038-06	16WW29-210720	20 Jul 2021 11:20			31 Jul 2021 14:05	1
HS21071038-07	16WW29-210720-FD	20 Jul 2021 11:20			31 Jul 2021 14:17	1
Batch ID: R388834 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B-2011				**Matrix:** GW	
HS21071038-04	16WW41-210720	20 Jul 2021 09:40			04 Aug 2021 13:20	2
Batch ID: R388859 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** GW	
HS21071038-01	16WW16-210720	20 Jul 2021 07:35			04 Aug 2021 17:31	1
HS21071038-02	16WW56-210720	20 Jul 2021 07:55			04 Aug 2021 17:31	1
HS21071038-03	16WW22-210720	20 Jul 2021 08:50			04 Aug 2021 17:31	1
HS21071038-04	16WW41-210720	20 Jul 2021 09:40			04 Aug 2021 17:31	1
HS21071038-05	16WW21-210720	20 Jul 2021 10:30			04 Aug 2021 17:31	1
HS21071038-06	16WW29-210720	20 Jul 2021 11:20			04 Aug 2021 17:31	1
HS21071038-07	16WW29-210720-FD	20 Jul 2021 11:20			04 Aug 2021 17:31	1
HS21071038-08	16WW30-210720	20 Jul 2021 12:15			04 Aug 2021 17:31	1
HS21071038-09	16WW51-210720	20 Jul 2021 13:05			04 Aug 2021 17:31	1

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071038

QC BATCH REPORT

Batch ID: R388610 (0) **Instrument: FID-4** **Method: DISSOLVED GASES BY RSK-175**

MBLK Sample ID: **MBLK-210730** Units: **mg/L** Analysis Date: **30-Jul-2021 09:55**
Client ID: Run ID: **FID-4_388610** SeqNo: **6208821** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000250	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000250	0.000500								U

LCS Sample ID: **LCS-210730** Units: **mg/L** Analysis Date: **30-Jul-2021 10:05**
Client ID: Run ID: **FID-4_388610** SeqNo: **6208822** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0203	0.00100	0.01804	0	113	75 - 125				
Ethene	0.0175	0.00100	0.0168	0	104	75 - 125				
Methane	0.00983	0.000500	0.009647	0	102	75 - 125				

MS Sample ID: **HS21071204-02MS** Units: **mg/L** Analysis Date: **30-Jul-2021 14:47**
Client ID: Run ID: **FID-4_388610** SeqNo: **6208843** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.00961	0.00100	0.01804	0	53.3	75 - 125				S
Ethene	0.0105	0.00100	0.0168	0.002684	46.3	75 - 125				S
Methane	0.205	0.000500	0.009647	0.2549	-517	75 - 125				SEO

MS Sample ID: **HS21071038-02MS** Units: **mg/L** Analysis Date: **30-Jul-2021 10:52**
Client ID: **16WW56-210720** Run ID: **FID-4_388610** SeqNo: **6208826** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0166	0.00100	0.01804	0	92.2	75 - 125				
Ethene	0.0160	0.00100	0.0168	0.0007136	91.0	75 - 125				
Methane	0.00757	0.000500	0.009647	0.001677	61.0	75 - 125				S

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071038

QC BATCH REPORT

Batch ID: R388610 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MSD Sample ID: **HS21071204-02MSD** Units: **mg/L** Analysis Date: **30-Jul-2021 14:56**
Client ID: Run ID: **FID-4_388610** SeqNo: **6208844** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.00943	0.00100	0.01804	0	52.3	75 - 125	0.009611	1.88	30	S
Ethene	0.0108	0.00100	0.0168	0.002684	48.1	75 - 125	0.01047	2.83	30	S
Methane	0.206	0.000500	0.009647	0.2549	-506	75 - 125	0.2051	0.523	30	SEO

MSD Sample ID: **HS21071038-02MSD** Units: **mg/L** Analysis Date: **30-Jul-2021 11:04**
Client ID: **16WW56-210720** Run ID: **FID-4_388610** SeqNo: **6208827** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0166	0.00100	0.01804	0	91.8	75 - 125	0.01663	0.377	30	
Ethene	0.0161	0.00100	0.0168	0.0007136	91.8	75 - 125	0.01601	0.754	30	
Methane	0.00681	0.000500	0.009647	0.001677	53.2	75 - 125	0.007566	10.6	30	S

The following samples were analyzed in this batch: HS21071038-01 HS21071038-02 HS21071038-03 HS21071038-04 HS21071038-06 HS21071038-07

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071038

QC BATCH REPORT

Batch ID: R388302 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210726** Units: **ug/L** Analysis Date: **26-Jul-2021 16:40**
Client ID: Run ID: **VOA6_388302** SeqNo: **6201754** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*47.73*	*1.0*	*50*	*0*	*95.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*44.8*	*1.0*	*50*	*0*	*89.6*	*85 - 114*				
Surr: Dibromofluoromethane	*47.78*	*1.0*	*50*	*0*	*95.6*	*80 - 119*				
Surr: Toluene-d8	*55.99*	*1.0*	*50*	*0*	*112*	*89 - 112*				

LCS Sample ID: **VLCSW-210726** Units: **ug/L** Analysis Date: **26-Jul-2021 16:19**
Client ID: Run ID: **VOA6_388302** SeqNo: **6201753** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.22	1.0	20	0	96.1	80 - 119				
1,1-Dichloroethene	17.92	1.0	20	0	89.6	71 - 131				
1,2-Dichloroethane	19.38	1.0	20	0	96.9	73 - 128				
cis-1,2-Dichloroethene	19.33	1.0	20	0	96.6	78 - 123				
Methylene chloride	21.25	2.0	20	0	106	74 - 124				
Trichloroethene	17.89	1.0	20	0	89.5	79 - 123				
Vinyl chloride	18.06	1.0	20	0	90.3	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.88*	*1.0*	*50*	*0*	*108*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.7*	*1.0*	*50*	*0*	*95.4*	*85 - 114*				
Surr: Dibromofluoromethane	*54.54*	*1.0*	*50*	*0*	*109*	*80 - 119*				
Surr: Toluene-d8	*49.88*	*1.0*	*50*	*0*	*99.8*	*89 - 112*				

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071038

QC BATCH REPORT

Batch ID: R388302 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21071038-02MS** Units: **ug/L** Analysis Date: **26-Jul-2021 21:14**
Client ID: **16WW56-210720** Run ID: **VOA6_388302** SeqNo: **6201766** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.01	1.0	20	0	100	80 - 119				
1,1-Dichloroethene	19.13	1.0	20	0	95.6	71 - 131				
1,2-Dichloroethane	19.27	1.0	20	0	96.3	73 - 128				
cis-1,2-Dichloroethene	19.73	1.0	20	1.516	91.1	78 - 123				
Methylene chloride	19.41	2.0	20	0	97.1	74 - 124				
Trichloroethene	32.85	1.0	20	12.21	103	79 - 123				
Vinyl chloride	18.43	1.0	20	0	92.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*49.71*	*1.0*	*50*	*0*	*99.4*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*46.67*	*1.0*	*50*	*0*	*93.3*	*85 - 114*				
Surr: Dibromofluoromethane	*49.72*	*1.0*	*50*	*0*	*99.4*	*80 - 119*				
Surr: Toluene-d8	*54.46*	*1.0*	*50*	*0*	*109*	*89 - 112*				

MSD Sample ID: **HS21071038-02MSD** Units: **ug/L** Analysis Date: **26-Jul-2021 21:35**
Client ID: **16WW56-210720** Run ID: **VOA6_388302** SeqNo: **6201767** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.15	1.0	20	0	90.8	80 - 119	20.01	9.72	20	
1,1-Dichloroethene	17.28	1.0	20	0	86.4	71 - 131	19.13	10.2	20	
1,2-Dichloroethane	18.7	1.0	20	0	93.5	73 - 128	19.27	2.99	20	
cis-1,2-Dichloroethene	18.73	1.0	20	1.516	86.1	78 - 123	19.73	5.23	20	
Methylene chloride	17.85	2.0	20	0	89.3	74 - 124	19.41	8.39	20	
Trichloroethene	30.69	1.0	20	12.21	92.4	79 - 123	32.85	6.82	20	
Vinyl chloride	16.61	1.0	20	0	83.1	58 - 137	18.43	10.4	20	
Surr: 1,2-Dichloroethane-d4	*49.1*	*1.0*	*50*	*0*	*98.2*	*81 - 118*	*49.71*	*1.24*	*20*	
Surr: 4-Bromofluorobenzene	*48.11*	*1.0*	*50*	*0*	*96.2*	*85 - 114*	*46.67*	*3.04*	*20*	
Surr: Dibromofluoromethane	*48.75*	*1.0*	*50*	*0*	*97.5*	*80 - 119*	*49.72*	*1.98*	*20*	
Surr: Toluene-d8	*53.74*	*1.0*	*50*	*0*	*107*	*89 - 112*	*54.46*	*1.34*	*20*	

The following samples were analyzed in this batch: HS21071038-02 HS21071038-03 HS21071038-05

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071038

QC BATCH REPORT

Batch ID: R388373 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210727** Units: **ug/L** Analysis Date: **27-Jul-2021 11:44**
Client ID: Run ID: **VOA6_388373** SeqNo: **6203400** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.377	2.0								J
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.23*	*1.0*	*50*	*0*	*92.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*45.27*	*1.0*	*50*	*0*	*90.5*	*85 - 114*				
Surr: Dibromofluoromethane	*47.25*	*1.0*	*50*	*0*	*94.5*	*80 - 119*				
Surr: Toluene-d8	*55.76*	*1.0*	*50*	*0*	*112*	*89 - 112*				

LCS Sample ID: **VLCSW-210727** Units: **ug/L** Analysis Date: **27-Jul-2021 11:23**
Client ID: Run ID: **VOA6_388373** SeqNo: **6203399** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.48	1.0	20	0	92.4	80 - 119				
1,1-Dichloroethene	16.09	1.0	20	0	80.4	71 - 131				
1,2-Dichloroethane	18.75	1.0	20	0	93.8	73 - 128				
cis-1,2-Dichloroethene	18.46	1.0	20	0	92.3	78 - 123				
Methylene chloride	19.85	2.0	20	0	99.2	74 - 124				
Trichloroethene	19.91	1.0	20	0	99.5	79 - 123				
Vinyl chloride	16.28	1.0	20	0	81.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.36*	*1.0*	*50*	*0*	*96.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*46.74*	*1.0*	*50*	*0*	*93.5*	*85 - 114*				
Surr: Dibromofluoromethane	*49.95*	*1.0*	*50*	*0*	*99.9*	*80 - 119*				
Surr: Toluene-d8	*49.03*	*1.0*	*50*	*0*	*98.1*	*89 - 112*				

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071038

QC BATCH REPORT

Batch ID: R388373 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS21071204-02MS** Units: **ug/L** Analysis Date: **27-Jul-2021 15:15**
Client ID: Run ID: **VOA6_388373** SeqNo: **6203409** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.15	1.0	20	0	95.7	80 - 119				
1,1-Dichloroethene	15.81	1.0	20	0	79.0	71 - 131				
1,2-Dichloroethane	17.9	1.0	20	0	89.5	73 - 128				
cis-1,2-Dichloroethene	41.09	1.0	20	19.12	110	78 - 123				
Methylene chloride	19.15	2.0	20	0	95.8	74 - 124				
Trichloroethene	36.11	1.0	20	13.19	115	79 - 123				
Vinyl chloride	15.87	1.0	20	1.341	72.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.52*	*1.0*	*50*	*0*	*93.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.98*	*1.0*	*50*	*0*	*96.0*	*85 - 114*				
Surr: Dibromofluoromethane	*49.37*	*1.0*	*50*	*0*	*98.7*	*80 - 119*				
Surr: Toluene-d8	*53.46*	*1.0*	*50*	*0*	*107*	*89 - 112*				

MSD Sample ID: **HS21071204-02MSD** Units: **ug/L** Analysis Date: **27-Jul-2021 15:36**
Client ID: Run ID: **VOA6_388373** SeqNo: **6203410** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.88	1.0	20	0	89.4	80 - 119	19.15	6.87	20	
1,1-Dichloroethene	14.7	1.0	20	0	73.5	71 - 131	15.81	7.28	20	
1,2-Dichloroethane	16.68	1.0	20	0	83.4	73 - 128	17.9	7.03	20	
cis-1,2-Dichloroethene	37.55	1.0	20	19.12	92.2	78 - 123	41.09	9.01	20	
Methylene chloride	18.06	2.0	20	0	90.3	74 - 124	19.15	5.86	20	
Trichloroethene	32.28	1.0	20	13.19	95.4	79 - 123	36.11	11.2	20	
Vinyl chloride	15.41	1.0	20	1.341	70.4	58 - 137	15.87	2.91	20	
Surr: 1,2-Dichloroethane-d4	*46.09*	*1.0*	*50*	*0*	*92.2*	*81 - 118*	*46.52*	*0.931*	*20*	
Surr: 4-Bromofluorobenzene	*47.57*	*1.0*	*50*	*0*	*95.1*	*85 - 114*	*47.98*	*0.869*	*20*	
Surr: Dibromofluoromethane	*48.87*	*1.0*	*50*	*0*	*97.7*	*80 - 119*	*49.37*	*1*	*20*	
Surr: Toluene-d8	*53.19*	*1.0*	*50*	*0*	*106*	*89 - 112*	*53.46*	*0.502*	*20*	

The following samples were analyzed in this batch:

HS21071038-01	HS21071038-04	HS21071038-06	HS21071038-07
HS21071038-08	HS21071038-09	HS21071038-10	

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071038

QC BATCH REPORT

Batch ID: R387951 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **21-Jul-2021 10:25**
Client ID: Run ID: **ICS-Integrion_387951** SeqNo: **6194051** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS** Units: **mg/L** Analysis Date: **21-Jul-2021 10:32**
Client ID: Run ID: **ICS-Integrion_387951** SeqNo: **6194052** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	4.61	0.100	4	0	115	80 - 120				
Nitrogen, Nitrate (As N)	4.265	0.100	4	0	107	80 - 120				
Sulfate	21.25	0.500	20	0	106	80 - 120				

MS Sample ID: **HS21071049-17MS** Units: **mg/L** Analysis Date: **21-Jul-2021 16:25**
Client ID: Run ID: **ICS-Integrion_387951** SeqNo: **6194078** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.151	0.100	2	0	108	80 - 120				
Nitrogen, Nitrate (As N)	2.277	0.100	2	0.2315	102	80 - 120				
Sulfate	12.42	0.500	10	2.083	103	80 - 120				

MS Sample ID: **HS21071038-02MS** Units: **mg/L** Analysis Date: **21-Jul-2021 12:57**
Client ID: **16WW56-210720** Run ID: **ICS-Integrion_387951** SeqNo: **6194057** PrepDate: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	8.523	0.200	4	4.294	106	80 - 120				
Nitrogen, Nitrate (As N)	4.074	0.200	4	0	102	80 - 120				
Sulfate	140.1	1.00	20	123.1	84.9	80 - 120				O

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071038

QC BATCH REPORT

Batch ID: R387951 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS21071049-17MSD** Units: **mg/L** Analysis Date: **21-Jul-2021 16:32**
Client ID: Run ID: **ICS-Integrion_387951** SeqNo: **6194079** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.107	0.100	2	0	105	80 - 120	2.151	2.06	20	
Nitrogen, Nitrate (As N)	2.232	0.100	2	0.2315	100	80 - 120	2.277	2	20	
Sulfate	12.07	0.500	10	2.083	99.9	80 - 120	12.42	2.81	20	

MSD Sample ID: **HS21071038-02MSD** Units: **mg/L** Analysis Date: **21-Jul-2021 13:05**
Client ID: **16WW56-210720** Run ID: **ICS-Integrion_387951** SeqNo: **6194058** PrepDate: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	8.666	0.200	4	4.294	109	80 - 120	8.523	1.67	20	
Nitrogen, Nitrate (As N)	4.166	0.200	4	0	104	80 - 120	4.074	2.23	20	
Sulfate	144.4	1.00	20	123.1	106	80 - 120	140.1	2.99	20	O

The following samples were analyzed in this batch: HS21071038-01 HS21071038-02 HS21071038-03 HS21071038-04 HS21071038-06 HS21071038-07

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071038

QC BATCH REPORT

Batch ID: R388042 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM 2320B-2011**

MBLK Sample ID: **WBLKW2-210722** Units: **mg/L** Analysis Date: **22-Jul-2021 23:56**
Client ID: Run ID: **ManTech01_388042** SeqNo: **6195859** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **WLCS2-210722** Units: **mg/L** Analysis Date: **22-Jul-2021 23:35**
Client ID: Run ID: **ManTech01_388042** SeqNo: **6195856** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1050	5.00	1000	0	105	85 - 115				

LCSD Sample ID: **WLCSD2-210722** Units: **mg/L** Analysis Date: **23-Jul-2021 00:05**
Client ID: Run ID: **ManTech01_388042** SeqNo: **6195860** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1029	5.00	1000	0	103	85 - 115	1050	2.06	20	

DUP Sample ID: **HS21071038-02DUP** Units: **mg/L** Analysis Date: **23-Jul-2021 00:16**
Client ID: **16WW56-210720** Run ID: **ManTech01_388042** SeqNo: **6195862** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	185.2	5.00					168.1	9.66	20	

The following samples were analyzed in this batch: HS21071038-01 HS21071038-02 HS21071038-03 HS21071038-04 HS21071038-06 HS21071038-07

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071038

QC BATCH REPORT

Batch ID: R388098 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **22-Jul-2021 14:28**
Client ID: Run ID: **ICS-Integrion_388098** SeqNo: **6196955** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	0.2307	0.500								J

LCS Sample ID: **LCS** Units: **mg/L** Analysis Date: **22-Jul-2021 14:35**
Client ID: Run ID: **ICS-Integrion_388098** SeqNo: **6196956** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	20	0.500	20	0	100	80 - 120				

MS Sample ID: **HS21071128-04MS** Units: **mg/L** Analysis Date: **22-Jul-2021 16:27**
Client ID: Run ID: **ICS-Integrion_388098** SeqNo: **6196962** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	83.8	0.500	10	77.83	59.7	80 - 120				SO

MS Sample ID: **HS21071112-01MS** Units: **mg/L** Analysis Date: **22-Jul-2021 19:40**
Client ID: Run ID: **ICS-Integrion_388098** SeqNo: **6196982** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	33.41	0.500	10	22.88	105	80 - 120				

MSD Sample ID: **HS21071128-04MSD** Units: **mg/L** Analysis Date: **22-Jul-2021 16:34**
Client ID: Run ID: **ICS-Integrion_388098** SeqNo: **6196963** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	84.12	0.500	10	77.83	63.0	80 - 120	83.8	0.39	20	SO

MSD Sample ID: **HS21071112-01MSD** Units: **mg/L** Analysis Date: **22-Jul-2021 19:47**
Client ID: Run ID: **ICS-Integrion_388098** SeqNo: **6196983** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	32.34	0.500	10	22.88	94.6	80 - 120	33.41	3.23	20	

The following samples were analyzed in this batch: HS21071038-01 HS21071038-03 HS21071038-04 HS21071038-06 HS21071038-07

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071038

QC BATCH REPORT

Batch ID: R388670 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B-2011**

MBLK Sample ID: **MBLK-073121** Units: **mg/L** Analysis Date: **31-Jul-2021 12:15**
Client ID: Run ID: **TOC_04_388670** SeqNo: **6210195** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **LCS-07312021** Units: **mg/L** Analysis Date: **31-Jul-2021 12:27**
Client ID: Run ID: **TOC_04_388670** SeqNo: **6210196** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.44	1.00	10	0	104	85 - 115				

LCSD Sample ID: **LCSD-07312021** Units: **mg/L** Analysis Date: **31-Jul-2021 12:39**
Client ID: Run ID: **TOC_04_388670** SeqNo: **6210197** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.34	1.00	10	0	103	85 - 115	10.44	0.962	20	

MS Sample ID: **HS21071038-02MS** Units: **mg/L** Analysis Date: **31-Jul-2021 13:23**
Client ID: **16WW56-210720** Run ID: **TOC_04_388670** SeqNo: **6210200** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	11.68	1.00	10	1.781	99.0	80 - 120				

The following samples were analyzed in this batch: HS21071038-01 HS21071038-02 HS21071038-03 HS21071038-06 HS21071038-07

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071038

QC BATCH REPORT

Batch ID: R388834 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B-2011**

MBLK Sample ID: **MBLK-073121** Units: **mg/L** Analysis Date: **04-Aug-2021 10:44**
Client ID: Run ID: **TOC_04_388834** SeqNo: **6213941** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **LCS-07312021** Units: **mg/L** Analysis Date: **04-Aug-2021 10:56**
Client ID: Run ID: **TOC_04_388834** SeqNo: **6213942** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	11.43	1.00	10	0	114	85 - 115				

LCSD Sample ID: **LCSD-07312021** Units: **mg/L** Analysis Date: **04-Aug-2021 11:08**
Client ID: Run ID: **TOC_04_388834** SeqNo: **6213943** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	11.03	1.00	10	0	110	85 - 115	11.43	3.56	20	

MS Sample ID: **HS21071079-32MS** Units: **mg/L** Analysis Date: **04-Aug-2021 11:56**
Client ID: Run ID: **TOC_04_388834** SeqNo: **6213945** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	23.97	1.00	10	11.82	122	80 - 120				S

The following samples were analyzed in this batch: HS21071038-04

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: **HS21071038**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	21-022-0	26-Mar-2022
Dept of Defense	PJLA L20-507-R2	22-Dec-2021
Florida	E87611-33	30-Jun-2022
Illinois	2000322021-7	09-May-2022
Kansas	E-10352 2021-2022	31-Jul-2022
Kentucky	123043, 2021-2022	30-Apr-2022
Louisiana	03087, 2021-2022	30-Jun-2022
North Carolina	624-2021	31-Dec-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-21-27	30-Apr-2022

ALS Houston, US Date: 04-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21071038

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS21071038-01	16WW16-210720	Login	7/21/2021 11:30:13 AM	PJM	WET027
HS21071038-01	16WW16-210720	Login	7/21/2021 11:30:13 AM	PJM	Sub
HS21071038-01	16WW16-210720	Login	7/21/2021 11:30:13 AM	PJM	B038
HS21071038-01	16WW16-210720	Login	7/21/2021 11:30:13 AM	PJM	RSK014
HS21071038-01	16WW16-210720	Login	7/21/2021 11:30:13 AM	PJM	WET238
HS21071038-02	16WW56-210720	Login	7/21/2021 11:30:13 AM	PJM	WET027
HS21071038-02	16WW56-210720	Login	7/21/2021 11:30:13 AM	PJM	Sub
HS21071038-02	16WW56-210720	Login	7/21/2021 11:30:13 AM	PJM	B038
HS21071038-02	16WW56-210720	Login	7/21/2021 11:30:13 AM	PJM	RSK014
HS21071038-02	16WW56-210720	Login	7/21/2021 11:30:13 AM	PJM	WET238
HS21071038-03	16WW22-210720	Login	7/21/2021 11:30:13 AM	PJM	WET027
HS21071038-03	16WW22-210720	Login	7/21/2021 11:30:13 AM	PJM	Sub
HS21071038-03	16WW22-210720	Login	7/21/2021 11:30:13 AM	PJM	B038
HS21071038-03	16WW22-210720	Login	7/21/2021 11:30:13 AM	PJM	RSK014
HS21071038-03	16WW22-210720	Login	7/21/2021 11:30:13 AM	PJM	WET238
HS21071038-04	16WW41-210720	Login	7/21/2021 11:30:13 AM	PJM	WET027
HS21071038-04	16WW41-210720	Login	7/21/2021 11:30:13 AM	PJM	Sub
HS21071038-04	16WW41-210720	Login	7/21/2021 11:30:13 AM	PJM	B038
HS21071038-04	16WW41-210720	Login	7/21/2021 11:30:13 AM	PJM	RSK014
HS21071038-04	16WW41-210720	Login	7/21/2021 11:30:13 AM	PJM	WET238
HS21071038-05	16WW21-210720	Login	7/21/2021 11:30:13 AM	PJM	Sub
HS21071038-05	16WW21-210720	Login	7/21/2021 11:30:13 AM	PJM	B038
HS21071038-06	16WW29-210720	Login	7/21/2021 11:30:13 AM	PJM	WET027
HS21071038-06	16WW29-210720	Login	7/21/2021 11:30:13 AM	PJM	Sub
HS21071038-06	16WW29-210720	Login	7/21/2021 11:30:13 AM	PJM	B038
HS21071038-06	16WW29-210720	Login	7/21/2021 11:30:13 AM	PJM	RSK014
HS21071038-06	16WW29-210720	Login	7/21/2021 11:30:13 AM	PJM	WET238
HS21071038-07	16WW29-210720-FD	Login	7/21/2021 11:30:13 AM	PJM	WET027
HS21071038-07	16WW29-210720-FD	Login	7/21/2021 11:30:13 AM	PJM	Sub
HS21071038-07	16WW29-210720-FD	Login	7/21/2021 11:30:13 AM	PJM	B038
HS21071038-07	16WW29-210720-FD	Login	7/21/2021 11:30:13 AM	PJM	RSK014
HS21071038-07	16WW29-210720-FD	Login	7/21/2021 11:30:13 AM	PJM	WET238
HS21071038-08	16WW30-210720	Login	7/21/2021 11:30:13 AM	PJM	Sub
HS21071038-08	16WW30-210720	Login	7/21/2021 11:30:13 AM	PJM	B038
HS21071038-09	16WW51-210720	Login	7/21/2021 11:30:13 AM	PJM	Sub
HS21071038-09	16WW51-210720	Login	7/21/2021 11:30:13 AM	PJM	B038
HS21071038-10	Trip Blank-210720	Login	7/21/2021 11:30:13 AM	PJM	B038

ALS Houston, US Date: 04-Aug-21

Sample Receipt Checklist

Work Order ID: HS21071038 **Date/Time Received:** 21-Jul-2021 09:05

Client Name: CBI-Houston **Received by:** Jared R. Makan

Completed By:	/S/ Pablo Marinez	21-Jul-2021 11:31	**Reviewed by:**	/S/ Ragen Giga	21-Jul-2021 19:28
	eSignature	Date/Time		eSignature	Date/Time

Matrices: **WATER** Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:CLIENT
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	0.7°C UC/C	IR 31
Cooler(s)/Kit(s):	47131	
Date/Time sample(s) sent to storage:	7/21/21 11:40	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

HS21071038

Aptim Environmental & Infrastucture, Inc.

Longhorn Army Ammunition Plant LHAAP 16 July 20

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 501032
Job: **LHAAP 16 July 2021**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D. / Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16WW16-210720	WG	7/20/21/0735		10	X	X	X	X	X	X						
16WW56-210720	WG	7/20/21/0755		10	X	X	X	X	X	X						
16WW56-210720-MS	WG	7/20/21/0755		10	X	X	X	X	X	X						
16WW56-210720-MSD	WG	7/20/21/0755		10	X	X	X	X	X	X						
16WW22-210720	WG	7/20/21/0850		10	X	X	X	X	X	X						
16WW41-210720	WG	7/20/21/0940		10	X	X	X	X	X	X						
16WW21-210720	WG	7/20/21/1030		4	X					X						
16WW29-210720	WG	7/20/21/1120		10	X	X	X	X	X	X						

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	7/20/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Mulligan	7/21/2	09:05							

Remarks: Cooler 47131 12231
Temp 0.7°C CF0

HS21071038

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant LHAAP 16 July 20

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 501032
Job: **LHAAP 16 July 2021**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D. / Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16WW29-210720-FD	WG	7/20/21/ 1120		10	X	X	X	X	X	X						
16WW30-210720	WG	7/20/21/1215		4	X					X						
16WW51-210720	WG	7/20/21/1305		4	X					X						
TRIP BLANK-210720	WG	7/20/21		2	X											

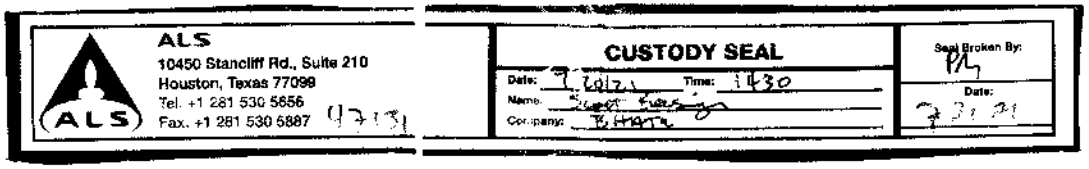
Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	7/20/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Mascorro	7/21/21	09:05							

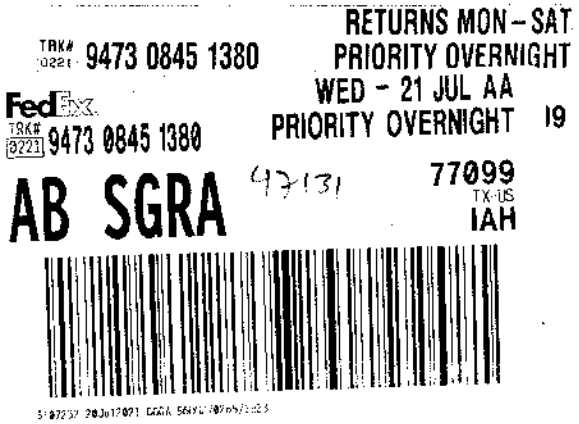
Remarks:
Cooler 47131 11231
Temp 0.7°C CF0



ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887 97131

CUSTODY SEAL
Date: 7.20.21 Time: 1430
Name: Scott Sweeney
Company: ALS Houston

Seal Broken By: PL
Date: 7.21.21



TRK# 9473 0845 1380

RETURNS MON-SAT
PRIORITY OVERNIGHT
WED - 21 JUL AA
PRIORITY OVERNIGHT 19

FedEx
TRK# 9473 0845 1380

AB SGRA 97131

77099
TX-US
IAH

August 04, 2021 Service Request No:E2100813

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

Laboratory Results for: HS21071038

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory July 21, 2021
For your reference, these analyses have been assigned our service request number **E2100813.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100813
Project:	HS21071038	**Date Received:**	07/21/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Nine samples were received for analysis at ALS Environmental in Houston on 07/21/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100452: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch. The LCS and DLCS recoveries are within QC limits. MS/MSD recoveries were recovered above the upper control limits.

DoD certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2100813
Project: HS21071038

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100813-001	16WW16-210720	7/20/2021	0735
E2100813-002	16WW56-210720	7/20/2021	0755
E2100813-003	16WW22-210720	7/20/2021	0850
E2100813-004	16WW41-210720	7/20/2021	0940
E2100813-005	16WW21-210720	7/20/2021	1030
E2100813-006	16WW29-210720	7/20/2021	1120
E2100813-007	16WW29-210720-FD	7/20/2021	1120
E2100813-008	16WW30-210720	7/20/2021	1215
E2100813-009	16WW51-210720	7/20/2021	1305

Service Request Summary

Folder #: **E2100813**
Client Name: ALS Environmental - US
Project Name: HS21071038
Project Number:

Report To: Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 07/21/21
Internal Due Date: 8/4/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21071038
EDD: No EDD Specified

11 125 mL-Plastic Bottle Plastic
Location: EHRMS-AirArch 1
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100813-001	16WW16-210720	Ground Water	07/20/21 0735	**IV**
E2100813-002	16WW56-210720	Ground Water	07/20/21 0755	**IV**
E2100813-003	16WW22-210720	Ground Water	07/20/21 0850	**IV**
E2100813-004	16WW41-210720	Ground Water	07/20/21 0940	**IV**
E2100813-005	16WW21-210720	Ground Water	07/20/21 1030	**IV**
E2100813-006	16WW29-210720	Ground Water	07/20/21 1120	**IV**
E2100813-007	16WW29-210720-FD	Ground Water	07/20/21 1120	**IV**
E2100813-008	16WW30-210720	Ground Water	07/20/21 1215	**IV**
E2100813-009	16WW51-210720	Ground Water	07/20/21 1305	**IV**

Service Request Summary

Folder #: **E2100813**
Client Name: ALS Environmental - US
Project Name: HS21071038
Project Number:

Report To: Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 07/21/21
Internal Due Date: 8/4/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21071038
EDD: No EDD Specified

11 125 mL-Plastic Bottle Plastic
Location: EHRMS-AirArch 1
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	8	Level II due 8/4,IV due 8/11
Semivoa GCMS	ClO4 DOD/6850	1	MS/MSD

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arkansas Department of Environmental Quality	21-022-0	3/26/2022
Arkansas Department of Environmental Quality	19-028-0	6/30/2022
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-33	6/30/2022
Hawaii Department of Health	2021-2022	4/30/2022
Kansas Department of Health and Environment	E-10352 2022	7/31/2022
Louisiana Department of Environmental Quality	03087-2021	6/30/2022
Louisiana Department of Health and Hospitals	LA028-2021	12/31/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Minnesota Department of Health	2021671	12/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209421	4/24/2022
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	68-03441-015	6/30/2022
Tennessee Department of Environment and Concervation	04016-2021	4/30/2022
Texas Commision on Environmental Quality	T104704231-21-27	4/30/2022
United States Department of Agriculture	P330-19-00299	10/10/2022

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 16531**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	Ragen Giga
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RagenP.Giga@ALSGlobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS21071038
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21071038-01**	**16WW16-210720**	**GW**	**20 Jul 2021 07:35**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			04 Aug 2021
2.	**HS21071038-02**	**16WW56-210720**	**GW**	**20 Jul 2021 07:55**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			04 Aug 2021
3.	**HS21071038-03**	**16WW22-210720**	**GW**	**20 Jul 2021 08:50**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			04 Aug 2021
4.	**HS21071038-04**	**16WW41-210720**	**GW**	**20 Jul 2021 09:40**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			04 Aug 2021
5.	**HS21071038-05**	**16WW21-210720**	**GW**	**20 Jul 2021 10:30**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			04 Aug 2021
6.	**HS21071038-06**	**16WW29-210720**	**GW**	**20 Jul 2021 11:20**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			04 Aug 2021
7.	**HS21071038-07**	**16WW29-210720-FD**	**GW**	**20 Jul 2021 11:20**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			04 Aug 2021
8.	**HS21071038-08**	**16WW30-210720**	**GW**	**20 Jul 2021 12:15**

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 16531**

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			04 Aug 2021
9.	**HS21071038-09**	**16WW51-210720**	**GW**	**20 Jul 2021 13:05**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			04 Aug 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 7.21.21 11:15

Received By: _____ Date/Time: 7/21/21 1115

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

Cooler Receipt Form

Project Chemist CA

Client/Project ALS-H

Thermometer ID IR31

Date/Time Received: 7/21/21 Initials: CA Date/Time Logged in: 7/21/21 Initials CA

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ ALS Courier ○ Client

2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ✓ No
   Were they intact? ○ Yes ○ No ✓ N/A
   Were they signed and dated? ○ Yes ○ No ✓ N/A
   If yes, how many and where?

4. Packing Material: ○ Inserts ✓ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		7/21/21	1115	CA	2.9	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No
10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 383718 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** **Prep Date/Time:** 7/22/21 10:06

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100812-001	LH18/24-SP650_072021_BIX	.01	6850/ClO4 DOD			Water	10mL	
2	E2100813-001	16WW16-210720	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2100813-002	16WW56-210720	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2100813-003	16WW22-210720	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100813-004	16WW41-210720	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100813-005	16WW21-210720	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100813-006	16WW29-210720	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2100813-007	16WW29-210720-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2100813-008	16WW30-210720	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2100813-009	16WW51-210720	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2100814-001	MOSA-21-231362	.01	6850/ClO4 DOD			Water	10mL	
12	E2100814-002	MOSA-21-231363	.01	6850/ClO4 DOD			Water	10mL	
13	E2100814-003	MOSA-21-231368	.01	6850/ClO4 DOD			Water	10mL	
14	E2100814-004	MOSA-21-231369	.01	6850/ClO4 DOD			Water	10mL	
15	E2100814-005	MOSA-21-231370	.01	6850/ClO4 DOD			Water	10mL	
16	EQ2100452-01	MB		6850/ClO4 DOD			Liquid	10mL	
17	EQ2100452-02	LCS		6850/ClO4 DOD			Liquid	10mL	
18	EQ2100452-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
19	EQ2100452-04	16WW56-210720 MS	.01	6850/ClO4 DOD			Liquid	10mL	
20	EQ2100452-05	16WW56-210720 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 214765 Logbook Ref: Sodium Perchlorate Expires On: 12/11/2022

E2100812-001 100.00µL EQ2100452-01 100.00µL EQ2100452-02 100.00µL EQ2100452-03 100.00µL

Name: Perchlorate Intermediate Stock1 Inventory ID 217422 Logbook Ref: Perchlorate Expires On: 11/26/2021

EQ2100452-02 1.00µL EQ2100452-03 1.00µL

Preparation Materials

Water HPLC Grade 07/01/2021 (217919) 537M Glass Culture Tubes 537M Glass Tubes (218064)

Preparation Information Benchsheet

Prep Run#: 383718 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** **Prep Date/Time:** 7/22/21 10:06

Preparation Steps

Step: Preparation
Started: 7/22/21 10:06
Finished: 7/22/21 11:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 7/22/21

Chain of Custody

Relinquished By:		Date:		Extracts Examined
Received By:		Date:		Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100813
Project:	HS21071038	**Date Collected:**	7/20/21 0735
Sample Matrix:	Ground Water	**Date Received:**	7/21/21
Sample Name:	16WW16-210720	**Units:**	µg/L
Lab Code:	E2100813-001	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**408**		2.00	1.00	0.500	20	7/22/21	8/2/21 17:51	383718	733464	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100813
Project:	HS21071038	**Date Collected:**	7/20/21 0755
Sample Matrix:	Ground Water	**Date Received:**	7/21/21
Sample Name:	16WW56-210720	**Units:**	µg/L
Lab Code:	E2100813-002	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	7/22/21	8/2/21 19:17	383718	733464	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100813
Project:	HS21071038	**Date Collected:**	7/20/21 0850
Sample Matrix:	Ground Water	**Date Received:**	7/21/21
Sample Name:	16WW22-210720	**Units:**	µg/L
Lab Code:	E2100813-003	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.148**		0.100	0.0500	0.0250	1	7/22/21	8/2/21 19:25	383718	733464	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100813
Project:	HS21071038	**Date Collected:**	7/20/21 0940
Sample Matrix:	Ground Water	**Date Received:**	7/21/21
Sample Name:	16WW41-210720	**Units:**	µg/L
Lab Code:	E2100813-004	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**107**		2.00	1.00	0.500	20	7/22/21	8/2/21 18:00	383718	733464	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100813
Project:	HS21071038	**Date Collected:**	7/20/21 1030
Sample Matrix:	Ground Water	**Date Received:**	7/21/21
Sample Name:	16WW21-210720	**Units:**	µg/L
Lab Code:	E2100813-005	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	7/22/21	8/3/21 18:17	383718	733599	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100813
Project:	HS21071038	**Date Collected:**	7/20/21 1120
Sample Matrix:	Ground Water	**Date Received:**	7/21/21
Sample Name:	16WW29-210720	**Units:**	µg/L
Lab Code:	E2100813-006	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.500	0.250	0.125	5	7/22/21	8/3/21 12:28	383718	733599	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100813
Project:	HS21071038	**Date Collected:**	7/20/21 1120
Sample Matrix:	Ground Water	**Date Received:**	7/21/21
Sample Name:	16WW29-210720-FD	**Units:**	µg/L
Lab Code:	E2100813-007	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.500	0.250	0.125	5	7/22/21	8/3/21 12:36	383718	733599	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100813
Project:	HS21071038	**Date Collected:**	7/20/21 1215
Sample Matrix:	Ground Water	**Date Received:**	7/21/21
Sample Name:	16WW30-210720	**Units:**	µg/L
Lab Code:	E2100813-008	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	7/22/21	8/2/21 19:59	383718	733464	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100813
Project:	HS21071038	**Date Collected:**	7/20/21 1305
Sample Matrix:	Ground Water	**Date Received:**	7/21/21
Sample Name:	16WW51-210720	**Units:**	µg/L
Lab Code:	E2100813-009	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	7/22/21	8/2/21 20:16	383718	733464	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100813
Project:	HS21071038	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100452-01	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	7/22/21	7/22/21 12:23	383718	732167	

Accuracy & Precision

ALS Environmental - Houston HRMS
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www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21071038
Sample Matrix: Ground Water

Service Request: E2100813
Date Analyzed: 7/22/21

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Units: µg/L
Basis: As Received

Extraction Lot: 383718

	Lab Control Sample EQ2100452-02			Duplicate Lab Control Sample EQ2100452-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0914	0.100	91	0.0851	0.100	85	84 - 119	7	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100813
Project:	HS21071038	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100452-02	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0914**	J	0.100	0.0500	0.0250	1	7/22/21	7/22/21 12:32	383718	732167	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100813
Project:	HS21071038	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100452-03	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0851**	J	0.100	0.0500	0.0250	1	7/22/21	7/22/21 12:40	383718	732167	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100813
Project:	HS21071038	**Date Collected:**	7/20/21
Sample Matrix:	Ground Water	**Date Received:**	7/21/21
		Date Analyzed:	8/ 2/21

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	16WW56-210720	**Units:**	µg/L
Lab Code:	E2100813-002	**Basis:**	As Received

Analytical Method: 6850
Prep Method: Method

		16WW56-210720MS				16WW56-210720DMS					
		Matrix Spike				**Duplicate Matrix Spike**					
		EQ2100452-04				EQ2100452-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**		**Result**	**Spike Amount**	**% Rec**		**% Rec Limits**	**RPD**		**RPD Limit**
Perchlorate	ND	0.165	0.100	165	*	0.141	0.100	141	*	84 - 119	16	*	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100813
Project:	HS21071038	**Date Collected:**	7/20/21 0755
Sample Matrix:	Ground Water	**Date Received:**	7/21/21
Sample Name:	16WW56-210720	**Units:**	µg/L
Lab Code:	EQ2100452-04	**Basis:**	As Received
Run Type:	Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.165**		0.100	0.0500	0.0250	1	7/22/21	8/2/21 19:00	383718	733464	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100813
Project:	HS21071038	**Date Collected:**	7/20/21 0755
Sample Matrix:	Ground Water	**Date Received:**	7/21/21
Sample Name:	16WW56-210720	**Units:**	µg/L
Lab Code:	EQ2100452-05	**Basis:**	As Received
Run Type:	Duplicate Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.141**		0.100	0.0500	0.0250	1	7/22/21	8/2/21 19:08	383718	733464	

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Houston, TX 77099
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August 09, 2021

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
10333 Richmond Ave
Ste 1030
Houston, TX 77042

Work Order: **HS21071204**

Laboratory Results for: **Longhorn Army Ammunition Plant LHAAP 16 July 2021**

Dear Vicki Graves ,

ALS Environmental received 9 sample(s) on Jul 23, 2021 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Ragen Giga
Project Manager

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21071204

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21071204-01	16EW03-210722	GW		22-Jul-2021 07:15	23-Jul-2021 09:00	☐
HS21071204-02	16IW10-210722	GW		22-Jul-2021 08:05	23-Jul-2021 09:00	☐
HS21071204-03	16IW03-210722	GW		22-Jul-2021 09:05	23-Jul-2021 09:00	☐
HS21071204-04	16PM09-210722	GW		22-Jul-2021 11:05	23-Jul-2021 09:00	☐
HS21071204-05	16PM14-210722	GW		22-Jul-2021 11:50	23-Jul-2021 09:00	☐
HS21071204-06	16RW11-210722	GW		22-Jul-2021 12:35	23-Jul-2021 09:00	☐
HS21071204-07	16RW11-210722-FD	GW		22-Jul-2021 12:35	23-Jul-2021 09:00	☐
HS21071204-08	16IW20-210722	GW		22-Jul-2021 13:15	23-Jul-2021 09:00	☐
HS21071204-09	Trip Blank-210722	Water	CG-061121-133	22-Jul-2021 00:00	23-Jul-2021 09:00	☐

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21071204

Work Order Comments

- 16RW11-210722 - VOC vial 1 of 3 contains >6mm headspace

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston Specialty Lab. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R388610

Sample ID: 16IW03-210722 (HS21071204-03)

- Preservation of VOA vials can only be verified after samples are analyzed. Based on the post-analytical screening, the following chemically-preserved samples were found to have a pH >2.

Sample ID: 16IW10-210722 (HS21071204-02MS)

- The recovery of the Matrix Spike (MS) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS may be due to sample matrix interference.

Sample ID: 16IW10-210722 (HS21071204-02MSD)

- The recovery of the Matrix Spike (MS) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS may be due to sample matrix interference.

Sample ID: HS21071038-02MS

- MS and MSD are for an unrelated sample (Methane)

GCMS Volatiles by Method SW8260

Batch ID: R388373

Sample ID: 16EW03-210722 (HS21071204-01)

- Lowest practical dilution for sample HS21071204-01 due to matrix.

Batch ID: R388821

Sample ID: HS21071731-01MS

- MS and MSD are for an unrelated sample

WetChemistry by Method SM5310B

Batch ID: R388982

Sample ID: 16IW10-210722 (HS21071204-02MS)

- The MS recovery was outside of the control; however, the result in the parent sample is greater than 4x the spike amount.

Batch ID: R389042

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21071204

WetChemistry by Method SM2320B

Batch ID: R388430

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: R388195

Sample ID: 16EW03-210722 (HS21071204-01)

- Sample ran at 5X due to high concentration of Sulfate

Sample ID: 16IW03-210722 (HS21071204-03)

- The reporting limit is elevated due to dilution for high concentrations of non-target analytes. (Nitrogen, Nitrate (As N))

Sample ID: 16IW10-210722 (HS21071204-02)

- The reporting limit is elevated due to dilution for high concentrations of non-target analytes. (Nitrogen, Nitrate (As N))

Sample ID: 16IW20-210722 (HS21071204-08)

- The reporting limit is elevated due to dilution for high concentrations of non-target analytes. (Nitrogen, Nitrate (As N))

Batch ID: R388294

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071204
Sample ID: 16EW03-210722 Lab ID:HS21071204-01
Collection Date: 22-Jul-2021 07:15 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	27-Jul-2021 19:49
1,1-Dichloroethene	5.0	U	2.0	5.0	10	ug/L	10	27-Jul-2021 19:49
1,2-Dichloroethane	5.0	U	2.0	5.0	10	ug/L	10	27-Jul-2021 19:49
cis-1,2-Dichloroethene	**1,500**		**2.0**	**5.0**	**10**	**ug/L**	10	27-Jul-2021 19:49
Methylene chloride	**15**	J	**4.0**	**10**	**20**	**ug/L**	10	27-Jul-2021 19:49
Trichloroethene	**77**		**2.0**	**5.0**	**10**	**ug/L**	10	27-Jul-2021 19:49
Vinyl chloride	**310**		**2.0**	**5.0**	**10**	**ug/L**	10	27-Jul-2021 19:49
Surr: 1,2-Dichloroethane-d4	*91.6*			**0**	*81-118*	*%REC*	*10*	*27-Jul-2021 19:49*
Surr: 4-Bromofluorobenzene	*94.3*			**0**	*85-114*	*%REC*	*10*	*27-Jul-2021 19:49*
Surr: Dibromofluoromethane	*95.1*			**0**	*80-119*	*%REC*	*10*	*27-Jul-2021 19:49*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*10*	*27-Jul-2021 19:49*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	30-Jul-2021 12:18
Ethene	**0.701**		**0.0234**	**0.0500**	**0.100**	**mg/L**	100	30-Jul-2021 13:51
Methane	**1.14**		**0.0107**	**0.0250**	**0.0500**	**mg/L**	100	30-Jul-2021 13:51
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**1,140**		**5.00**	**5.00**	**5.00**	**mg/L**	1	28-Jul-2021 21:11
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**14.8**		**0.500**	**1.00**	**1.00**	**mg/L**	1	05-Aug-2021 22:08
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**3.70**		**0.150**	**0.500**	**0.500**	**mg/L**	5	23-Jul-2021 14:08
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	23-Jul-2021 14:08
Sulfate	**1,350**		**10.0**	**25.0**	**25.0**	**mg/L**	50	26-Jul-2021 17:05
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	05-Aug-2021 17:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071204
Sample ID: 16IW10-210722 Lab ID:HS21071204-02
Collection Date: 22-Jul-2021 08:05 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	27-Jul-2021 13:51
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 13:51
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 13:51
cis-1,2-Dichloroethene	**19**		**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jul-2021 13:51
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	27-Jul-2021 13:51
Trichloroethene	**13**		**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jul-2021 13:51
Vinyl chloride	**1.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jul-2021 13:51
Surr: 1,2-Dichloroethane-d4	*91.6*			**0**	*81-118*	*%REC*	*1*	*27-Jul-2021 13:51*
Surr: 4-Bromofluorobenzene	*93.5*			**0**	*85-114*	*%REC*	*1*	*27-Jul-2021 13:51*
Surr: Dibromofluoromethane	*96.1*			**0**	*80-119*	*%REC*	*1*	*27-Jul-2021 13:51*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*1*	*27-Jul-2021 13:51*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	30-Jul-2021 12:28
Ethene	**0.00268**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	30-Jul-2021 12:28
Methane	**0.257**		**0.00107**	**0.00250**	**0.00500**	**mg/L**	10	30-Jul-2021 14:00
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**1,050**		**5.00**	**5.00**	**5.00**	**mg/L**	1	28-Jul-2021 20:53
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**630**		**10.0**	**20.0**	**20.0**	**mg/L**	20	06-Aug-2021 12:27
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**79.1**		**0.150**	**0.500**	**0.500**	**mg/L**	5	23-Jul-2021 14:15
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	23-Jul-2021 14:15
Sulfate	2.50	U	1.00	2.50	2.50	mg/L	5	23-Jul-2021 14:15
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	05-Aug-2021 17:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071204
Sample ID: 16IW03-210722 Lab ID:HS21071204-03
Collection Date: 22-Jul-2021 09:05 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	27-Jul-2021 19:07
1,1-Dichloroethene	**38**		**2.0**	**5.0**	**10**	**ug/L**	10	27-Jul-2021 19:07
1,2-Dichloroethane	**6.7**	J	**2.0**	**5.0**	**10**	**ug/L**	10	27-Jul-2021 19:07
cis-1,2-Dichloroethene	**10,000**		**20**	**50**	**100**	**ug/L**	100	03-Aug-2021 16:43
Methylene chloride	**16**	J	**4.0**	**10**	**20**	**ug/L**	10	27-Jul-2021 19:07
Trichloroethene	**8,100**		**20**	**50**	**100**	**ug/L**	100	03-Aug-2021 16:43
Vinyl chloride	**2,600**		**20**	**50**	**100**	**ug/L**	100	03-Aug-2021 16:43
Surr: 1,2-Dichloroethane-d4	*89.8*			**0**	*81-118*	*%REC*	*10*	*27-Jul-2021 19:07*
Surr: 1,2-Dichloroethane-d4	*91.7*			**0**	*81-118*	*%REC*	*100*	*03-Aug-2021 16:43*
Surr: 4-Bromofluorobenzene	*94.0*			**0**	*85-114*	*%REC*	*10*	*27-Jul-2021 19:07*
Surr: 4-Bromofluorobenzene	*99.9*			**0**	*85-114*	*%REC*	*100*	*03-Aug-2021 16:43*
Surr: Dibromofluoromethane	*95.8*			**0**	*80-119*	*%REC*	*10*	*27-Jul-2021 19:07*
Surr: Dibromofluoromethane	*91.6*			**0**	*80-119*	*%REC*	*100*	*03-Aug-2021 16:43*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*10*	*27-Jul-2021 19:07*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*100*	*03-Aug-2021 16:43*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	30-Jul-2021 12:39
Ethene	**1.64**		**0.0234**	**0.0500**	**0.100**	**mg/L**	100	30-Jul-2021 14:08
Methane	**2.93**		**0.0107**	**0.0250**	**0.0500**	**mg/L**	100	30-Jul-2021 14:08
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**1,580**		**5.00**	**5.00**	**5.00**	**mg/L**	1	28-Jul-2021 21:24
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**2,750**		**50.0**	**100**	**100**	**mg/L**	100	06-Aug-2021 13:29
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**3.30**		**0.150**	**0.500**	**0.500**	**mg/L**	5	23-Jul-2021 14:37
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	23-Jul-2021 14:37
Sulfate	**1.30**	J	**1.00**	**2.50**	**2.50**	**mg/L**	5	23-Jul-2021 14:37
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	05-Aug-2021 17:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071204
Sample ID: 16PM09-210722 Lab ID:HS21071204-04
Collection Date: 22-Jul-2021 11:05 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	**0.79**	J	**0.30**	**1.0**	**1.0**	**ug/L**	1	27-Jul-2021 18:46
1,1-Dichloroethene	**11**		**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jul-2021 18:46
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 18:46
cis-1,2-Dichloroethene	**200**		**1.0**	**2.5**	**5.0**	**ug/L**	5	03-Aug-2021 17:04
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	27-Jul-2021 18:46
Trichloroethene	**370**		**1.0**	**2.5**	**5.0**	**ug/L**	5	03-Aug-2021 17:04
Vinyl chloride	**9.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jul-2021 18:46
Surr: 1,2-Dichloroethane-d4	*91.9*			**0**	*81-118*	*%REC*	*1*	*27-Jul-2021 18:46*
Surr: 1,2-Dichloroethane-d4	*90.1*			**0**	*81-118*	*%REC*	*5*	*03-Aug-2021 17:04*
Surr: 4-Bromofluorobenzene	*91.5*			**0**	*85-114*	*%REC*	*1*	*27-Jul-2021 18:46*
Surr: 4-Bromofluorobenzene	*99.3*			**0**	*85-114*	*%REC*	*5*	*03-Aug-2021 17:04*
Surr: Dibromofluoromethane	*96.0*			**0**	*80-119*	*%REC*	*1*	*27-Jul-2021 18:46*
Surr: Dibromofluoromethane	*92.9*			**0**	*80-119*	*%REC*	*5*	*03-Aug-2021 17:04*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*27-Jul-2021 18:46*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*5*	*03-Aug-2021 17:04*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	05-Aug-2021 17:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071204
Sample ID: 16PM14-210722 Lab ID:HS21071204-05
Collection Date: 22-Jul-2021 11:50 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	03-Aug-2021 14:37
1,1-Dichloroethene	**15**		**2.0**	**5.0**	**10**	**ug/L**	10	03-Aug-2021 14:37
1,2-Dichloroethane	**21**		**2.0**	**5.0**	**10**	**ug/L**	10	03-Aug-2021 14:37
cis-1,2-Dichloroethene	**3,700**		**20**	**50**	**100**	**ug/L**	100	03-Aug-2021 16:22
Methylene chloride	10	U	4.0	10	20	ug/L	10	03-Aug-2021 14:37
Trichloroethene	**3,700**		**20**	**50**	**100**	**ug/L**	100	03-Aug-2021 16:22
Vinyl chloride	**110**		**2.0**	**5.0**	**10**	**ug/L**	10	03-Aug-2021 14:37
Surr: 1,2-Dichloroethane-d4	*91.9*			**0**	*81-118*	*%REC*	*10*	*03-Aug-2021 14:37*
Surr: 1,2-Dichloroethane-d4	*88.6*			**0**	*81-118*	*%REC*	*100*	*03-Aug-2021 16:22*
Surr: 4-Bromofluorobenzene	*98.0*			**0**	*85-114*	*%REC*	*10*	*03-Aug-2021 14:37*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*100*	*03-Aug-2021 16:22*
Surr: Dibromofluoromethane	*92.7*			**0**	*80-119*	*%REC*	*10*	*03-Aug-2021 14:37*
Surr: Dibromofluoromethane	*91.9*			**0**	*80-119*	*%REC*	*100*	*03-Aug-2021 16:22*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*10*	*03-Aug-2021 14:37*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*100*	*03-Aug-2021 16:22*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	05-Aug-2021 17:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071204
Sample ID: 16RW11-210722 Lab ID:HS21071204-06
Collection Date: 22-Jul-2021 12:35 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	27-Jul-2021 18:03
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 18:03
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 18:03
cis-1,2-Dichloroethene	**1.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jul-2021 18:03
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	27-Jul-2021 18:03
Trichloroethene	**2.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jul-2021 18:03
Vinyl chloride	**0.77**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jul-2021 18:03
Surr: 1,2-Dichloroethane-d4	*93.8*			**0**	*81-118*	*%REC*	*1*	*27-Jul-2021 18:03*
Surr: 4-Bromofluorobenzene	*92.4*			**0**	*85-114*	*%REC*	*1*	*27-Jul-2021 18:03*
Surr: Dibromofluoromethane	*97.8*			**0**	*80-119*	*%REC*	*1*	*27-Jul-2021 18:03*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*1*	*27-Jul-2021 18:03*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	05-Aug-2021 17:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071204
Sample ID: 16RW11-210722-FD Lab ID:HS21071204-07
Collection Date: 22-Jul-2021 12:35 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	27-Jul-2021 18:24
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 18:24
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 18:24
cis-1,2-Dichloroethene	**0.97**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jul-2021 18:24
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	27-Jul-2021 18:24
Trichloroethene	**2.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jul-2021 18:24
Vinyl chloride	**0.79**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jul-2021 18:24
Surr: 1,2-Dichloroethane-d4	*90.0*			**0**	*81-118*	*%REC*	*1*	*27-Jul-2021 18:24*
Surr: 4-Bromofluorobenzene	*95.0*			**0**	*85-114*	*%REC*	*1*	*27-Jul-2021 18:24*
Surr: Dibromofluoromethane	*95.9*			**0**	*80-119*	*%REC*	*1*	*27-Jul-2021 18:24*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*1*	*27-Jul-2021 18:24*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	05-Aug-2021 17:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071204
Sample ID: 16IW20-210722 Lab ID:HS21071204-08
Collection Date: 22-Jul-2021 13:15 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	27-Jul-2021 17:42
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 17:42
1,2-Dichloroethane	**0.56**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jul-2021 17:42
cis-1,2-Dichloroethene	**7.2**		**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jul-2021 17:42
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	27-Jul-2021 17:42
Trichloroethene	**7.6**		**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jul-2021 17:42
Vinyl chloride	**10**		**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jul-2021 17:42
Surr: 1,2-Dichloroethane-d4	*92.2*			**0**	*81-118*	*%REC*	*1*	*27-Jul-2021 17:42*
Surr: 4-Bromofluorobenzene	*92.5*			**0**	*85-114*	*%REC*	*1*	*27-Jul-2021 17:42*
Surr: Dibromofluoromethane	*94.9*			**0**	*80-119*	*%REC*	*1*	*27-Jul-2021 17:42*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*1*	*27-Jul-2021 17:42*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	30-Jul-2021 12:57
Ethene	**0.0160**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	30-Jul-2021 12:57
Methane	**2.17**		**0.0107**	**0.0250**	**0.0500**	**mg/L**	100	30-Jul-2021 14:38
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**429**		**5.00**	**5.00**	**5.00**	**mg/L**	1	28-Jul-2021 21:30
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**7.63**		**0.500**	**1.00**	**1.00**	**mg/L**	1	06-Aug-2021 13:41
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**6.43**		**0.150**	**0.500**	**0.500**	**mg/L**	5	23-Jul-2021 14:45
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	23-Jul-2021 14:45
Sulfate	**125**		**1.00**	**2.50**	**2.50**	**mg/L**	5	23-Jul-2021 14:45
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	05-Aug-2021 17:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071204
Sample ID: Trip Blank-210722 Lab ID:HS21071204-09
Collection Date: 22-Jul-2021 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	27-Jul-2021 17:21
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 17:21
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 17:21
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 17:21
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	27-Jul-2021 17:21
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 17:21
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jul-2021 17:21
Surr: 1,2-Dichloroethane-d4	*92.1*			**0**	*81-118*	*%REC*	*1*	*27-Jul-2021 17:21*
Surr: 4-Bromofluorobenzene	*89.7*			**0**	*85-114*	*%REC*	*1*	*27-Jul-2021 17:21*
Surr: Dibromofluoromethane	*96.8*			**0**	*80-119*	*%REC*	*1*	*27-Jul-2021 17:21*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*27-Jul-2021 17:21*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071204

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R388195 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** GW	
HS21071204-01	16EW03-210722	22 Jul 2021 07:15			23 Jul 2021 14:08	5
HS21071204-02	16IW10-210722	22 Jul 2021 08:05			23 Jul 2021 14:15	5
HS21071204-03	16IW03-210722	22 Jul 2021 09:05			23 Jul 2021 14:37	5
HS21071204-08	16IW20-210722	22 Jul 2021 13:15			23 Jul 2021 14:45	5
Batch ID: R388294 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** GW	
HS21071204-01	16EW03-210722	22 Jul 2021 07:15			26 Jul 2021 17:05	50
Batch ID: R388373 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21071204-09	Trip Blank-210722	22 Jul 2021 00:00			27 Jul 2021 17:21	1
Batch ID: R388373 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** GW	
HS21071204-01	16EW03-210722	22 Jul 2021 07:15			27 Jul 2021 19:49	10
HS21071204-02	16IW10-210722	22 Jul 2021 08:05			27 Jul 2021 13:51	1
HS21071204-03	16IW03-210722	22 Jul 2021 09:05			27 Jul 2021 19:07	10
HS21071204-04	16PM09-210722	22 Jul 2021 11:05			27 Jul 2021 18:46	1
HS21071204-06	16RW11-210722	22 Jul 2021 12:35			27 Jul 2021 18:03	1
HS21071204-07	16RW11-210722-FD	22 Jul 2021 12:35			27 Jul 2021 18:24	1
HS21071204-08	16IW20-210722	22 Jul 2021 13:15			27 Jul 2021 17:42	1
Batch ID: R388430 (0)	**Test Name :** ALKALINITY BY SM 2320B-2011				**Matrix:** GW	
HS21071204-01	16EW03-210722	22 Jul 2021 07:15			28 Jul 2021 21:11	1
HS21071204-02	16IW10-210722	22 Jul 2021 08:05			28 Jul 2021 20:53	1
HS21071204-03	16IW03-210722	22 Jul 2021 09:05			28 Jul 2021 21:24	1
HS21071204-08	16IW20-210722	22 Jul 2021 13:15			28 Jul 2021 21:30	1
Batch ID: R388610 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** GW	
HS21071204-01	16EW03-210722	22 Jul 2021 07:15			30 Jul 2021 13:51	100
HS21071204-01	16EW03-210722	22 Jul 2021 07:15			30 Jul 2021 12:18	1
HS21071204-02	16IW10-210722	22 Jul 2021 08:05			30 Jul 2021 14:00	10
HS21071204-02	16IW10-210722	22 Jul 2021 08:05			30 Jul 2021 12:28	1
HS21071204-03	16IW03-210722	22 Jul 2021 09:05			30 Jul 2021 14:08	100
HS21071204-03	16IW03-210722	22 Jul 2021 09:05			30 Jul 2021 12:39	1
HS21071204-08	16IW20-210722	22 Jul 2021 13:15			30 Jul 2021 14:38	100
HS21071204-08	16IW20-210722	22 Jul 2021 13:15			30 Jul 2021 12:57	1
Batch ID: R388821 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** GW	
HS21071204-03	16IW03-210722	22 Jul 2021 09:05			03 Aug 2021 16:43	100
HS21071204-04	16PM09-210722	22 Jul 2021 11:05			03 Aug 2021 17:04	5
HS21071204-05	16PM14-210722	22 Jul 2021 11:50			03 Aug 2021 16:22	100
HS21071204-05	16PM14-210722	22 Jul 2021 11:50			03 Aug 2021 14:37	10

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071204

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R388959 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** GW	
HS21071204-01	16EW03-210722	22 Jul 2021 07:15			05 Aug 2021 17:18	1
HS21071204-02	16IW10-210722	22 Jul 2021 08:05			05 Aug 2021 17:18	1
HS21071204-03	16IW03-210722	22 Jul 2021 09:05			05 Aug 2021 17:18	1
HS21071204-04	16PM09-210722	22 Jul 2021 11:05			05 Aug 2021 17:18	1
HS21071204-05	16PM14-210722	22 Jul 2021 11:50			05 Aug 2021 17:18	1
HS21071204-06	16RW11-210722	22 Jul 2021 12:35			05 Aug 2021 17:18	1
HS21071204-07	16RW11-210722-FD	22 Jul 2021 12:35			05 Aug 2021 17:18	1
HS21071204-08	16IW20-210722	22 Jul 2021 13:15			05 Aug 2021 17:18	1
Batch ID: R388982 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B-2011				**Matrix:** GW	
HS21071204-01	16EW03-210722	22 Jul 2021 07:15			05 Aug 2021 22:08	1
Batch ID: R389042 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B-2011				**Matrix:** GW	
HS21071204-02	16IW10-210722	22 Jul 2021 08:05			06 Aug 2021 12:27	20
HS21071204-03	16IW03-210722	22 Jul 2021 09:05			06 Aug 2021 13:29	100
HS21071204-08	16IW20-210722	22 Jul 2021 13:15			06 Aug 2021 13:41	1

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071204

QC BATCH REPORT

Batch ID: R388610 (0) **Instrument: FID-4** **Method: DISSOLVED GASES BY RSK-175**

MBLK Sample ID: **MBLK-210730** Units: **mg/L** Analysis Date: **30-Jul-2021 09:55**
Client ID: Run ID: **FID-4_388610** SeqNo: **6208821** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000250	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000250	0.000500								U

LCS Sample ID: **LCS-210730** Units: **mg/L** Analysis Date: **30-Jul-2021 10:05**
Client ID: Run ID: **FID-4_388610** SeqNo: **6208822** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0203	0.00100	0.01804	0	113	75 - 125				
Ethene	0.0175	0.00100	0.0168	0	104	75 - 125				
Methane	0.00983	0.000500	0.009647	0	102	75 - 125				

MS Sample ID: **HS21071204-02MS** Units: **mg/L** Analysis Date: **30-Jul-2021 14:47**
Client ID: **16IW10-210722** Run ID: **FID-4_388610** SeqNo: **6208843** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.00961	0.00100	0.01804	0	53.3	75 - 125				S
Ethene	0.0105	0.00100	0.0168	0.002684	46.3	75 - 125				S
Methane	0.205	0.000500	0.009647	0.2549	-517	75 - 125				SEO

MS Sample ID: **HS21071038-02MS** Units: **mg/L** Analysis Date: **30-Jul-2021 10:52**
Client ID: Run ID: **FID-4_388610** SeqNo: **6208826** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0166	0.00100	0.01804	0	92.2	75 - 125				
Ethene	0.0160	0.00100	0.0168	0.0007136	91.0	75 - 125				
Methane	0.00757	0.000500	0.009647	0.001677	61.0	75 - 125				S

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071204

QC BATCH REPORT

Batch ID: R388610 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MSD Sample ID: **HS21071204-02MSD** Units: **mg/L** Analysis Date: **30-Jul-2021 14:56**
Client ID: **16IW10-210722** Run ID: **FID-4_388610** SeqNo: **6208844** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.00943	0.00100	0.01804	0	52.3	75 - 125	0.009611	1.88	30	S
Ethene	0.0108	0.00100	0.0168	0.002684	48.1	75 - 125	0.01047	2.83	30	S
Methane	0.206	0.000500	0.009647	0.2549	-506	75 - 125	0.2051	0.523	30	SEO

MSD Sample ID: **HS21071038-02MSD** Units: **mg/L** Analysis Date: **30-Jul-2021 11:04**
Client ID: Run ID: **FID-4_388610** SeqNo: **6208827** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0166	0.00100	0.01804	0	91.8	75 - 125	0.01663	0.377	30	
Ethene	0.0161	0.00100	0.0168	0.0007136	91.8	75 - 125	0.01601	0.754	30	
Methane	0.00681	0.000500	0.009647	0.001677	53.2	75 - 125	0.007566	10.6	30	S

The following samples were analyzed in this batch: HS21071204-01 HS21071204-02 HS21071204-03 HS21071204-08

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071204

QC BATCH REPORT

Batch ID: R388373 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210727** Units: **ug/L** Analysis Date: **27-Jul-2021 11:44**
Client ID: Run ID: **VOA6_388373** SeqNo: **6203400** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.377	2.0								J
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.23*	*1.0*	*50*	*0*	*92.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*45.27*	*1.0*	*50*	*0*	*90.5*	*85 - 114*				
Surr: Dibromofluoromethane	*47.25*	*1.0*	*50*	*0*	*94.5*	*80 - 119*				
Surr: Toluene-d8	*55.76*	*1.0*	*50*	*0*	*112*	*89 - 112*				

LCS Sample ID: **VLCSW-210727** Units: **ug/L** Analysis Date: **27-Jul-2021 11:23**
Client ID: Run ID: **VOA6_388373** SeqNo: **6203399** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.48	1.0	20	0	92.4	80 - 119				
1,1-Dichloroethene	16.09	1.0	20	0	80.4	71 - 131				
1,2-Dichloroethane	18.75	1.0	20	0	93.8	73 - 128				
cis-1,2-Dichloroethene	18.46	1.0	20	0	92.3	78 - 123				
Methylene chloride	19.85	2.0	20	0	99.2	74 - 124				
Trichloroethene	19.91	1.0	20	0	99.5	79 - 123				
Vinyl chloride	16.28	1.0	20	0	81.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.36*	*1.0*	*50*	*0*	*96.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*46.74*	*1.0*	*50*	*0*	*93.5*	*85 - 114*				
Surr: Dibromofluoromethane	*49.95*	*1.0*	*50*	*0*	*99.9*	*80 - 119*				
Surr: Toluene-d8	*49.03*	*1.0*	*50*	*0*	*98.1*	*89 - 112*				

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071204

QC BATCH REPORT

Batch ID: R388373 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21071204-02MS** Units: **ug/L** Analysis Date: **27-Jul-2021 15:15**
Client ID: **16IW10-210722** Run ID: **VOA6_388373** SeqNo: **6203409** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.15	1.0	20	0	95.7	80 - 119				
1,1-Dichloroethene	15.81	1.0	20	0	79.0	71 - 131				
1,2-Dichloroethane	17.9	1.0	20	0	89.5	73 - 128				
cis-1,2-Dichloroethene	41.09	1.0	20	19.12	110	78 - 123				
Methylene chloride	19.15	2.0	20	0	95.8	74 - 124				
Trichloroethene	36.11	1.0	20	13.19	115	79 - 123				
Vinyl chloride	15.87	1.0	20	1.341	72.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.52*	*1.0*	*50*	*0*	*93.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.98*	*1.0*	*50*	*0*	*96.0*	*85 - 114*				
Surr: Dibromofluoromethane	*49.37*	*1.0*	*50*	*0*	*98.7*	*80 - 119*				
Surr: Toluene-d8	*53.46*	*1.0*	*50*	*0*	*107*	*89 - 112*				

MSD Sample ID: **HS21071204-02MSD** Units: **ug/L** Analysis Date: **27-Jul-2021 15:36**
Client ID: **16IW10-210722** Run ID: **VOA6_388373** SeqNo: **6203410** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.88	1.0	20	0	89.4	80 - 119	19.15	6.87	20	
1,1-Dichloroethene	14.7	1.0	20	0	73.5	71 - 131	15.81	7.28	20	
1,2-Dichloroethane	16.68	1.0	20	0	83.4	73 - 128	17.9	7.03	20	
cis-1,2-Dichloroethene	37.55	1.0	20	19.12	92.2	78 - 123	41.09	9.01	20	
Methylene chloride	18.06	2.0	20	0	90.3	74 - 124	19.15	5.86	20	
Trichloroethene	32.28	1.0	20	13.19	95.4	79 - 123	36.11	11.2	20	
Vinyl chloride	15.41	1.0	20	1.341	70.4	58 - 137	15.87	2.91	20	
Surr: 1,2-Dichloroethane-d4	*46.09*	*1.0*	*50*	*0*	*92.2*	*81 - 118*	*46.52*	*0.931*	*20*	
Surr: 4-Bromofluorobenzene	*47.57*	*1.0*	*50*	*0*	*95.1*	*85 - 114*	*47.98*	*0.869*	*20*	
Surr: Dibromofluoromethane	*48.87*	*1.0*	*50*	*0*	*97.7*	*80 - 119*	*49.37*	*1*	*20*	
Surr: Toluene-d8	*53.19*	*1.0*	*50*	*0*	*106*	*89 - 112*	*53.46*	*0.502*	*20*	

The following samples were analyzed in this batch:

HS21071204-01	HS21071204-02	HS21071204-03	HS21071204-04
HS21071204-06	HS21071204-07	HS21071204-08	HS21071204-09

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071204

QC BATCH REPORT

Batch ID: R388821 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210803** Units: **ug/L** Analysis Date: **03-Aug-2021 13:13**
Client ID: Run ID: **VOA6_388821** SeqNo: **6213698** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.87*	*1.0*	*50*	*0*	*89.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.36*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*45.8*	*1.0*	*50*	*0*	*91.6*	*80 - 119*				
Surr: Toluene-d8	*51.62*	*1.0*	*50*	*0*	*103*	*89 - 112*				

LCS Sample ID: **VLCSW-210803** Units: **ug/L** Analysis Date: **03-Aug-2021 12:09**
Client ID: Run ID: **VOA6_388821** SeqNo: **6213697** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.59	1.0	20	0	98.0	80 - 119				
1,1-Dichloroethene	16.91	1.0	20	0	84.6	71 - 131				
1,2-Dichloroethane	19.08	1.0	20	0	95.4	73 - 128				
cis-1,2-Dichloroethene	18.06	1.0	20	0	90.3	78 - 123				
Methylene chloride	19.21	2.0	20	0	96.0	74 - 124				
Trichloroethene	19.42	1.0	20	0	97.1	79 - 123				
Vinyl chloride	17.1	1.0	20	0	85.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.43*	*1.0*	*50*	*0*	*96.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.29*	*1.0*	*50*	*0*	*98.6*	*85 - 114*				
Surr: Dibromofluoromethane	*47.57*	*1.0*	*50*	*0*	*95.1*	*80 - 119*				
Surr: Toluene-d8	*46.87*	*1.0*	*50*	*0*	*93.7*	*89 - 112*				

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071204

QC BATCH REPORT

Batch ID: R388821 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21071731-01MS** Units: **ug/L** Analysis Date: **03-Aug-2021 14:58**
Client ID: Run ID: **VOA6_388821** SeqNo: **6213703** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.57	1.0	20	0	87.8	80 - 119				
1,1-Dichloroethene	18.16	1.0	20	0	90.8	71 - 131				
1,2-Dichloroethane	17.5	1.0	20	0	87.5	73 - 128				
cis-1,2-Dichloroethene	39.67	1.0	20	20.07	98.0	78 - 123				
Methylene chloride	17.12	2.0	20	0	85.6	74 - 124				
Trichloroethene	117.6	1.0	20	105.6	60.1	79 - 123				SO
Vinyl chloride	80.97	1.0	20	63.6	86.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.05*	*1.0*	*50*	*0*	*90.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.19*	*1.0*	*50*	*0*	*98.4*	*85 - 114*				
Surr: Dibromofluoromethane	*45.9*	*1.0*	*50*	*0*	*91.8*	*80 - 119*				
Surr: Toluene-d8	*51.24*	*1.0*	*50*	*0*	*102*	*89 - 112*				

MSD Sample ID: **HS21071731-01MSD** Units: **ug/L** Analysis Date: **03-Aug-2021 15:19**
Client ID: Run ID: **VOA6_388821** SeqNo: **6213704** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.26	1.0	20	0	86.3	80 - 119	17.57	1.79	20	
1,1-Dichloroethene	16.14	1.0	20	0	80.7	71 - 131	18.16	11.8	20	
1,2-Dichloroethane	15.83	1.0	20	0	79.2	73 - 128	17.5	9.99	20	
cis-1,2-Dichloroethene	35.36	1.0	20	20.07	76.5	78 - 123	39.67	11.5	20	S
Methylene chloride	16.01	2.0	20	0	80.1	74 - 124	17.12	6.71	20	
Trichloroethene	108	1.0	20	105.6	12.1	79 - 123	117.6	8.53	20	SO
Vinyl chloride	74.74	1.0	20	63.6	55.7	58 - 137	80.97	8	20	S
Surr: 1,2-Dichloroethane-d4	*45.74*	*1.0*	*50*	*0*	*91.5*	*81 - 118*	*45.05*	*1.51*	*20*	
Surr: 4-Bromofluorobenzene	*50.19*	*1.0*	*50*	*0*	*100*	*85 - 114*	*49.19*	*2.03*	*20*	
Surr: Dibromofluoromethane	*45.96*	*1.0*	*50*	*0*	*91.9*	*80 - 119*	*45.9*	*0.132*	*20*	
Surr: Toluene-d8	*51.95*	*1.0*	*50*	*0*	*104*	*89 - 112*	*51.24*	*1.39*	*20*	

The following samples were analyzed in this batch: HS21071204-03 HS21071204-04 HS21071204-05

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071204

QC BATCH REPORT

Batch ID: R388195 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **23-Jul-2021 12:05**
Client ID: Run ID: **ICS-Integrion_388195** SeqNo: **6199365** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS** Units: **mg/L** Analysis Date: **23-Jul-2021 12:12**
Client ID: Run ID: **ICS-Integrion_388195** SeqNo: **6199366** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	4.065	0.100	4	0	102	80 - 120				
Nitrogen, Nitrate (As N)	3.91	0.100	4	0	97.7	80 - 120				
Sulfate	18.79	0.500	20	0	94.0	80 - 120				

MS Sample ID: **HS21071204-02MS** Units: **mg/L** Analysis Date: **23-Jul-2021 14:22**
Client ID: **16IW10-210722** Run ID: **ICS-Integrion_388195** SeqNo: **6199381** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	89.29	0.500	10	79.11	102	80 - 120				O
Nitrogen, Nitrate (As N)	9.558	0.500	10	0	95.6	80 - 120				
Sulfate	43.46	2.50	50	0	86.9	80 - 120				

MS Sample ID: **HS21071183-13MS** Units: **mg/L** Analysis Date: **23-Jul-2021 13:10**
Client ID: Run ID: **ICS-Integrion_388195** SeqNo: **6199372** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.01	0.100	2	1.062	97.4	80 - 120				
Nitrogen, Nitrate (As N)	1.966	0.100	2	0.0084	97.9	80 - 120				
Sulfate	64.53	0.500	10	56.01	85.2	80 - 120				O

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071204

QC BATCH REPORT

Batch ID: R388195 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS21071204-02MSD** Units: **mg/L** Analysis Date: **23-Jul-2021 14:30**
Client ID: **16IW10-210722** Run ID: **ICS-Integrion_388195** SeqNo: **6199382** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	89.61	0.500	10	79.11	105	80 - 120	89.29	0.352	20	O
Nitrogen, Nitrate (As N)	9.6	0.500	10	0	96.0	80 - 120	9.558	0.433	20	
Sulfate	44.24	2.50	50	0	88.5	80 - 120	43.46	1.77	20	

MSD Sample ID: **HS21071183-13MSD** Units: **mg/L** Analysis Date: **23-Jul-2021 13:18**
Client ID: Run ID: **ICS-Integrion_388195** SeqNo: **6199373** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.075	0.100	2	1.062	101	80 - 120	3.01	2.12	20	
Nitrogen, Nitrate (As N)	1.965	0.100	2	0.0084	97.8	80 - 120	1.966	0.0254	20	
Sulfate	65	0.500	10	56.01	89.9	80 - 120	64.53	0.721	20	O

The following samples were analyzed in this batch: HS21071204-01 HS21071204-02 HS21071204-03 HS21071204-08

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071204

QC BATCH REPORT

Batch ID: R388294 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **26-Jul-2021 13:48**
Client ID: Run ID: **ICS-Integrion_388294** SeqNo: **6201452** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS** Units: **mg/L** Analysis Date: **26-Jul-2021 13:55**
Client ID: Run ID: **ICS-Integrion_388294** SeqNo: **6201453** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	18.93	0.500	20	0	94.6	80 - 120				

MS Sample ID: **HS21071096-01MS** Units: **mg/L** Analysis Date: **26-Jul-2021 17:34**
Client ID: Run ID: **ICS-Integrion_388294** SeqNo: **6201458** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	66.93	0.500	10	58.25	86.8	80 - 120				O

MSD Sample ID: **HS21071096-01MSD** Units: **mg/L** Analysis Date: **26-Jul-2021 17:42**
Client ID: Run ID: **ICS-Integrion_388294** SeqNo: **6201459** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	66.96	0.500	10	58.25	87.1	80 - 120	66.93	0.0478	20	O

The following samples were analyzed in this batch: HS21071204-01

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071204

QC BATCH REPORT

Batch ID: R388430 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM 2320B-2011**

MBLK Sample ID: **WBLKW1-210728** Units: **mg/L** Analysis Date: **28-Jul-2021 20:26**
Client ID: Run ID: **ManTech01_388430** SeqNo: **6204845** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **LCS1-210728** Units: **mg/L** Analysis Date: **28-Jul-2021 20:34**
Client ID: Run ID: **ManTech01_388430** SeqNo: **6204846** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1025	5.00	1000	0	103	85 - 115				

LCSD Sample ID: **LCSD1-210728** Units: **mg/L** Analysis Date: **28-Jul-2021 20:43**
Client ID: Run ID: **ManTech01_388430** SeqNo: **6204847** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1025	5.00	1000	0	102	85 - 115	1025	0.039	20	

DUP Sample ID: **HS21071204-02DUP** Units: **mg/L** Analysis Date: **28-Jul-2021 21:01**
Client ID: **16IW10-210722** Run ID: **ManTech01_388430** SeqNo: **6204849** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1019	5.00					1055	3.43	20	

The following samples were analyzed in this batch: HS21071204-01 HS21071204-02 HS21071204-03 HS21071204-08

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071204

QC BATCH REPORT

Batch ID: R388982 (0) **Instrument:** TOC_04 **Method:** TOTAL ORGANIC CARBON - SM5310B-2011

MBLK Sample ID: **MBLK-080521** Units: **mg/L** Analysis Date: **05-Aug-2021 19:28**
Client ID: Run ID: **TOC_04_388982** SeqNo: **6217283** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **LCS-08052021** Units: **mg/L** Analysis Date: **05-Aug-2021 19:40**
Client ID: Run ID: **TOC_04_388982** SeqNo: **6217284** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.47	1.00	10	0	105	85 - 115				

LCSD Sample ID: **LCSD-08052021** Units: **mg/L** Analysis Date: **05-Aug-2021 19:52**
Client ID: Run ID: **TOC_04_388982** SeqNo: **6217285** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.59	1.00	10	0	106	85 - 115	10.47	1.14	20	

MS Sample ID: **HS21071204-02MS** Units: **mg/L** Analysis Date: **05-Aug-2021 22:34**
Client ID: **16IW10-210722** Run ID: **TOC_04_388982** SeqNo: **6217293** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	724.2	1.00	10	708.7	155	80 - 120				SEO

The following samples were analyzed in this batch: HS21071204-01

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071204

QC BATCH REPORT

Batch ID: R389042 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B-2011**

MBLK Sample ID: **MBLK-080621** Units: **mg/L** Analysis Date: **06-Aug-2021 11:51**
Client ID: Run ID: **TOC_04_389042** SeqNo: **6218603** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **LCS-08062021** Units: **mg/L** Analysis Date: **06-Aug-2021 12:03**
Client ID: Run ID: **TOC_04_389042** SeqNo: **6218604** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.88	1.00	10	0	109	85 - 115				

LCSD Sample ID: **LCSD-08062021** Units: **mg/L** Analysis Date: **06-Aug-2021 12:15**
Client ID: Run ID: **TOC_04_389042** SeqNo: **6218605** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.25	1.00	10	0	102	85 - 115	10.88	5.96	20	

MS Sample ID: **HS21071204-02MS** Units: **mg/L** Analysis Date: **06-Aug-2021 12:39**
Client ID: **16IW10-210722** Run ID: **TOC_04_389042** SeqNo: **6218607** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	799.4	20.0	200	630	84.7	80 - 120				

The following samples were analyzed in this batch: HS21071204-02 HS21071204-03 HS21071204-08

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: **HS21071204**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	21-022-0	26-Mar-2022
Dept of Defense	PJLA L20-507-R2	22-Dec-2021
Florida	E87611-33	30-Jun-2022
Illinois	2000322021-7	09-May-2022
Kansas	E-10352 2021-2022	31-Jul-2022
Kentucky	123043, 2021-2022	30-Apr-2022
Louisiana	03087, 2021-2022	30-Jun-2022
North Carolina	624-2021	31-Dec-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-21-27	30-Apr-2022

ALS Houston, US Date: 09-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21071204

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS21071204-01	16EW03-210722	Login	7/23/2021 10:32:24 AM	PJM	WET230
HS21071204-01	16EW03-210722	Login	7/23/2021 10:32:24 AM	PJM	Sub
HS21071204-01	16EW03-210722	Login	7/23/2021 10:32:24 AM	PJM	VOA096
HS21071204-01	16EW03-210722	Login	7/23/2021 10:32:24 AM	PJM	RSK010
HS21071204-01	16EW03-210722	Login	7/23/2021 10:32:24 AM	PJM	WET238
HS21071204-02	16IW10-210722	Login	7/23/2021 10:32:24 AM	PJM	WET230
HS21071204-02	16IW10-210722	Login	7/23/2021 10:32:24 AM	PJM	Sub
HS21071204-02	16IW10-210722	Login	7/23/2021 10:32:24 AM	PJM	VOA096
HS21071204-02	16IW10-210722	Login	7/23/2021 10:32:24 AM	PJM	RSK010
HS21071204-02	16IW10-210722	Login	7/23/2021 10:32:24 AM	PJM	WET238
HS21071204-03	16IW03-210722	Login	7/23/2021 10:32:24 AM	PJM	WET230
HS21071204-03	16IW03-210722	Login	7/23/2021 10:32:24 AM	PJM	Sub
HS21071204-03	16IW03-210722	Login	7/23/2021 10:32:24 AM	PJM	VOA096
HS21071204-03	16IW03-210722	Login	7/23/2021 10:32:24 AM	PJM	RSK010
HS21071204-03	16IW03-210722	Login	7/23/2021 10:32:24 AM	PJM	WET238
HS21071204-04	16PM09-210722	Login	7/23/2021 10:32:24 AM	PJM	WET230
HS21071204-04	16PM09-210722	Login	7/23/2021 10:32:24 AM	PJM	Sub
HS21071204-04	16PM09-210722	Login	7/23/2021 10:32:24 AM	PJM	VOA096
HS21071204-04	16PM09-210722	Login	7/23/2021 10:32:24 AM	PJM	RSK010
HS21071204-04	16PM09-210722	Login	7/23/2021 10:32:24 AM	PJM	WET238
HS21071204-05	16PM14-210722	Login	7/23/2021 10:32:24 AM	PJM	Sub
HS21071204-05	16PM14-210722	Login	7/23/2021 10:32:24 AM	PJM	VOA096
HS21071204-06	16RW11-210722	Login	7/23/2021 10:32:24 AM	PJM	Sub
HS21071204-06	16RW11-210722	Login	7/23/2021 10:32:24 AM	PJM	VOA096
HS21071204-07	16RW11-210722-FD	Login	7/23/2021 10:32:24 AM	PJM	Sub
HS21071204-07	16RW11-210722-FD	Login	7/23/2021 10:32:24 AM	PJM	VOA096
HS21071204-08	16IW20-210722	Login	7/23/2021 10:32:24 AM	PJM	WET230
HS21071204-08	16IW20-210722	Login	7/23/2021 10:32:24 AM	PJM	Sub
HS21071204-08	16IW20-210722	Login	7/23/2021 10:32:24 AM	PJM	VOA096
HS21071204-08	16IW20-210722	Login	7/23/2021 10:32:24 AM	PJM	RSK010
HS21071204-08	16IW20-210722	Login	7/23/2021 10:32:24 AM	PJM	WET238
HS21071204-09	Trip Blank-210722	Login	7/23/2021 10:32:24 AM	PJM	VOA096

ALS Houston, US Date: 09-Aug-21

Sample Receipt Checklist

Work Order ID: HS21071204 **Date/Time Received:** 23-Jul-2021 09:00

Client Name: CBI-Houston **Received by:** Jared R. Makan

Completed By:	/S/ Pablo Marinez	23-Jul-2021 10:34	**Reviewed by:**	/S/ Ragen Giga	25-Jul-2021 13:22
	eSignature	Date/Time		eSignature	Date/Time

Matrices: **WATER** Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:CLIENT
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.5°C UC/C	IR 31
Cooler(s)/Kit(s):	47502	
Date/Time sample(s) sent to storage:	7/23/21 10:50	

Water - VOA vials have zero headspace?	Yes ☐	No ☑	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes: 16RW11-210722 - VOC vial 1 of 3 contains >6mm headspace

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Project: APTIM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 16 July 2021**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16EW03-210722	W6	7/22/21/0715		10	X	X	X	X	X	X						
16IW10-210722	W6	7/22/21/0805		10	X	X	X	X	X	X						
16IW10-210722-MS	W6	7/22/21/0805		10	X	X	X	X	X	X						
16IW10-210722-MSD	W6	7/22/21/0805		10	X	X	X	X	X	X						
16IW03-210722	W6	7/22/21/0905		10	X	X	X	X	X	X						
16PM09-210722	W6	7/22/21/1105		4	X					X						
16PM14-210722	W6	7/22/21/1150		4	X					X						
16RW11-210722	W6	7/22/21/1235		4	X					X						

HS21071204

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant LHAAP 16 July 20

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	7/22/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Mannan	7/23/21	09:02							

Remarks: Cooler 49502 IR#1
Temp 1-5 C COC

(Word) S:\1-cer\Forms\Chain of Custody - BiWeekly

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Project: APTIM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 16 July 2021**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16RW11-210722-FD	W6	7/22/21/1235		4	X					X						
16IW20-210722	W6	7/22/21/1315		10	X	X	X	X	X	X						
TRIP BLANK-210722	W6															

HS21071204

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant LHAAP 16 July 20

Additional Remarks: **Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com**

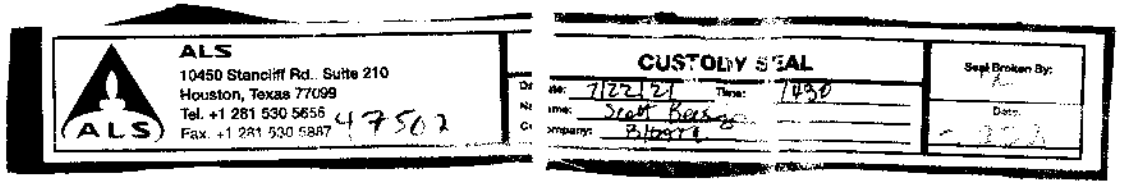
Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	7/22/21	1430									

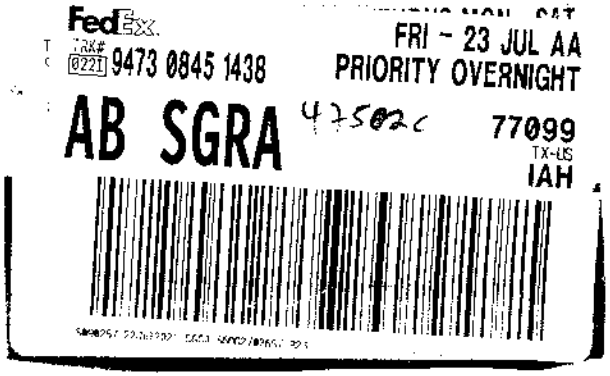
For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
[illegible]	7/23/21	09:30							

Remarks:

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly


ALS
10450 Stanciff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
47502
CUSTODY SEAL
Seal Broken By:
Date:
Time:
Scott Berg
Bloom


FedEx
TRK#
0221 9473 0845 1438
FRI - 23 JUL AA
PRIORITY OVERNIGHT
AB SGRA
47502c
77099
TX-US
IAH

August 05, 2021 Service Request No:E2100825

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

Laboratory Results for: HS21071204

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory July 23, 2021
For your reference, these analyses have been assigned our service request number **E2100825.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental



Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100825
Project:	HS21071204	**Date Received:**	07/23/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Eight samples were received for analysis at ALS Environmental in Houston on 07/23/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100458: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch. The LCS & DLCS recoveries are within QC limits. The MS and MSD (E2100825-002) recoveries were recovered above the upper control limit.

DoD certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2100825
Project: HS21071204

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100825-001	16EW03-210722	7/22/2021	0715
E2100825-002	16IW10-210722	7/22/2021	0805
E2100825-003	16IW03-210722	7/22/2021	0905
E2100825-004	16PM09-210722	7/22/2021	1105
E2100825-005	16PM14-210722	7/22/2021	1150
E2100825-006	16RW11-210722	7/22/2021	1235
E2100825-007	16RW11-210722-FD	7/22/2021	1235
E2100825-008	16IW20-210722	7/22/2021	1315

Service Request Summary

Folder #: **E2100825**
Client Name: ALS Environmental - US
Project Name: HS21071204
Project Number:

Report To: Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 07/23/21
Internal Due Date: 8/6/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21071204
EDD: No EDD Specified

10 125 mL-Plastic Bottle Plastic
Location: EHRMS-AirArch 1
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100825-001	16EW03-210722	Ground Water	07/22/21 0715	**IV**
E2100825-002	16IW10-210722	Ground Water	07/22/21 0805	**IV**
E2100825-003	16IW03-210722	Ground Water	07/22/21 0905	**IV**
E2100825-004	16PM09-210722	Ground Water	07/22/21 1105	**IV**
E2100825-005	16PM14-210722	Ground Water	07/22/21 1150	**IV**
E2100825-006	16RW11-210722	Ground Water	07/22/21 1235	**IV**
E2100825-007	16RW11-210722-FD	Ground Water	07/22/21 1235	**IV**
E2100825-008	16IW20-210722	Ground Water	07/22/21 1315	**IV**

Service Request Summary

Folder #: **E2100825**
Client Name: ALS Environmental - US
Project Name: HS21071204
Project Number:

Report To: Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 07/23/21
Internal Due Date: 8/6/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21071204
EDD: No EDD Specified

10 125 mL-Plastic Bottle Plastic
Location: EHRMS-AirArch 1
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	7	Level IV due 8/13
Semivoa GCMS	ClO4 DOD/6850	1	MS/MSD

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arkansas Department of Environmental Quality	21-022-0	3/26/2022
Arkansas Department of Environmental Quality	19-028-0	6/30/2022
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-33	6/30/2022
Hawaii Department of Health	2021-2022	4/30/2022
Kansas Department of Health and Environment	E-10352 2022	7/31/2022
Louisiana Department of Environmental Quality	03087-2021	6/30/2022
Louisiana Department of Health and Hospitals	LA028-2021	12/31/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Minnesota Department of Health	2021671	12/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209421	4/24/2022
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	68-03441-015	6/30/2022
Tennessee Department of Environment and Concervation	04016-2021	4/30/2022
Texas Commision on Environmental Quality	T104704231-21-27	4/30/2022
United States Department of Agriculture	P330-19-00299	10/10/2022

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 16547**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	Ragen Giga
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RagenP.Giga@ALSGlobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS21071204
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21071204-01**	**16EW03-210722**	**GW**	**22 Jul 2021 07:15**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			06 Aug 2021
2.	**HS21071204-02**	**16IW10-210722**	**GW**	**22 Jul 2021 08:05**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			06 Aug 2021
3.	**HS21071204-03**	**16IW03-210722**	**GW**	**22 Jul 2021 09:05**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			06 Aug 2021
4.	**HS21071204-04**	**16PM09-210722**	**GW**	**22 Jul 2021 11:05**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			06 Aug 2021
5.	**HS21071204-05**	**16PM14-210722**	**GW**	**22 Jul 2021 11:50**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			06 Aug 2021
6.	**HS21071204-06**	**16RW11-210722**	**GW**	**22 Jul 2021 12:35**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			06 Aug 2021
7.	**HS21071204-07**	**16RW11-210722-FD**	**GW**	**22 Jul 2021 12:35**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			06 Aug 2021
8.	**HS21071204-08**	**16IW20-210722**	**GW**	**22 Jul 2021 13:15**

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 16547**

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.		06 Aug 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 7/23/21 10:50

Received By: COREY G Date/Time: 7/23/21 10:50

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

Cooler Receipt Form

Project Chemist CG

Client/Project ALS-H

Thermometer ID 1231

Date/Time Received: 7/23/21 Initials: CG Date/Time Logged in: 7/23/21 Initials CG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ ALS Courier ○ Client

2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ✓ No If yes, how many and where?

Were they intact? ○ Yes ○ No ✓ N/A

Were they signed and dated? ○ Yes ○ No ✓ N/A

4. Packing Material: ○ Inserts ✓ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		7/23/21	1050	CG	4.4	☑
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No

7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No

8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No

9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No

10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

ALS Environmental - Houston HRMS

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 383906 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 7/30/21 10:15

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100824-001	MOSA-21-231359	.01	6850/ClO4 DOD			Water	10mL	
2	E2100824-002	MOSA-21-231360	.01	6850/ClO4 DOD			Water	10mL	
3	E2100824-003	MOSA-21-231361	.01	6850/ClO4 DOD			Water	10mL	
4	E2100825-001	16EW03-210722	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100825-002	16IW10-210722	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100825-003	16IW03-210722	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100825-004	16PM09-210722	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2100825-005	16PM14-210722	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2100825-006	16RW11-210722	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2100825-007	16RW11-210722-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2100825-008	16IW20-210722	.01	6850/ClO4 DOD			Ground Water	10mL	
12	EQ2100458-01	MB		6850/ClO4 DOD			Liquid	10mL	
13	EQ2100458-02	LCS		6850/ClO4 DOD			Liquid	10mL	
14	EQ2100458-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
15	EQ2100458-04	16IW10-210722 MS	.01	6850/ClO4 DOD			Liquid	10mL	
16	EQ2100458-05	16IW10-210722 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 214765 Logbook Ref: Sodium Perchlorate Expires On: 12/11/2022

E2100824-001	100.00µL	E2100824-002	100.00µL	E2100824-003	100.00µL	E2100825-001	100.00µL	E2100825-002	100.00µL	E2100825-003	100.00µL
E2100825-004	100.00µL	E2100825-005	100.00µL	E2100825-006	100.00µL	E2100825-007	100.00µL	E2100825-008	100.00µL	EQ2100458-01	100.00µL
EQ2100458-02	100.00µL	EQ2100458-03	100.00µL	EQ2100458-04	100.00µL	EQ2100458-05	100.00µL				

Name: Perchlorate Intermediate Stock1 Inventory ID 217422 Logbook Ref: Perchlorate Expires On: 11/26/2021

EQ2100458-02	1.00µL	EQ2100458-03	1.00µL	EQ2100458-04	1.00µL	EQ2100458-05	1.00µL

Preparation Materials

Water HPLC Grade 07/01/2021 Water (217918) 537M Glass Culture Tubes 537M Glass Tubes (218064)

Preparation Steps

Step: Preparation
Started: 7/30/21 10:15
Finished: 7/30/21 11:15
By: GRIVERA
Comments

Preparation Information Benchsheet

Prep Run#: 383906
Team: Semivoa GCMS/GRIVERA

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 7/30/21 10:15

Comments:

Reviewed By: GR Date: 7/30/21

Chain of Custody

Relinquished By:		Date:		Extracts Examined
Received By:		Date:		Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100825
Project:	HS21071204	**Date Collected:**	7/22/21 0715
Sample Matrix:	Ground Water	**Date Received:**	7/23/21
Sample Name:	16EW03-210722	**Units:**	µg/L
Lab Code:	E2100825-001	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	7/30/21	8/5/21 13:51	383906	733725	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100825
Project:	HS21071204	**Date Collected:**	7/22/21 0805
Sample Matrix:	Ground Water	**Date Received:**	7/23/21
Sample Name:	16IW10-210722	**Units:**	µg/L
Lab Code:	E2100825-002	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.200	0.100	0.0500	2	7/30/21	8/5/21 12:12	383906	733725	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100825
Project:	HS21071204	**Date Collected:**	7/22/21 0905
Sample Matrix:	Ground Water	**Date Received:**	7/23/21
Sample Name:	16IW03-210722	**Units:**	µg/L
Lab Code:	E2100825-003	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	7/30/21	8/5/21 14:35	383906	733725	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100825
Project:	HS21071204	**Date Collected:**	7/22/21 1105
Sample Matrix:	Ground Water	**Date Received:**	7/23/21
Sample Name:	16PM09-210722	**Units:**	µg/L
Lab Code:	E2100825-004	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	7/30/21	8/2/21 22:07	383906	733464	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100825
Project:	HS21071204	**Date Collected:**	7/22/21 1150
Sample Matrix:	Ground Water	**Date Received:**	7/23/21
Sample Name:	16PM14-210722	**Units:**	µg/L
Lab Code:	E2100825-005	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	7/30/21	8/5/21 14:00	383906	733725	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100825
Project:	HS21071204	**Date Collected:**	7/22/21 1235
Sample Matrix:	Ground Water	**Date Received:**	7/23/21
Sample Name:	16RW11-210722	**Units:**	µg/L
Lab Code:	E2100825-006	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	7/30/21	8/5/21 13:11	383906	733725	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100825
Project:	HS21071204	**Date Collected:**	7/22/21 1235
Sample Matrix:	Ground Water	**Date Received:**	7/23/21
Sample Name:	16RW11-210722-FD	**Units:**	µg/L
Lab Code:	E2100825-007	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	7/30/21	8/5/21 13:20	383906	733725	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100825
Project:	HS21071204	**Date Collected:**	7/22/21 1315
Sample Matrix:	Ground Water	**Date Received:**	7/23/21
Sample Name:	16IW20-210722	**Units:**	µg/L
Lab Code:	E2100825-008	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	7/30/21	8/5/21 13:28	383906	733725	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100825
Project:	HS21071204	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100458-01	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	7/30/21	8/2/21 20:25	383906	733464	

Accuracy & Precision

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ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100825
Project:	HS21071204	**Date Analyzed:**	8/ 2/21
Sample Matrix:	Ground Water		

Lab Control Sample Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	As Received
		Extraction Lot:	383906

	Lab Control Sample EQ2100458-02			Duplicate Lab Control Sample EQ2100458-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.118	0.100	118	0.119	0.100	119	84 - 119	<1	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100825
Project:	HS21071204	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100458-02	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.118**		0.100	0.0500	0.0250	1	7/30/21	8/2/21 20:34	383906	733464	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100825
Project:	HS21071204	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100458-03	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.119**		0.100	0.0500	0.0250	1	7/30/21	8/2/21 20:42	383906	733464	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100825
Project:	HS21071204	**Date Collected:**	7/22/21
Sample Matrix:	Ground Water	**Date Received:**	7/23/21
		Date Analyzed:	8/ 5/21

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	16IW10-210722	**Units:**	µg/L
Lab Code:	E2100825-002	**Basis:**	As Received

Analytical Method: 6850
Prep Method: Method

		16IW10-210722MS				16IW10-210722DMS					
		Matrix Spike				**Duplicate Matrix Spike**					
		EQ2100458-04				EQ2100458-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**		**Result**	**Spike Amount**	**% Rec**		**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	ND	0.134	0.100	134	*	0.128	0.100	128	*	84 - 119	5	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100825
Project:	HS21071204	**Date Collected:**	7/22/21 0805
Sample Matrix:	Ground Water	**Date Received:**	7/23/21
Sample Name:	16IW10-210722	**Units:**	µg/L
Lab Code:	EQ2100458-04	**Basis:**	As Received
Run Type:	Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.134**	J	0.200	0.100	0.0500	2	7/30/21	8/5/21 15:32	383906	733725	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100825
Project:	HS21071204	**Date Collected:**	7/22/21 0805
Sample Matrix:	Ground Water	**Date Received:**	7/23/21
Sample Name:	16IW10-210722	**Units:**	µg/L
Lab Code:	EQ2100458-05	**Basis:**	As Received
Run Type:	Duplicate Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.128**	J	0.200	0.100	0.0500	2	7/30/21	8/5/21 15:50	383906	733725	

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Houston, TX 77099
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August 10, 2021

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
10333 Richmond Ave
Ste 1030
Houston, TX 77042

Work Order: **HS21071405**

Laboratory Results for: **Longhorn Army Ammunition Plant LHAAP 16 July 2021**

Dear Vicki Graves ,

ALS Environmental received 13 sample(s) on Jul 27, 2021 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Ragen Giga
Project Manager

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21071405

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21071405-01	16EW02-210726	GW		26-Jul-2021 07:35	27-Jul-2021 09:15	☐
HS21071405-02	16EW04-210726	GW		26-Jul-2021 08:20	27-Jul-2021 09:15	☐
HS21071405-03	16EW08-210726	GW		26-Jul-2021 09:05	27-Jul-2021 09:15	☐
HS21071405-04	16RW04-210726	GW		26-Jul-2021 09:50	27-Jul-2021 09:15	☐
HS21071405-05	16RW01-210726	GW		26-Jul-2021 10:30	27-Jul-2021 09:15	☐
HS21071405-06	16RW02-210726	GW		26-Jul-2021 11:15	27-Jul-2021 09:15	☐
HS21071405-07	16WW13-210726	GW		26-Jul-2021 12:00	27-Jul-2021 09:15	☐
HS21071405-08	16WW42-210726	GW		26-Jul-2021 12:40	27-Jul-2021 09:15	☐
HS21071405-09	16SW01-210726	GW		26-Jul-2021 13:00	27-Jul-2021 09:15	☐
HS21071405-10	16SW01-210726-FD	GW		26-Jul-2021 13:00	27-Jul-2021 09:15	☐
HS21071405-11	16SW02-210726	GW		26-Jul-2021 13:20	27-Jul-2021 09:15	☐
HS21071405-12	16SW03-210726	GW		26-Jul-2021 13:50	27-Jul-2021 09:15	☐
HS21071405-13	Trip Blank-210726	Water	CG-061121-200	26-Jul-2021 00:00	27-Jul-2021 09:15	☐

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21071405

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston Specialty Lab. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R388610

Sample ID: HS21071038-02MS

- MS and MSD are for an unrelated sample

Sample ID: HS21071204-02MS

- MS and MSD are for an unrelated sample

GCMS Volatiles by Method SW8260

Batch ID: R388821

Sample ID: HS21071731-01MS

- MS and MSD are for an unrelated sample

Batch ID: R388888

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020A

Batch ID: 168892

Sample ID: 16SW02-210726 (HS21071405-11MS)

- The MS and/or MSD recovery was outside of the control limits; however, the result in the parent sample is greater than 4x the spike amount. (Manganese)

Sample ID: 16SW02-210726 (HS21071405-11PDS)

- The PDS recovery was outside method control limits, however the result in the parent sample is greater than 4x the spike amount. (Manganese)

WetChemistry by Method SM5310B

Batch ID: R389176

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071405
Sample ID: 16EW02-210726 Lab ID:HS21071405-01
Collection Date: 26-Jul-2021 07:35 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	25	U	7.5	25	25	ug/L	25	03-Aug-2021 20:56
1,1-Dichloroethene	**58**		**5.0**	**12**	**25**	**ug/L**	25	03-Aug-2021 20:56
1,2-Dichloroethane	**29**		**5.0**	**12**	**25**	**ug/L**	25	03-Aug-2021 20:56
cis-1,2-Dichloroethene	**18,000**		**50**	**120**	**250**	**ug/L**	250	03-Aug-2021 21:17
Methylene chloride	25	U	10	25	50	ug/L	25	03-Aug-2021 20:56
Trichloroethene	**25,000**		**50**	**120**	**250**	**ug/L**	250	03-Aug-2021 21:17
Vinyl chloride	**42**		**5.0**	**12**	**25**	**ug/L**	25	03-Aug-2021 20:56
Surr: 1,2-Dichloroethane-d4	*91.4*			**0**	*81-118*	*%REC*	*25*	*03-Aug-2021 20:56*
Surr: 1,2-Dichloroethane-d4	*91.2*			**0**	*81-118*	*%REC*	*250*	*03-Aug-2021 21:17*
Surr: 4-Bromofluorobenzene	*97.8*			**0**	*85-114*	*%REC*	*25*	*03-Aug-2021 20:56*
Surr: 4-Bromofluorobenzene	*97.3*			**0**	*85-114*	*%REC*	*250*	*03-Aug-2021 21:17*
Surr: Dibromofluoromethane	*92.4*			**0**	*80-119*	*%REC*	*250*	*03-Aug-2021 21:17*
Surr: Dibromofluoromethane	*93.6*			**0**	*80-119*	*%REC*	*25*	*03-Aug-2021 20:56*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*25*	*03-Aug-2021 20:56*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*250*	*03-Aug-2021 21:17*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	05-Aug-2021 12:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071405
Sample ID: 16EW04-210726 Lab ID:HS21071405-02
Collection Date: 26-Jul-2021 08:20 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	04-Aug-2021 18:48
1,1-Dichloroethene	**3.2**	J	**1.0**	**2.5**	**5.0**	**ug/L**	5	04-Aug-2021 18:48
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	ug/L	5	04-Aug-2021 18:48
cis-1,2-Dichloroethene	**640**		**1.0**	**2.5**	**5.0**	**ug/L**	5	04-Aug-2021 18:48
Methylene chloride	5.0	U	2.0	5.0	10	ug/L	5	04-Aug-2021 18:48
Trichloroethene	**3,100**		**5.0**	**12**	**25**	**ug/L**	25	04-Aug-2021 19:09
Vinyl chloride	**2.5**	J	**1.0**	**2.5**	**5.0**	**ug/L**	5	04-Aug-2021 18:48
Surr: 1,2-Dichloroethane-d4	*94.1*			**0**	*81-118*	*%REC*	*5*	*04-Aug-2021 18:48*
Surr: 1,2-Dichloroethane-d4	*96.8*			**0**	*81-118*	*%REC*	*25*	*04-Aug-2021 19:09*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*5*	*04-Aug-2021 18:48*
Surr: 4-Bromofluorobenzene	*96.2*			**0**	*85-114*	*%REC*	*25*	*04-Aug-2021 19:09*
Surr: Dibromofluoromethane	*96.2*			**0**	*80-119*	*%REC*	*25*	*04-Aug-2021 19:09*
Surr: Dibromofluoromethane	*92.1*			**0**	*80-119*	*%REC*	*5*	*04-Aug-2021 18:48*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*5*	*04-Aug-2021 18:48*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*25*	*04-Aug-2021 19:09*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	05-Aug-2021 12:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071405
Sample ID: 16EW08-210726 Lab ID:HS21071405-03
Collection Date: 26-Jul-2021 09:05 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	03-Aug-2021 18:49
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 18:49
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 18:49
cis-1,2-Dichloroethene	**1.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	03-Aug-2021 18:49
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	03-Aug-2021 18:49
Trichloroethene	**1.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	03-Aug-2021 18:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 18:49
Surr: 1,2-Dichloroethane-d4	*89.8*			**0**	*81-118*	*%REC*	*1*	*03-Aug-2021 18:49*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*03-Aug-2021 18:49*
Surr: Dibromofluoromethane	*94.1*			**0**	*80-119*	*%REC*	*1*	*03-Aug-2021 18:49*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*03-Aug-2021 18:49*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	05-Aug-2021 12:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071405
Sample ID: 16RW04-210726 Lab ID:HS21071405-04
Collection Date: 26-Jul-2021 09:50 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	04-Aug-2021 14:15
1,1-Dichloroethene	**1.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Aug-2021 14:15
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	04-Aug-2021 14:15
cis-1,2-Dichloroethene	**80**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Aug-2021 14:15
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	04-Aug-2021 14:15
Trichloroethene	**1,200**		**5.0**	**12**	**25**	**ug/L**	25	04-Aug-2021 15:18
Vinyl chloride	**2.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Aug-2021 14:15
Surr: 1,2-Dichloroethane-d4	*98.5*			**0**	*81-118*	*%REC*	*1*	*04-Aug-2021 14:15*
Surr: 1,2-Dichloroethane-d4	*95.1*			**0**	*81-118*	*%REC*	*25*	*04-Aug-2021 15:18*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*04-Aug-2021 14:15*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*25*	*04-Aug-2021 15:18*
Surr: Dibromofluoromethane	*95.6*			**0**	*80-119*	*%REC*	*1*	*04-Aug-2021 14:15*
Surr: Dibromofluoromethane	*95.3*			**0**	*80-119*	*%REC*	*25*	*04-Aug-2021 15:18*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*04-Aug-2021 14:15*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*25*	*04-Aug-2021 15:18*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	05-Aug-2021 12:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071405
Sample ID: 16RW01-210726 Lab ID:HS21071405-05
Collection Date: 26-Jul-2021 10:30 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	04-Aug-2021 20:12
1,1-Dichloroethene	2.5	U	1.0	2.5	5.0	ug/L	5	04-Aug-2021 20:12
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	ug/L	5	04-Aug-2021 20:12
cis-1,2-Dichloroethene	**84**		**1.0**	**2.5**	**5.0**	**ug/L**	5	04-Aug-2021 20:12
Methylene chloride	5.0	U	2.0	5.0	10	ug/L	5	04-Aug-2021 20:12
Trichloroethene	**2,300**		**10**	**25**	**50**	**ug/L**	50	04-Aug-2021 20:34
Vinyl chloride	2.5	U	1.0	2.5	5.0	ug/L	5	04-Aug-2021 20:12
Surr: 1,2-Dichloroethane-d4	*95.0*			**0**	*81-118*	*%REC*	*5*	*04-Aug-2021 20:12*
Surr: 1,2-Dichloroethane-d4	*94.3*			**0**	*81-118*	*%REC*	*50*	*04-Aug-2021 20:34*
Surr: 4-Bromofluorobenzene	*100.0*			**0**	*85-114*	*%REC*	*5*	*04-Aug-2021 20:12*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*50*	*04-Aug-2021 20:34*
Surr: Dibromofluoromethane	*96.4*			**0**	*80-119*	*%REC*	*5*	*04-Aug-2021 20:12*
Surr: Dibromofluoromethane	*97.0*			**0**	*80-119*	*%REC*	*50*	*04-Aug-2021 20:34*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*5*	*04-Aug-2021 20:12*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*50*	*04-Aug-2021 20:34*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	05-Aug-2021 12:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071405
Sample ID: 16RW02-210726 Lab ID:HS21071405-06
Collection Date: 26-Jul-2021 11:15 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	03-Aug-2021 19:10
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 19:10
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 19:10
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 19:10
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	03-Aug-2021 19:10
Trichloroethene	**2.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	03-Aug-2021 19:10
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 19:10
Surr: 1,2-Dichloroethane-d4	*89.6*			**0**	*81-118*	*%REC*	*1*	*03-Aug-2021 19:10*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*03-Aug-2021 19:10*
Surr: Dibromofluoromethane	*93.1*			**0**	*80-119*	*%REC*	*1*	*03-Aug-2021 19:10*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*03-Aug-2021 19:10*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	05-Aug-2021 12:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071405
Sample ID: 16WW13-210726 Lab ID:HS21071405-07
Collection Date: 26-Jul-2021 12:00 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	04-Aug-2021 19:30
1,1-Dichloroethene	2.5	U	1.0	2.5	5.0	ug/L	5	04-Aug-2021 19:30
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	ug/L	5	04-Aug-2021 19:30
cis-1,2-Dichloroethene	**560**		**1.0**	**2.5**	**5.0**	**ug/L**	5	04-Aug-2021 19:30
Methylene chloride	5.0	U	2.0	5.0	10	ug/L	5	04-Aug-2021 19:30
Trichloroethene	**1,500**		**5.0**	**12**	**25**	**ug/L**	25	04-Aug-2021 19:51
Vinyl chloride	**9.6**		**1.0**	**2.5**	**5.0**	**ug/L**	5	04-Aug-2021 19:30
Surr: 1,2-Dichloroethane-d4	*95.3*			**0**	*81-118*	*%REC*	*25*	*04-Aug-2021 19:51*
Surr: 1,2-Dichloroethane-d4	*94.3*			**0**	*81-118*	*%REC*	*5*	*04-Aug-2021 19:30*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*5*	*04-Aug-2021 19:30*
Surr: 4-Bromofluorobenzene	*98.6*			**0**	*85-114*	*%REC*	*25*	*04-Aug-2021 19:51*
Surr: Dibromofluoromethane	*93.5*			**0**	*80-119*	*%REC*	*25*	*04-Aug-2021 19:51*
Surr: Dibromofluoromethane	*95.2*			**0**	*80-119*	*%REC*	*5*	*04-Aug-2021 19:30*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*5*	*04-Aug-2021 19:30*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*25*	*04-Aug-2021 19:51*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	05-Aug-2021 12:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071405
Sample ID: 16WW42-210726 Lab ID:HS21071405-08
Collection Date: 26-Jul-2021 12:40 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	03-Aug-2021 20:35
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 20:35
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 20:35
cis-1,2-Dichloroethene	**67**		**0.20**	**0.50**	**1.0**	**ug/L**	1	03-Aug-2021 20:35
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	03-Aug-2021 20:35
Trichloroethene	**1.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	03-Aug-2021 20:35
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 20:35
Surr: 1,2-Dichloroethane-d4	*93.1*			**0**	*81-118*	*%REC*	*1*	*03-Aug-2021 20:35*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*03-Aug-2021 20:35*
Surr: Dibromofluoromethane	*93.1*			**0**	*80-119*	*%REC*	*1*	*03-Aug-2021 20:35*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*03-Aug-2021 20:35*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	30-Jul-2021 15:33
Ethene	**0.000830**	J	**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	30-Jul-2021 15:33
Methane	**0.00517**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	30-Jul-2021 15:33
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**5.52**		**0.500**	**1.00**	**1.00**	**mg/L**	1	10-Aug-2021 12:23
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	05-Aug-2021 12:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastructure, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071405
Sample ID: 16SW01-210726 Lab ID:HS21071405-09
Collection Date: 26-Jul-2021 13:00 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	03-Aug-2021 19:31
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 19:31
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 19:31
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 19:31
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	03-Aug-2021 19:31
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 19:31
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 19:31
Surr: 1,2-Dichloroethane-d4	*90.3*			**0**	*81-118*	*%REC*	*1*	*03-Aug-2021 19:31*
Surr: 4-Bromofluorobenzene	*99.6*			**0**	*85-114*	*%REC*	*1*	*03-Aug-2021 19:31*
Surr: Dibromofluoromethane	*93.7*			**0**	*80-119*	*%REC*	*1*	*03-Aug-2021 19:31*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*03-Aug-2021 19:31*
METALS BY ICPMS BY SW6020A		**Method:SW6020A**				Prep:SW3010A / 09-Aug-2021		Analyst: JHD
Arsenic	**0.00140**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	09-Aug-2021 19:28
Chromium	**0.00106**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	09-Aug-2021 19:28
Manganese	**0.313**		**0.000700**	**0.00250**	**0.00500**	**mg/L**	1	09-Aug-2021 19:28
Nickel	**0.00236**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Aug-2021 19:28
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Aug-2021 19:28
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	05-Aug-2021 12:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastructure, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071405
Sample ID: 16SW01-210726-FD Lab ID:HS21071405-10
Collection Date: 26-Jul-2021 13:00 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	03-Aug-2021 19:52
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 19:52
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 19:52
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 19:52
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	03-Aug-2021 19:52
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 19:52
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 19:52
Surr: 1,2-Dichloroethane-d4	*90.7*			**0**	*81-118*	*%REC*	*1*	*03-Aug-2021 19:52*
Surr: 4-Bromofluorobenzene	*97.5*			**0**	*85-114*	*%REC*	*1*	*03-Aug-2021 19:52*
Surr: Dibromofluoromethane	*92.4*			**0**	*80-119*	*%REC*	*1*	*03-Aug-2021 19:52*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*03-Aug-2021 19:52*
METALS BY ICPMS BY SW6020A		**Method:SW6020A**				Prep:SW3010A / 09-Aug-2021		Analyst: JHD
Arsenic	**0.00142**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	09-Aug-2021 19:30
Chromium	**0.000898**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	09-Aug-2021 19:30
Manganese	**0.335**		**0.000700**	**0.00250**	**0.00500**	**mg/L**	1	09-Aug-2021 19:30
Nickel	**0.00242**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Aug-2021 19:30
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Aug-2021 19:30
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	05-Aug-2021 12:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastructure, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071405
Sample ID: 16SW02-210726 Lab ID:HS21071405-11
Collection Date: 26-Jul-2021 13:20 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	04-Aug-2021 13:33
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Aug-2021 13:33
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	04-Aug-2021 13:33
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Aug-2021 13:33
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	04-Aug-2021 13:33
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Aug-2021 13:33
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	04-Aug-2021 13:33
Surr: 1,2-Dichloroethane-d4	*87.8*			**0**	*81-118*	*%REC*	*1*	*04-Aug-2021 13:33*
Surr: 4-Bromofluorobenzene	*99.7*			**0**	*85-114*	*%REC*	*1*	*04-Aug-2021 13:33*
Surr: Dibromofluoromethane	*90.5*			**0**	*80-119*	*%REC*	*1*	*04-Aug-2021 13:33*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*04-Aug-2021 13:33*
METALS BY ICPMS BY SW6020A		**Method:SW6020A**				Prep:SW3010A / 09-Aug-2021		Analyst: JHD
Arsenic	**0.00180**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	09-Aug-2021 19:15
Chromium	**0.00196**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	09-Aug-2021 19:15
Manganese	**0.742**		**0.000700**	**0.00250**	**0.00500**	**mg/L**	1	09-Aug-2021 19:15
Nickel	**0.00373**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Aug-2021 19:15
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Aug-2021 19:15
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	05-Aug-2021 12:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastructure, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071405
Sample ID: 16SW03-210726 Lab ID:HS21071405-12
Collection Date: 26-Jul-2021 13:50 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	03-Aug-2021 20:14
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 20:14
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 20:14
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 20:14
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	03-Aug-2021 20:14
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 20:14
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 20:14
Surr: 1,2-Dichloroethane-d4	*91.1*			**0**	*81-118*	*%REC*	*1*	*03-Aug-2021 20:14*
Surr: 4-Bromofluorobenzene	*99.2*			**0**	*85-114*	*%REC*	*1*	*03-Aug-2021 20:14*
Surr: Dibromofluoromethane	*91.8*			**0**	*80-119*	*%REC*	*1*	*03-Aug-2021 20:14*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*03-Aug-2021 20:14*
METALS BY ICPMS BY SW6020A		**Method:SW6020A**				Prep:SW3010A / 09-Aug-2021		Analyst: JHD
Arsenic	**0.00149**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	09-Aug-2021 19:32
Chromium	**0.00243**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	09-Aug-2021 19:32
Manganese	**0.380**		**0.000700**	**0.00250**	**0.00500**	**mg/L**	1	09-Aug-2021 19:32
Nickel	**0.00309**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Aug-2021 19:32
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Aug-2021 19:32
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	05-Aug-2021 12:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071405
Sample ID: Trip Blank-210726 Lab ID:HS21071405-13
Collection Date: 26-Jul-2021 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	03-Aug-2021 18:28
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 18:28
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 18:28
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 18:28
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	03-Aug-2021 18:28
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 18:28
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	03-Aug-2021 18:28
Surr: 1,2-Dichloroethane-d4	*92.8*			**0**	*81-118*	*%REC*	*1*	*03-Aug-2021 18:28*
Surr: 4-Bromofluorobenzene	*93.8*			**0**	*85-114*	*%REC*	*1*	*03-Aug-2021 18:28*
Surr: Dibromofluoromethane	*93.0*			**0**	*80-119*	*%REC*	*1*	*03-Aug-2021 18:28*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*03-Aug-2021 18:28*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 10-Aug-21

Weight / Prep Log

Client: Aptim Environmental & Infrastucture, Inc.

Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021

WorkOrder: HS21071405

Batch ID: 168892 **Start Date:** 09 Aug 2021 09:30 **End Date:** 09 Aug 2021 13:30

Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS21071405-09		10 (mL)	10 (mL)	1	120 plastic HNO3
HS21071405-10		10 (mL)	10 (mL)	1	120 plastic HNO3
HS21071405-11		10 (mL)	10 (mL)	1	120 plastic HNO3
HS21071405-12		10 (mL)	10 (mL)	1	120 plastic HNO3

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071405

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 168892 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** GW	
HS21071405-09	16SW01-210726	26 Jul 2021 13:00		09 Aug 2021 13:30	09 Aug 2021 19:28	1
HS21071405-10	16SW01-210726-FD	26 Jul 2021 13:00		09 Aug 2021 13:30	09 Aug 2021 19:30	1
HS21071405-11	16SW02-210726	26 Jul 2021 13:20		09 Aug 2021 13:30	09 Aug 2021 19:15	1
HS21071405-12	16SW03-210726	26 Jul 2021 13:50		09 Aug 2021 13:30	09 Aug 2021 19:32	1
Batch ID: R388610 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** GW	
HS21071405-08	16WW42-210726	26 Jul 2021 12:40			30 Jul 2021 15:33	1
Batch ID: R388821 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21071405-13	Trip Blank-210726	26 Jul 2021 00:00			03 Aug 2021 18:28	1
Batch ID: R388821 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** GW	
HS21071405-01	16EW02-210726	26 Jul 2021 07:35			03 Aug 2021 21:17	250
HS21071405-01	16EW02-210726	26 Jul 2021 07:35			03 Aug 2021 20:56	25
HS21071405-03	16EW08-210726	26 Jul 2021 09:05			03 Aug 2021 18:49	1
HS21071405-06	16RW02-210726	26 Jul 2021 11:15			03 Aug 2021 19:10	1
HS21071405-08	16WW42-210726	26 Jul 2021 12:40			03 Aug 2021 20:35	1
HS21071405-09	16SW01-210726	26 Jul 2021 13:00			03 Aug 2021 19:31	1
HS21071405-10	16SW01-210726-FD	26 Jul 2021 13:00			03 Aug 2021 19:52	1
HS21071405-12	16SW03-210726	26 Jul 2021 13:50			03 Aug 2021 20:14	1
Batch ID: R388888 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** GW	
HS21071405-02	16EW04-210726	26 Jul 2021 08:20			04 Aug 2021 19:09	25
HS21071405-02	16EW04-210726	26 Jul 2021 08:20			04 Aug 2021 18:48	5
HS21071405-04	16RW04-210726	26 Jul 2021 09:50			04 Aug 2021 15:18	25
HS21071405-04	16RW04-210726	26 Jul 2021 09:50			04 Aug 2021 14:15	1
HS21071405-05	16RW01-210726	26 Jul 2021 10:30			04 Aug 2021 20:34	50
HS21071405-05	16RW01-210726	26 Jul 2021 10:30			04 Aug 2021 20:12	5
HS21071405-07	16WW13-210726	26 Jul 2021 12:00			04 Aug 2021 19:51	25
HS21071405-07	16WW13-210726	26 Jul 2021 12:00			04 Aug 2021 19:30	5
HS21071405-11	16SW02-210726	26 Jul 2021 13:20			04 Aug 2021 13:33	1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071405

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R388904 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** GW	
HS21071405-01	16EW02-210726	26 Jul 2021 07:35			05 Aug 2021 12:56	1
HS21071405-02	16EW04-210726	26 Jul 2021 08:20			05 Aug 2021 12:56	1
HS21071405-03	16EW08-210726	26 Jul 2021 09:05			05 Aug 2021 12:56	1
HS21071405-04	16RW04-210726	26 Jul 2021 09:50			05 Aug 2021 12:56	1
HS21071405-05	16RW01-210726	26 Jul 2021 10:30			05 Aug 2021 12:56	1
HS21071405-06	16RW02-210726	26 Jul 2021 11:15			05 Aug 2021 12:56	1
HS21071405-07	16WW13-210726	26 Jul 2021 12:00			05 Aug 2021 12:56	1
HS21071405-08	16WW42-210726	26 Jul 2021 12:40			05 Aug 2021 12:56	1
HS21071405-09	16SW01-210726	26 Jul 2021 13:00			05 Aug 2021 12:56	1
HS21071405-10	16SW01-210726-FD	26 Jul 2021 13:00			05 Aug 2021 12:56	1
HS21071405-11	16SW02-210726	26 Jul 2021 13:20			05 Aug 2021 12:56	1
HS21071405-12	16SW03-210726	26 Jul 2021 13:50			05 Aug 2021 12:56	1
Batch ID: R389176 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B-2011				**Matrix:** GW	
HS21071405-08	16WW42-210726	26 Jul 2021 12:40			10 Aug 2021 12:23	1

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071405

QC BATCH REPORT

Batch ID: R388610 (0) **Instrument: FID-4** **Method: DISSOLVED GASES BY RSK-175**

MBLK Sample ID: **MBLK-210730** Units: **mg/L** Analysis Date: **30-Jul-2021 09:55**
Client ID: Run ID: **FID-4_388610** SeqNo: **6208821** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000250	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000250	0.000500								U

LCS Sample ID: **LCS-210730** Units: **mg/L** Analysis Date: **30-Jul-2021 10:05**
Client ID: Run ID: **FID-4_388610** SeqNo: **6208822** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0203	0.00100	0.01804	0	113	75 - 125				
Ethene	0.0175	0.00100	0.0168	0	104	75 - 125				
Methane	0.00983	0.000500	0.009647	0	102	75 - 125				

MS Sample ID: **HS21071204-02MS** Units: **mg/L** Analysis Date: **30-Jul-2021 14:47**
Client ID: Run ID: **FID-4_388610** SeqNo: **6208843** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.00961	0.00100	0.01804	0	53.3	75 - 125				S
Ethene	0.0105	0.00100	0.0168	0.002684	46.3	75 - 125				S
Methane	0.205	0.000500	0.009647	0.2549	-517	75 - 125				SEO

MS Sample ID: **HS21071038-02MS** Units: **mg/L** Analysis Date: **30-Jul-2021 10:52**
Client ID: Run ID: **FID-4_388610** SeqNo: **6208826** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0166	0.00100	0.01804	0	92.2	75 - 125				
Ethene	0.0160	0.00100	0.0168	0.0007136	91.0	75 - 125				
Methane	0.00757	0.000500	0.009647	0.001677	61.0	75 - 125				S

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071405

QC BATCH REPORT

Batch ID: R388610 (0) **Instrument: FID-4** **Method: DISSOLVED GASES BY RSK-175**

MSD Sample ID: **HS21071204-02MSD** Units: **mg/L** Analysis Date: **30-Jul-2021 14:56**
Client ID: Run ID: **FID-4_388610** SeqNo: **6208844** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.00943	0.00100	0.01804	0	52.3	75 - 125	0.009611	1.88	30	S
Ethene	0.0108	0.00100	0.0168	0.002684	48.1	75 - 125	0.01047	2.83	30	S
Methane	0.206	0.000500	0.009647	0.2549	-506	75 - 125	0.2051	0.523	30	SEO

MSD Sample ID: **HS21071038-02MSD** Units: **mg/L** Analysis Date: **30-Jul-2021 11:04**
Client ID: Run ID: **FID-4_388610** SeqNo: **6208827** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0166	0.00100	0.01804	0	91.8	75 - 125	0.01663	0.377	30	
Ethene	0.0161	0.00100	0.0168	0.0007136	91.8	75 - 125	0.01601	0.754	30	
Methane	0.00681	0.000500	0.009647	0.001677	53.2	75 - 125	0.007566	10.6	30	S

The following samples were analyzed in this batch: HS21071405-08

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071405

QC BATCH REPORT

Batch ID: 168892 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-168892** Units: **mg/L** Analysis Date: **09-Aug-2021 19:11**
Client ID: Run ID: **ICPMS06_389122** SeqNo: **6220762** PrepDate: **09-Aug-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.00100	0.00500								U
Chromium	0.00100	0.00500								U
Manganese	0.00250	0.00500								U
Nickel	0.00100	0.00500								U
Thallium	0.000500	0.00200								U

LCS Sample ID: **LCS-168892** Units: **mg/L** Analysis Date: **09-Aug-2021 19:13**
Client ID: Run ID: **ICPMS06_389122** SeqNo: **6220763** PrepDate: **09-Aug-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05092	0.00500	0.05	0	102	84 - 116				
Chromium	0.04928	0.00500	0.05	0	98.6	85 - 116				
Manganese	0.0497	0.00500	0.05	0	99.4	87 - 115				
Nickel	0.0496	0.00500	0.05	0	99.2	85 - 117				
Thallium	0.05362	0.00200	0.05	0	107	82 - 116				

MS Sample ID: **HS21071405-11MS** Units: **mg/L** Analysis Date: **09-Aug-2021 19:19**
Client ID: **16SW02-210726** Run ID: **ICPMS06_389122** SeqNo: **6220766** PrepDate: **09-Aug-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05307	0.00500	0.05	0.001797	103	84 - 116				
Chromium	0.05053	0.00500	0.05	0.001964	97.1	85 - 116				
Manganese	0.7677	0.00500	0.05	0.7422	51.0	87 - 115				SO
Nickel	0.05293	0.00500	0.05	0.00373	98.4	85 - 117				
Thallium	0.05401	0.00200	0.05	0.000087	108	82 - 116				

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071405

QC BATCH REPORT

Batch ID: 168892 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS21071405-11MSD** Units: **mg/L** Analysis Date: **09-Aug-2021 19:21**
Client ID: **16SW02-210726** Run ID: **ICPMS06_389122** SeqNo: **6220767** PrepDate: **09-Aug-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05298	0.00500	0.05	0.001797	102	84 - 116	0.05307	0.181	20	
Chromium	0.05035	0.00500	0.05	0.001964	96.8	85 - 116	0.05053	0.349	20	
Manganese	0.7509	0.00500	0.05	0.7422	17.4	87 - 115	0.7677	2.21	20	SO
Nickel	0.05238	0.00500	0.05	0.00373	97.3	85 - 117	0.05293	1.03	20	
Thallium	0.05369	0.00200	0.05	0.000087	107	82 - 116	0.05401	0.607	20	

PDS Sample ID: **HS21071405-11PDS** Units: **mg/L** Analysis Date: **09-Aug-2021 19:23**
Client ID: **16SW02-210726** Run ID: **ICPMS06_389122** SeqNo: **6220768** PrepDate: **09-Aug-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Manganese	0.7977	0.00500	0.1	0.7422	55.5	80 - 120				SO

SD Sample ID: **HS21071405-11SD** Units: **mg/L** Analysis Date: **09-Aug-2021 19:17**
Client ID: **16SW02-210726** Run ID: **ICPMS06_389122** SeqNo: **6220765** PrepDate: **09-Aug-2021** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	0.004007	0.0250					0.001797	0	10	J
Chromium	0.003762	0.0250					0.001964	0	10	J
Manganese	0.8073	0.0250					0.7422	8.77	10	
Nickel	0.005607	0.0250					0.00373	0	10	J
Thallium	0.002066	0.0100					0.000087	0	10	J

The following samples were analyzed in this batch: HS21071405-09 HS21071405-10 HS21071405-11 HS21071405-12

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071405

QC BATCH REPORT

Batch ID: R388821 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210803** Units: **ug/L** Analysis Date: **03-Aug-2021 13:13**
Client ID: Run ID: **VOA6_388821** SeqNo: **6213698** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.87*	*1.0*	*50*	*0*	*89.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.36*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*45.8*	*1.0*	*50*	*0*	*91.6*	*80 - 119*				
Surr: Toluene-d8	*51.62*	*1.0*	*50*	*0*	*103*	*89 - 112*				

LCS Sample ID: **VLCSW-210803** Units: **ug/L** Analysis Date: **03-Aug-2021 12:09**
Client ID: Run ID: **VOA6_388821** SeqNo: **6213697** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.59	1.0	20	0	98.0	80 - 119				
1,1-Dichloroethene	16.91	1.0	20	0	84.6	71 - 131				
1,2-Dichloroethane	19.08	1.0	20	0	95.4	73 - 128				
cis-1,2-Dichloroethene	18.06	1.0	20	0	90.3	78 - 123				
Methylene chloride	19.21	2.0	20	0	96.0	74 - 124				
Trichloroethene	19.42	1.0	20	0	97.1	79 - 123				
Vinyl chloride	17.1	1.0	20	0	85.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.43*	*1.0*	*50*	*0*	*96.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.29*	*1.0*	*50*	*0*	*98.6*	*85 - 114*				
Surr: Dibromofluoromethane	*47.57*	*1.0*	*50*	*0*	*95.1*	*80 - 119*				
Surr: Toluene-d8	*46.87*	*1.0*	*50*	*0*	*93.7*	*89 - 112*				

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071405

QC BATCH REPORT

Batch ID: R388821 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21071731-01MS** Units: **ug/L** Analysis Date: **03-Aug-2021 14:58**
Client ID: Run ID: **VOA6_388821** SeqNo: **6213703** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.57	1.0	20	0	87.8	80 - 119				
1,1-Dichloroethene	18.16	1.0	20	0	90.8	71 - 131				
1,2-Dichloroethane	17.5	1.0	20	0	87.5	73 - 128				
cis-1,2-Dichloroethene	39.67	1.0	20	20.07	98.0	78 - 123				
Methylene chloride	17.12	2.0	20	0	85.6	74 - 124				
Trichloroethene	117.6	1.0	20	105.6	60.1	79 - 123				SO
Vinyl chloride	80.97	1.0	20	63.6	86.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.05*	*1.0*	*50*	*0*	*90.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.19*	*1.0*	*50*	*0*	*98.4*	*85 - 114*				
Surr: Dibromofluoromethane	*45.9*	*1.0*	*50*	*0*	*91.8*	*80 - 119*				
Surr: Toluene-d8	*51.24*	*1.0*	*50*	*0*	*102*	*89 - 112*				

MSD Sample ID: **HS21071731-01MSD** Units: **ug/L** Analysis Date: **03-Aug-2021 15:19**
Client ID: Run ID: **VOA6_388821** SeqNo: **6213704** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.26	1.0	20	0	86.3	80 - 119	17.57	1.79	20	
1,1-Dichloroethene	16.14	1.0	20	0	80.7	71 - 131	18.16	11.8	20	
1,2-Dichloroethane	15.83	1.0	20	0	79.2	73 - 128	17.5	9.99	20	
cis-1,2-Dichloroethene	35.36	1.0	20	20.07	76.5	78 - 123	39.67	11.5	20	S
Methylene chloride	16.01	2.0	20	0	80.1	74 - 124	17.12	6.71	20	
Trichloroethene	108	1.0	20	105.6	12.1	79 - 123	117.6	8.53	20	SO
Vinyl chloride	74.74	1.0	20	63.6	55.7	58 - 137	80.97	8	20	S
Surr: 1,2-Dichloroethane-d4	*45.74*	*1.0*	*50*	*0*	*91.5*	*81 - 118*	*45.05*	*1.51*	*20*	
Surr: 4-Bromofluorobenzene	*50.19*	*1.0*	*50*	*0*	*100*	*85 - 114*	*49.19*	*2.03*	*20*	
Surr: Dibromofluoromethane	*45.96*	*1.0*	*50*	*0*	*91.9*	*80 - 119*	*45.9*	*0.132*	*20*	
Surr: Toluene-d8	*51.95*	*1.0*	*50*	*0*	*104*	*89 - 112*	*51.24*	*1.39*	*20*	

The following samples were analyzed in this batch:

HS21071405-01	HS21071405-03	HS21071405-06	HS21071405-08
HS21071405-09	HS21071405-10	HS21071405-12	HS21071405-13

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071405

QC BATCH REPORT

Batch ID: R388888 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210804** Units: **ug/L** Analysis Date: **04-Aug-2021 13:11**
Client ID: Run ID: **VOA6_388888** SeqNo: **6215041** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*43.87*	*1.0*	*50*	*0*	*87.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.49*	*1.0*	*50*	*0*	*97.0*	*85 - 114*				
Surr: Dibromofluoromethane	*45.13*	*1.0*	*50*	*0*	*90.3*	*80 - 119*				
Surr: Toluene-d8	*51.3*	*1.0*	*50*	*0*	*103*	*89 - 112*				

LCS Sample ID: **VLCSW-210804** Units: **ug/L** Analysis Date: **04-Aug-2021 12:08**
Client ID: Run ID: **VOA6_388888** SeqNo: **6215040** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.02	1.0	20	0	95.1	80 - 119				
1,1-Dichloroethene	15.94	1.0	20	0	79.7	71 - 131				
1,2-Dichloroethane	18.08	1.0	20	0	90.4	73 - 128				
cis-1,2-Dichloroethene	17.85	1.0	20	0	89.3	78 - 123				
Methylene chloride	18.55	2.0	20	0	92.8	74 - 124				
Trichloroethene	18.57	1.0	20	0	92.8	79 - 123				
Vinyl chloride	16.17	1.0	20	0	80.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.01*	*1.0*	*50*	*0*	*96.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.81*	*1.0*	*50*	*0*	*99.6*	*85 - 114*				
Surr: Dibromofluoromethane	*47.26*	*1.0*	*50*	*0*	*94.5*	*80 - 119*				
Surr: Toluene-d8	*47.6*	*1.0*	*50*	*0*	*95.2*	*89 - 112*				

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071405

QC BATCH REPORT

Batch ID: R388888 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21071405-11MS** Units: **ug/L** Analysis Date: **04-Aug-2021 14:36**
Client ID: **16SW02-210726** Run ID: **VOA6_388888** SeqNo: **6215044** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.33	1.0	20	0	96.6	80 - 119				
1,1-Dichloroethene	19	1.0	20	0	95.0	71 - 131				
1,2-Dichloroethane	18.42	1.0	20	0	92.1	73 - 128				
cis-1,2-Dichloroethene	18.58	1.0	20	0	92.9	78 - 123				
Methylene chloride	18.84	2.0	20	0	94.2	74 - 124				
Trichloroethene	23.69	1.0	20	0	118	79 - 123				
Vinyl chloride	19.84	1.0	20	0	99.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.94*	*1.0*	*50*	*0*	*97.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.14*	*1.0*	*50*	*0*	*100*	*85 - 114*				
Surr: Dibromofluoromethane	*47*	*1.0*	*50*	*0*	*94.0*	*80 - 119*				
Surr: Toluene-d8	*51.3*	*1.0*	*50*	*0*	*103*	*89 - 112*				

MSD Sample ID: **HS21071405-11MSD** Units: **ug/L** Analysis Date: **04-Aug-2021 14:57**
Client ID: **16SW02-210726** Run ID: **VOA6_388888** SeqNo: **6215045** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.67	1.0	20	0	98.3	80 - 119	19.33	1.73	20	
1,1-Dichloroethene	18.52	1.0	20	0	92.6	71 - 131	19	2.53	20	
1,2-Dichloroethane	18.53	1.0	20	0	92.7	73 - 128	18.42	0.613	20	
cis-1,2-Dichloroethene	17.68	1.0	20	0	88.4	78 - 123	18.58	4.97	20	
Methylene chloride	18.4	2.0	20	0	92.0	74 - 124	18.84	2.4	20	
Trichloroethene	20.38	1.0	20	0	102	79 - 123	23.69	15	20	
Vinyl chloride	17.86	1.0	20	0	89.3	58 - 137	19.84	10.5	20	
Surr: 1,2-Dichloroethane-d4	*47.82*	*1.0*	*50*	*0*	*95.6*	*81 - 118*	*48.94*	*2.33*	*20*	
Surr: 4-Bromofluorobenzene	*48.89*	*1.0*	*50*	*0*	*97.8*	*85 - 114*	*50.14*	*2.52*	*20*	
Surr: Dibromofluoromethane	*46.96*	*1.0*	*50*	*0*	*93.9*	*80 - 119*	*47*	*0.099*	*20*	
Surr: Toluene-d8	*51.28*	*1.0*	*50*	*0*	*103*	*89 - 112*	*51.3*	*0.0581*	*20*	

The following samples were analyzed in this batch: HS21071405-02 HS21071405-04 HS21071405-05 HS21071405-07 HS21071405-11

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071405

QC BATCH REPORT

Batch ID: R389176 (0) **Instrument:** TOC_04 **Method:** TOTAL ORGANIC CARBON - SM5310B-2011

MBLK Sample ID: **MBLK-080921** Units: **mg/L** Analysis Date: **10-Aug-2021 10:45**
Client ID: Run ID: **TOC_04_389176** SeqNo: **6221926** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **LCS-08092021** Units: **mg/L** Analysis Date: **10-Aug-2021 10:57**
Client ID: Run ID: **TOC_04_389176** SeqNo: **6221927** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.12	1.00	10	0	101	85 - 115				

LCSD Sample ID: **LCSD-08092021** Units: **mg/L** Analysis Date: **10-Aug-2021 11:09**
Client ID: Run ID: **TOC_04_389176** SeqNo: **6221928** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.721	1.00	10	0	97.2	85 - 115	10.12	4.02	20	

MS Sample ID: **HS21071405-08MS** Units: **mg/L** Analysis Date: **10-Aug-2021 12:38**
Client ID: **16WW42-210726** Run ID: **TOC_04_389176** SeqNo: **6221934** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	16.98	1.00	10	5.518	115	80 - 120				

The following samples were analyzed in this batch: HS21071405-08

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: **HS21071405**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

ALS Houston, US Date: 10-Aug-21

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	21-022-0	26-Mar-2022
Dept of Defense	PJLA L20-507-R2	22-Dec-2021
Florida	E87611-33	30-Jun-2022
Illinois	2000322021-7	09-May-2022
Kansas	E-10352 2021-2022	31-Jul-2022
Kentucky	123043, 2021-2022	30-Apr-2022
Louisiana	03087, 2021-2022	30-Jun-2022
North Carolina	624-2021	31-Dec-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-21-27	30-Apr-2022

ALS Houston, US Date: 10-Aug-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21071405

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS21071405-01	16EW02-210726	Login	7/27/2021 3:47:17 PM	PJM	Sub
HS21071405-01	16EW02-210726	Login	7/27/2021 3:47:17 PM	PJM	VOA020
HS21071405-02	16EW04-210726	Login	7/27/2021 3:47:17 PM	PJM	Sub
HS21071405-02	16EW04-210726	Login	7/27/2021 3:47:17 PM	PJM	VOA020
HS21071405-03	16EW08-210726	Login	7/27/2021 3:47:17 PM	PJM	Sub
HS21071405-03	16EW08-210726	Login	7/27/2021 3:47:17 PM	PJM	VOA020
HS21071405-13	Trip Blank-210726	Login	7/27/2021 3:47:17 PM	PJM	VOA020

ALS Houston, US Date: 10-Aug-21

Sample Receipt Checklist

Work Order ID: HS21071405 **Date/Time Received:** **27-Jul-2021 09:15**

Client Name: CBI-Houston **Received by:** **Paresh M. Giga**

Completed By: */S/ Pablo Marinez* 27-Jul-2021 15:50 **Reviewed by:** */S/ Ragen Giga* 28-Jul-2021 18:27

eSignature Date/Time eSignature Date/Time

Matrices: **WATER** Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:CLIENT
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.3°C UC/C	IR 31
Cooler(s)/Kit(s):	45694	
Date/Time sample(s) sent to storage:	7/27/21 14:05	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Page 1 of 1

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 501032
Job: **LHAAP 16 July 2021**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D. / Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020	Remarks (Preservatives, etc.)	Lab I.D.#
16EW02-210726	WG	7/26/21/0735		4	X					X			
16EW04-210726	WG	7/26/21/0820		4	X					X			
16EW08-210726	WG	7/26/21/0905		4	X					X			
16RW04-210726	WG	7/26/21/0950		4	X					X			
16RW01-210726	WG	7/26/21/1030		4	X					X			
16RW02-210726	WG	7/26/21/1115		4	X					X			
16WW13-210726	WG	7/26/21/1200		4	X					X			
16WW42-210726	WG	7/26/21/1240		9	X	X	X			X			

HS21071405

Aptim Environmental & Infrastucture, Inc.

Longhorn Army Ammunition Plant LHAAP 16 July 20

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	7/26/21	1430		7/27/2021	0915						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks: 45GP4 DUE 1.3.5 #31 CL:SS

(Word) S:\Forms\Chain of Custody - BiWeekly

01155986

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

HS21071405

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant LHAAP 16 July 20

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 501032
Job: **LHAAP 16 July 2021**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16SW01-210726	W6	7/26/21/1300		5	X					X	X					
16SW01-210726-FD	W6	7/26/21/1300		5	X					X	X					
16SW02-210726	W	7/26/21/1320		5	X					X	X					
16SW02-210726-MS	W	7/26/21/1320		5	X					X	X					
16SW02-210726-MSD	W	7/26/21/1320		5	X					X	X					
16SW03-210726	W	7/26/21/1350		5	X					X	X					
TRIP BLANK-210726	W	7/26/21		2	X											

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	7/26/21	1430	X	7/27/2021	9:15						

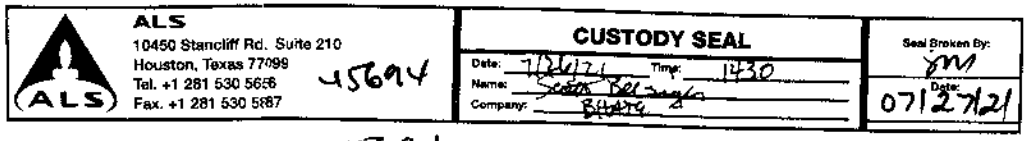
For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

01155987



ALS
10450 Stancliff Rd. Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

45694

CUSTODY SEAL

Date: 7/26/21 Time: 1430
Name: Scott Beesinger
Company: BHATS

Seal Broken By:
Date: 07/27/21

45694 JUL 27 2021

45694

ALS

ORIGIN ID:SGRA (903) 930-6183
SCOTT BEESINGER
APTIM ENVIRONMENTAL & INFRASTRUCTURE
1209-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 28JUN21
ACTWGT: 1.00 LB MAN
CAD: 0221247/CAFE3504
DIMS: 26x14x14 IN

TO SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON TX 77099
(281) 530-5856
REF: LHAAP-16-BO 79249-RG

RMA:

FedEx Express

FedEx
TRK# 0221 9473 0845 1302

TUE - 27 JUL 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

August 05, 2021 Service Request No:E2100837

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

Laboratory Results for: HS21071405

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory July 27, 2021
For your reference, these analyses have been assigned our service request number **E2100837.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

01155989

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100837
Project:	HS21071405	**Date Received:**	07/27/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Twelve samples were received for analysis at ALS Environmental in Houston on 07/27/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100470: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch. The LCS, DLCS, MS, & MSD recoveries are within QC limits.

DoD certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2100837
Project: HS21071405

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100837-001	16EW02-210726	7/26/2021	0735
E2100837-002	16EW04-210726	7/26/2021	0820
E2100837-003	16EW08-210726	7/26/2021	0905
E2100837-004	16RW04-210726	7/26/2021	0950
E2100837-005	16RW01-210726	7/26/2021	1030
E2100837-006	16RW02-210726	7/26/2021	1115
E2100837-007	16WW13-210726	7/26/2021	1200
E2100837-008	16WW42-210726	7/26/2021	1240
E2100837-009	16SW01-210726	7/26/2021	1300
E2100837-010	16SW01-210726-FD	7/26/2021	1300
E2100837-011	16SW02-210726	7/26/2021	1320
E2100837-012	16SW03-210726	7/26/2021	1350

Service Request Summary

Folder #: **E2100837**
Client Name: ALS Environmental - US
Project Name: HS21071405
Project Number:

Report To: Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 07/27/21
Internal Due Date: 8/10/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21071405
EDD: No EDD Specified

14 120 mL-Plastic Bottle Natural WM Unpreserved
Location: EHRMS-AirArch 1
Pressure Gas:
Rush

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100837-001	16EW02-210726	Ground Water	07/26/21 0735	**IV**
E2100837-002	16EW04-210726	Ground Water	07/26/21 0820	**IV**
E2100837-003	16EW08-210726	Ground Water	07/26/21 0905	**IV**
E2100837-004	16RW04-210726	Ground Water	07/26/21 0950	**IV**
E2100837-005	16RW01-210726	Ground Water	07/26/21 1030	**IV**
E2100837-006	16RW02-210726	Ground Water	07/26/21 1115	**IV**
E2100837-007	16WW13-210726	Ground Water	07/26/21 1200	**IV**
E2100837-008	16WW42-210726	Ground Water	07/26/21 1240	**IV**
E2100837-009	16SW01-210726	Ground Water	07/26/21 1300	**IV**
E2100837-010	16SW01-210726-FD	Ground Water	07/26/21 1300	**IV**
E2100837-011	16SW02-210726	Ground Water	07/26/21 1320	**IV**
E2100837-012	16SW03-210726	Ground Water	07/26/21 1350	**IV**

Service Request Summary

Folder #: **E2100837**
Client Name: ALS Environmental - US
Project Name: HS21071405
Project Number:

Report To: Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 07/27/21
Internal Due Date: 8/10/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21071405
EDD: No EDD Specified

14 120 mL-Plastic Bottle Natural WM Unpreserved
Location: EHRMS-AirArch 1
Pressure Gas:
Rush

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	11	IV due 8/17
Semivoa GCMS	ClO4 DOD/6850	1	MS/MSD

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

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ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arkansas Department of Environmental Quality	21-022-0	3/26/2022
Arkansas Department of Environmental Quality	19-028-0	6/30/2022
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-33	6/30/2022
Hawaii Department of Health	2021-2022	4/30/2022
Kansas Department of Health and Environment	E-10352 2022	7/31/2022
Louisiana Department of Environmental Quality	03087-2021	6/30/2022
Louisiana Department of Health and Hospitals	LA028-2021	12/31/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Minnesota Department of Health	2021671	12/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209421	4/24/2022
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	68-03441-015	6/30/2022
Tennessee Department of Environment and Concervation	04016-2021	4/30/2022
Texas Commision on Environmental Quality	T104704231-21-27	4/30/2022
United States Department of Agriculture	P330-19-00299	10/10/2022

01155998

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **16566**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	Ragen Giga
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RagenP.Giga@ALSGlobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS21071405
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21071405-01**	**16EW02-210726**	**GW**	**26 Jul 2021 07:35**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			10 Aug 2021
2.	**HS21071405-02**	**16EW04-210726**	**GW**	**26 Jul 2021 08:20**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			10 Aug 2021
3.	**HS21071405-03**	**16EW08-210726**	**GW**	**26 Jul 2021 09:05**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			10 Aug 2021
4.	**HS21071405-04**	**16RW04-210726**	**GW**	**26 Jul 2021 09:50**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			10 Aug 2021
5.	**HS21071405-05**	**16RW01-210726**	**GW**	**26 Jul 2021 10:30**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			10 Aug 2021
6.	**HS21071405-06**	**16RW02-210726**	**GW**	**26 Jul 2021 11:15**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			10 Aug 2021
7.	**HS21071405-07**	**16WW13-210726**	**GW**	**26 Jul 2021 12:00**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			10 Aug 2021
8.	**HS21071405-08**	**16WW42-210726**	**GW**	**26 Jul 2021 12:40**

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 16566**

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			10 Aug 2021
9.	**HS21071405-09**	**16SW01-210726**	**GW**	**26 Jul 2021 13:00**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			10 Aug 2021
10.	**HS21071405-10**	**16SW01-210726-FD**	**GW**	**26 Jul 2021 13:00**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			10 Aug 2021
11.	**HS21071405-11**	**16SW02-210726**	**GW**	**26 Jul 2021 13:20**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			10 Aug 2021
12.	**HS21071405-12**	**16SW03-210726**	**GW**	**26 Jul 2021 13:50**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			10 Aug 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: Paul M Date/Time: 7-27-21 16:07

Received By: Corey G Date/Time: 7/27/21 16:07

Cooler ID(s): Temperature(s):

01156001

ALS Environmental

Cooler Receipt Form

Project Chemist CG

Client/Project ALS-H

Thermometer ID 1831

Date/Time Received: 7/27/21 Initials: CG

Date/Time Logged in: 7/27/21 Initials CG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ ALS Courier ○ Client

2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ✓ No

Were they intact? ○ Yes ○ No ✓ N/A

Were they signed and dated? ○ Yes ○ No ✓ N/A

If yes, how many and where?

4. Packing Material: ○ Inserts ✓ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		7/27/21	1607	CG	5.0	☑
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No

7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No

8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No

9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No

10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

01156003

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 384286 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** **Prep Date/Time:** 7/30/21 10:05

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100831-001	OBFOD-2R	.01	6850/ClO4 DOD			Water	10mL	
2	E2100831-002	OBFOD-3	.01	6850/ClO4 DOD			Water	10mL	
3	E2100836-001	LH18/24-SP650_072721_BIX	.01	6850/ClO4 DOD			Water	10mL	
4	E2100837-001	16EW02-210726	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100837-002	16EW04-210726	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100837-003	16EW08-210726	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100837-004	16RW04-210726	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2100837-005	16RW01-210726	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2100837-006	16RW02-210726	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2100837-007	16WW13-210726	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2100837-008	16WW42-210726	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2100837-009	16SW01-210726	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2100837-010	16SW01-210726-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2100837-011	16SW02-210726	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2100837-012	16SW03-210726	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2100856-001	16WW12-210728	.01	6850/ClO4 DOD			Ground Water	10mL	
17	E2100856-002	16WW39-210728	.01	6850/ClO4 DOD			Ground Water	10mL	
18	E2100856-003	16WW49-210728	.01	6850/ClO4 DOD			Ground Water	10mL	
19	E2100856-004	16WW27-210728	.01	6850/ClO4 DOD			Ground Water	10mL	
20	E2100856-005	16WW43-210728	.01	6850/ClO4 DOD			Ground Water	10mL	
21	EQ2100470-01	MB		6850/ClO4 DOD			Liquid	10mL	
22	EQ2100470-02	LCS		6850/ClO4 DOD			Liquid	10mL	
23	EQ2100470-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
24	EQ2100470-04	16SW02-210726 MS	.01	6850/ClO4 DOD			Liquid	10mL	
25	EQ2100470-05	16SW02-210726 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 214765 Logbook Ref: Sodium Perchlorate Expires On: 12/11/2022

E2100831-001	100.00µL	E2100831-002	100.00µL	E2100836-001	100.00µL	E2100837-001	100.00µL	E2100837-002	100.00µL	E2100837-003	100.00µL
E2100837-004	100.00µL	E2100837-005	100.00µL	E2100837-006	100.00µL	E2100837-007	100.00µL	E2100837-008	100.00µL	E2100837-009	100.00µL
E2100837-010	100.00µL	E2100837-011	100.00µL	E2100837-012	100.00µL	E2100856-001	100.00µL	E2100856-002	100.00µL	E2100856-003	100.00µL
E2100856-004	100.00µL	E2100856-005	100.00µL	EQ2100470-01	100.00µL	EQ2100470-02	100.00µL	EQ2100470-03	100.00µL	EQ2100470-04	100.00µL
EQ2100470-05	100.00µL										

Preparation Information Benchsheet

Prep Run#: 384286 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** **Prep Date/Time:** 7/30/21 10:05

Name:	Perchlorate Intermediate Stock1	Inventory ID	217422	Logbook Ref:	Perchlorate	Expires On:	11/26/2021

EQ2100470-02 1.00µL EQ2100470-03 1.00µL EQ2100470-04 1.00µL EQ2100470-05 1.00µL

Preparation Materials

Water HPLC Grade 07/01/2021 Water (217918) 537M Glass Culture Tubes 537M Glass Tubes (218064)

Preparation Steps

Step: Preparation
Started: 7/30/21 10:05
Finished: 7/30/21 11:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 7/30/21

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined

Received By: _____ Date: _____ Yes No

01156006

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100837
Project:	HS21071405	**Date Collected:**	7/26/21 0735
Sample Matrix:	Ground Water	**Date Received:**	7/27/21
Sample Name:	16EW02-210726	**Units:**	µg/L
Lab Code:	E2100837-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.984**	J	1.00	0.500	0.250	10	7/30/21	8/4/21 20:18	384286	733747	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100837
Project:	HS21071405	**Date Collected:**	7/26/21 0820
Sample Matrix:	Ground Water	**Date Received:**	7/27/21
Sample Name:	16EW04-210726	**Units:**	µg/L
Lab Code:	E2100837-002	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	7/30/21	8/4/21 20:26	384286	733747	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100837
Project:	HS21071405	**Date Collected:**	7/26/21 0905
Sample Matrix:	Ground Water	**Date Received:**	7/27/21
Sample Name:	16EW08-210726	**Units:**	µg/L
Lab Code:	E2100837-003	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	7/30/21	8/3/21 00:32	384286	733464	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100837
Project:	HS21071405	**Date Collected:**	7/26/21 0950
Sample Matrix:	Ground Water	**Date Received:**	7/27/21
Sample Name:	16RW04-210726	**Units:**	µg/L
Lab Code:	E2100837-004	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	7/30/21	8/4/21 20:35	384286	733747	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100837
Project:	HS21071405	**Date Collected:**	7/26/21 1030
Sample Matrix:	Ground Water	**Date Received:**	7/27/21
Sample Name:	16RW01-210726	**Units:**	µg/L
Lab Code:	E2100837-005	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	7/30/21	8/4/21 20:43	384286	733747	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100837
Project:	HS21071405	**Date Collected:**	7/26/21 1115
Sample Matrix:	Ground Water	**Date Received:**	7/27/21
Sample Name:	16RW02-210726	**Units:**	µg/L
Lab Code:	E2100837-006	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0255**	J	0.100	0.0500	0.0250	1	7/30/21	8/3/21 00:58	384286	733464	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100837
Project:	HS21071405	**Date Collected:**	7/26/21 1200
Sample Matrix:	Ground Water	**Date Received:**	7/27/21
Sample Name:	16WW13-210726	**Units:**	µg/L
Lab Code:	E2100837-007	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	7/30/21	8/4/21 20:52	384286	733747	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100837
Project:	HS21071405	**Date Collected:**	7/26/21 1240
Sample Matrix:	Ground Water	**Date Received:**	7/27/21
Sample Name:	16WW42-210726	**Units:**	µg/L
Lab Code:	E2100837-008	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	7/30/21	8/3/21 01:15	384286	733464	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100837
Project:	HS21071405	**Date Collected:**	7/26/21 1300
Sample Matrix:	Ground Water	**Date Received:**	7/27/21
Sample Name:	16SW01-210726	**Units:**	µg/L
Lab Code:	E2100837-009	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	7/30/21	8/3/21 01:23	384286	733464	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100837
Project:	HS21071405	**Date Collected:**	7/26/21 1300
Sample Matrix:	Ground Water	**Date Received:**	7/27/21
Sample Name:	16SW01-210726-FD	**Units:**	µg/L
Lab Code:	E2100837-010	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	7/30/21	8/3/21 01:32	384286	733464	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100837
Project:	HS21071405	**Date Collected:**	7/26/21 1320
Sample Matrix:	Ground Water	**Date Received:**	7/27/21
Sample Name:	16SW02-210726	**Units:**	µg/L
Lab Code:	E2100837-011	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	7/30/21	8/3/21 01:40	384286	733464	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100837
Project:	HS21071405	**Date Collected:**	7/26/21 1350
Sample Matrix:	Ground Water	**Date Received:**	7/27/21
Sample Name:	16SW03-210726	**Units:**	µg/L
Lab Code:	E2100837-012	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	7/30/21	8/3/21 01:49	384286	733464	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100837
Project:	HS21071405	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100470-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	7/30/21	7/30/21 11:24	384286	733225	

01156020

Accuracy & Precision

ALS Environmental - Houston HRMS
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ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21071405
Sample Matrix: Ground Water

Service Request: E2100837
Date Analyzed: 7/30/21

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Units: µg/L
Basis: NA

Extraction Lot: 384286

	Lab Control Sample EQ2100470-02			Duplicate Lab Control Sample EQ2100470-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0870	0.100	87	0.0884	0.100	88	84 - 119	2	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100837
Project:	HS21071405	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100470-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0870**	J	0.100	0.0500	0.0250	1	7/30/21	7/30/21 11:32	384286	733225	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100837
Project:	HS21071405	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100470-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0884**	J	0.100	0.0500	0.0250	1	7/30/21	7/30/21 12:00	384286	733225	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100837
Project:	HS21071405	**Date Collected:**	7/26/21
Sample Matrix:	Ground Water	**Date Received:**	7/27/21
		Date Analyzed:	7/30/21

Matrix Spike Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	16SW02-210726	**Units:**	µg/L
Lab Code:	E2100837-011	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		16SW02-210726MS				16SW02-210726DMS					
		Matrix Spike				**Duplicate Matrix Spike**					
		EQ2100470-04				EQ2100470-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**		**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	ND	0.0892	0.100	89		0.0946	0.100	95	84 - 119	6	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100837
Project:	HS21071405	**Date Collected:**	7/26/21 1320
Sample Matrix:	Ground Water	**Date Received:**	7/27/21
Sample Name:	16SW02-210726	**Units:**	µg/L
Lab Code:	EQ2100470-04	**Basis:**	NA
Run Type:	Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0892**	J	0.100	0.0500	0.0250	1	7/30/21	7/30/21 12:09	384286	733225	*

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100837
Project:	HS21071405	**Date Collected:**	7/26/21 1320
Sample Matrix:	Ground Water	**Date Received:**	7/27/21
Sample Name:	16SW02-210726	**Units:**	µg/L
Lab Code:	EQ2100470-05	**Basis:**	NA
Run Type:	Duplicate Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0946**	J	0.100	0.0500	0.0250	1	7/30/21	7/30/21 12:17	384286	733225	*

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September 09, 2021

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
10333 Richmond Ave
Ste 1030
Houston, TX 77042

Work Order: **HS21071465**

Laboratory Results for: **Longhorn Army Ammunition Plant LHAAP 16 July 2021**

Dear Vicki Graves ,

ALS Environmental received 9 sample(s) on Jul 28, 2021 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,



Generated By: JUMOKE.LAWAL
Ragen Giga
Project Manager

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21071465

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21071465-01	16RW10-210727	GW		27-Jul-2021 07:15	28-Jul-2021 09:20	☐
HS21071465-02	16RW09-210727	GW		27-Jul-2021 08:00	28-Jul-2021 09:20	☐
HS21071465-03	16RW07-210727	GW		27-Jul-2021 08:50	28-Jul-2021 09:20	☐
HS21071465-04	16RW06-210727	GW		27-Jul-2021 09:35	28-Jul-2021 09:20	☐
HS21071465-05	16WW46-210727	GW		27-Jul-2021 10:20	28-Jul-2021 09:20	☐
HS21071465-06	16WW40-210727	GW		27-Jul-2021 11:05	28-Jul-2021 09:20	☐
HS21071465-07	16EW07-210727	GW		27-Jul-2021 11:50	28-Jul-2021 09:20	☐
HS21071465-08	16EW06-210727	Oil		27-Jul-2021 12:35	28-Jul-2021 09:20	☐
HS21071465-09	Trip Blank-210727	Water	CG-051121-37	27-Jul-2021 00:00	28-Jul-2021 09:20	☐

Revision:1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21071465

Work Order Comments

- REV01: Report Revised on Sept 09 2021 to report LOD values for Volatile Organics Method SW8260 Soil) and Alkalinity on sample 16EW06-210727

The analysis for Perchlorate was subcontracted to ALS Houston Specialty Lab. Final report attached.

Work Order Comments

- Matrix for sample ID 16EW06-210727 (HS21071465-08) is listed as water matrix on the COC, the sample is an Oil matrix, not miscible in water. Therefore we will not be in a position to run TOC/RSK analysis, We can do Alkalinity as soil but keep in mind it is an oil sample so we will be analyzing the water portion after mixing the sample, We will adjust test codes to run analyses accordingly where applicable
- 16EW07-210727 & 16EW06-210727 - All Vials contain >6mm headspace

GC Semivolatiles by Method RSK-175

Batch ID: R388774

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R388997

Sample ID: 16EW06-210727 (HS21071465-08)

- Lowest practical dilution performed due to matrix. Sample is oil.

Batch ID: R388996

Sample ID: 16EW07-210727 (HS21071465-07)

- Lowest practical dilution performed due to matrix.

Batch ID: R389546

Sample ID: 16RW06-210727 (HS21071465-04)

- Sample extracted outside of the holding time due to laboratory error. Sample results should be considered estimated.

Sample ID: 16RW07-210727 (HS21071465-03)

- Sample extracted outside of the holding time due to laboratory error. Sample results should be considered estimated.

Sample ID: 16WW46-210727 (HS21071465-05)

- Sample extracted outside of the holding time due to laboratory error. Sample results should be considered estimated.

Sample ID: HS21080560-02MS

- MS and MSD are for an unrelated sample

Batch ID: R388888

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21071465

WetChemistry by Method SM5310B

Batch ID: R389291

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM2320B

Batch ID: 168934

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: 168561

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071465
Sample ID: 16RW10-210727 Lab ID:HS21071465-01
Collection Date: 27-Jul-2021 07:15 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	04-Aug-2021 21:37
1,1-Dichloroethene	**8.5**		**1.0**	**2.5**	**5.0**	**ug/L**	5	04-Aug-2021 21:37
1,2-Dichloroethane	**16**		**1.0**	**2.5**	**5.0**	**ug/L**	5	04-Aug-2021 21:37
cis-1,2-Dichloroethene	**670**		**1.0**	**2.5**	**5.0**	**ug/L**	5	04-Aug-2021 21:37
Methylene chloride	5.0	U	2.0	5.0	10	ug/L	5	04-Aug-2021 21:37
Trichloroethene	**2,000**		**5.0**	**12**	**25**	**ug/L**	25	05-Aug-2021 18:14
Vinyl chloride	**49**		**1.0**	**2.5**	**5.0**	**ug/L**	5	04-Aug-2021 21:37
Surr: 1,2-Dichloroethane-d4	*94.3*			**0**	*81-118*	*%REC*	*5*	*04-Aug-2021 21:37*
Surr: 1,2-Dichloroethane-d4	*89.2*			**0**	*81-118*	*%REC*	*25*	*05-Aug-2021 18:14*
Surr: 4-Bromofluorobenzene	*96.5*			**0**	*85-114*	*%REC*	*5*	*04-Aug-2021 21:37*
Surr: 4-Bromofluorobenzene	*98.9*			**0**	*85-114*	*%REC*	*25*	*05-Aug-2021 18:14*
Surr: Dibromofluoromethane	*94.9*			**0**	*80-119*	*%REC*	*5*	*04-Aug-2021 21:37*
Surr: Dibromofluoromethane	*90.1*			**0**	*80-119*	*%REC*	*25*	*05-Aug-2021 18:14*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*5*	*04-Aug-2021 21:37*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*25*	*05-Aug-2021 18:14*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	03-Aug-2021 10:19
Ethene	**0.0104**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	03-Aug-2021 10:19
Methane	**0.416**		**0.00268**	**0.00625**	**0.0125**	**mg/L**	25	03-Aug-2021 13:53
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**5.15**		**0.500**	**1.00**	**1.00**	**mg/L**	1	11-Aug-2021 12:59
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	18-Aug-2021 18:16

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071465
Sample ID: 16RW09-210727 Lab ID:HS21071465-02
Collection Date: 27-Jul-2021 08:00 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	05-Aug-2021 18:56
1,1-Dichloroethene	**9.6**		**1.0**	**2.5**	**5.0**	**ug/L**	5	05-Aug-2021 18:56
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	ug/L	5	05-Aug-2021 18:56
cis-1,2-Dichloroethene	**180**		**1.0**	**2.5**	**5.0**	**ug/L**	5	05-Aug-2021 18:56
Methylene chloride	5.0	U	2.0	5.0	10	ug/L	5	05-Aug-2021 18:56
Trichloroethene	**1,400**		**5.0**	**12**	**25**	**ug/L**	25	05-Aug-2021 19:17
Vinyl chloride	**59**		**1.0**	**2.5**	**5.0**	**ug/L**	5	05-Aug-2021 18:56
Surr: 1,2-Dichloroethane-d4	*89.2*			**0**	*81-118*	*%REC*	*5*	*05-Aug-2021 18:56*
Surr: 1,2-Dichloroethane-d4	*89.2*			**0**	*81-118*	*%REC*	*25*	*05-Aug-2021 19:17*
Surr: 4-Bromofluorobenzene	*98.0*			**0**	*85-114*	*%REC*	*5*	*05-Aug-2021 18:56*
Surr: 4-Bromofluorobenzene	*96.5*			**0**	*85-114*	*%REC*	*25*	*05-Aug-2021 19:17*
Surr: Dibromofluoromethane	*91.0*			**0**	*80-119*	*%REC*	*5*	*05-Aug-2021 18:56*
Surr: Dibromofluoromethane	*92.3*			**0**	*80-119*	*%REC*	*25*	*05-Aug-2021 19:17*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*5*	*05-Aug-2021 18:56*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*25*	*05-Aug-2021 19:17*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	03-Aug-2021 10:29
Ethene	**0.00125**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	03-Aug-2021 10:29
Methane	**0.255**		**0.00268**	**0.00625**	**0.0125**	**mg/L**	25	03-Aug-2021 14:13
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**2.52**		**0.500**	**1.00**	**1.00**	**mg/L**	1	11-Aug-2021 13:29
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	18-Aug-2021 18:16

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071465
Sample ID: 16RW07-210727 Lab ID:HS21071465-03
Collection Date: 27-Jul-2021 08:50 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	HU	0.30	1.0	1.0	ug/L	1	13-Aug-2021 14:15
1,1-Dichloroethene	**4.1**	H	**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Aug-2021 14:15
1,2-Dichloroethane	0.50	HU	0.20	0.50	1.0	ug/L	1	13-Aug-2021 14:15
cis-1,2-Dichloroethene	**35**	H	**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Aug-2021 14:15
Methylene chloride	1.0	HU	0.40	1.0	2.0	ug/L	1	13-Aug-2021 14:15
Trichloroethene	**760**	H	**2.0**	**5.0**	**10**	**ug/L**	10	13-Aug-2021 15:39
Vinyl chloride	**15**	H	**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Aug-2021 14:15
Surr: 1,2-Dichloroethane-d4	*81.8*			**0**	*81-118*	*%REC*	*1*	*13-Aug-2021 14:15*
Surr: 1,2-Dichloroethane-d4	*81.8*			**0**	*81-118*	*%REC*	*10*	*13-Aug-2021 15:39*
Surr: 4-Bromofluorobenzene	*98.3*			**0**	*85-114*	*%REC*	*1*	*13-Aug-2021 14:15*
Surr: 4-Bromofluorobenzene	*97.5*			**0**	*85-114*	*%REC*	*10*	*13-Aug-2021 15:39*
Surr: Dibromofluoromethane	*83.5*			**0**	*80-119*	*%REC*	*1*	*13-Aug-2021 14:15*
Surr: Dibromofluoromethane	*84.3*			**0**	*80-119*	*%REC*	*10*	*13-Aug-2021 15:39*
Surr: Toluene-d8	*99.7*			**0**	*89-112*	*%REC*	*1*	*13-Aug-2021 14:15*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*10*	*13-Aug-2021 15:39*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	18-Aug-2021 18:16

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071465
Sample ID: 16RW06-210727 Lab ID:HS21071465-04
Collection Date: 27-Jul-2021 09:35 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	HU	0.30	1.0	1.0	ug/L	1	13-Aug-2021 13:54
1,1-Dichloroethene	0.50	HU	0.20	0.50	1.0	ug/L	1	13-Aug-2021 13:54
1,2-Dichloroethane	0.50	HU	0.20	0.50	1.0	ug/L	1	13-Aug-2021 13:54
cis-1,2-Dichloroethene	**4.4**	H	**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Aug-2021 13:54
Methylene chloride	1.0	HU	0.40	1.0	2.0	ug/L	1	13-Aug-2021 13:54
Trichloroethene	**64**	H	**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Aug-2021 13:54
Vinyl chloride	0.50	HU	0.20	0.50	1.0	ug/L	1	13-Aug-2021 13:54
Surr: 1,2-Dichloroethane-d4	*81.9*			**0**	*81-118*	*%REC*	*1*	*13-Aug-2021 13:54*
Surr: 4-Bromofluorobenzene	*97.0*			**0**	*85-114*	*%REC*	*1*	*13-Aug-2021 13:54*
Surr: Dibromofluoromethane	*83.2*			**0**	*80-119*	*%REC*	*1*	*13-Aug-2021 13:54*
Surr: Toluene-d8	*100.0*			**0**	*89-112*	*%REC*	*1*	*13-Aug-2021 13:54*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	18-Aug-2021 18:16

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071465
Sample ID: 16WW46-210727 Lab ID:HS21071465-05
Collection Date: 27-Jul-2021 10:20 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	HU	0.30	1.0	1.0	ug/L	1	13-Aug-2021 16:00
1,1-Dichloroethene	0.50	HU	0.20	0.50	1.0	ug/L	1	13-Aug-2021 16:00
1,2-Dichloroethane	0.50	HU	0.20	0.50	1.0	ug/L	1	13-Aug-2021 16:00
cis-1,2-Dichloroethene	0.50	HU	0.20	0.50	1.0	ug/L	1	13-Aug-2021 16:00
Methylene chloride	1.0	HU	0.40	1.0	2.0	ug/L	1	13-Aug-2021 16:00
Trichloroethene	**0.63**	JH	**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Aug-2021 16:00
Vinyl chloride	0.50	HU	0.20	0.50	1.0	ug/L	1	13-Aug-2021 16:00
Surr: 1,2-Dichloroethane-d4	*81.0*			**0**	*81-118*	*%REC*	*1*	*13-Aug-2021 16:00*
Surr: 4-Bromofluorobenzene	*96.7*			**0**	*85-114*	*%REC*	*1*	*13-Aug-2021 16:00*
Surr: Dibromofluoromethane	*83.8*			**0**	*80-119*	*%REC*	*1*	*13-Aug-2021 16:00*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*13-Aug-2021 16:00*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	18-Aug-2021 18:16

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071465
Sample ID: 16WW40-210727 Lab ID:HS21071465-06
Collection Date: 27-Jul-2021 11:05 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	04-Aug-2021 18:06
1,1-Dichloroethene	**7.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Aug-2021 18:06
1,2-Dichloroethane	**6.4**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Aug-2021 18:06
cis-1,2-Dichloroethene	**190**		**5.0**	**12**	**25**	**ug/L**	25	05-Aug-2021 18:35
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	04-Aug-2021 18:06
Trichloroethene	**1,900**		**5.0**	**12**	**25**	**ug/L**	25	05-Aug-2021 18:35
Vinyl chloride	**9.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Aug-2021 18:06
Surr: 1,2-Dichloroethane-d4	*96.7*			**0**	*81-118*	*%REC*	*1*	*04-Aug-2021 18:06*
Surr: 1,2-Dichloroethane-d4	*88.9*			**0**	*81-118*	*%REC*	*25*	*05-Aug-2021 18:35*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*04-Aug-2021 18:06*
Surr: 4-Bromofluorobenzene	*96.2*			**0**	*85-114*	*%REC*	*25*	*05-Aug-2021 18:35*
Surr: Dibromofluoromethane	*93.5*			**0**	*80-119*	*%REC*	*1*	*04-Aug-2021 18:06*
Surr: Dibromofluoromethane	*93.2*			**0**	*80-119*	*%REC*	*25*	*05-Aug-2021 18:35*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*04-Aug-2021 18:06*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*25*	*05-Aug-2021 18:35*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	**0.000953**	J	**0.000144**	**0.000250**	**0.00100**	**mg/L**	1	03-Aug-2021 10:40
Ethene	**0.00160**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	03-Aug-2021 10:40
Methane	**0.309**		**0.00268**	**0.00625**	**0.0125**	**mg/L**	25	03-Aug-2021 14:26
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**10.1**		**0.500**	**1.00**	**1.00**	**mg/L**	1	11-Aug-2021 13:44
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	18-Aug-2021 18:16

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071465
Sample ID: 16EW07-210727 Lab ID:HS21071465-07
Collection Date: 27-Jul-2021 11:50 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1,000	U	300	1000	1000	ug/L	1000	05-Aug-2021 16:29
1,1-Dichloroethene	500	U	200	500	1000	ug/L	1000	05-Aug-2021 16:29
1,2-Dichloroethane	500	U	200	500	1000	ug/L	1000	05-Aug-2021 16:29
cis-1,2-Dichloroethene	500	U	200	500	1000	ug/L	1000	05-Aug-2021 16:29
Methylene chloride	1,000	U	400	1000	2000	ug/L	1000	05-Aug-2021 16:29
Trichloroethene	500	U	200	500	1000	ug/L	1000	05-Aug-2021 16:29
Vinyl chloride	500	U	200	500	1000	ug/L	1000	05-Aug-2021 16:29
Surr: 1,2-Dichloroethane-d4	*89.7*			**0**	*81-118*	*%REC*	*1000*	*05-Aug-2021 16:29*
Surr: 4-Bromofluorobenzene	*93.9*			**0**	*85-114*	*%REC*	*1000*	*05-Aug-2021 16:29*
Surr: Dibromofluoromethane	*91.0*			**0**	*80-119*	*%REC*	*1000*	*05-Aug-2021 16:29*
Surr: Toluene-d8	*99.6*			**0**	*89-112*	*%REC*	*1000*	*05-Aug-2021 16:29*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	18-Aug-2021 18:16

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071465
Sample ID: 16EW06-210727 Lab ID:HS21071465-08
Collection Date: 27-Jul-2021 12:35 Matrix:Oil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY SW8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5,000	U	1200	5000	12000	ug/Kg	2500	05-Aug-2021 16:50
1,1-Dichloroethene	5,000	U	1200	5000	12000	ug/Kg	2500	05-Aug-2021 16:50
1,2-Dichloroethane	5,000	U	1500	5000	12000	ug/Kg	2500	05-Aug-2021 16:50
cis-1,2-Dichloroethene	5,000	U	2000	5000	12000	ug/Kg	2500	05-Aug-2021 16:50
Methylene chloride	5,000	U	2500	5000	25000	ug/Kg	2500	05-Aug-2021 16:50
Trichloroethene	5,000	U	1500	5000	12000	ug/Kg	2500	05-Aug-2021 16:50
Vinyl chloride	5,000	U	2000	5000	5000	ug/Kg	2500	05-Aug-2021 16:50
Surr: 1,2-Dichloroethane-d4	*89.5*			**0**	*71-136*	*%REC*	*2500*	*05-Aug-2021 16:50*
Surr: 4-Bromofluorobenzene	*100*			**0**	*79-119*	*%REC*	*2500*	*05-Aug-2021 16:50*
Surr: Dibromofluoromethane	*91.3*			**0**	*78-119*	*%REC*	*2500*	*05-Aug-2021 16:50*
Surr: Toluene-d8	*99.8*			**0**	*85-116*	*%REC*	*2500*	*05-Aug-2021 16:50*
ALKALINITY BY SM2320B MOD.		**Method:SM2320B**				Prep:ASTM Leachate / 10-Aug-2021		Analyst: TH
Alkalinity, Total (As CaCO3)	10.0	aU	10.0	10.0	10.0	mg/Kg	1	10-Aug-2021 22:20
ANIONS BY SW9056A		**Method:SW9056**				Prep:SW9056 / 28-Jul-2021		Analyst: YP
Bromide	0.991	U	0.297	0.991	0.991	mg/Kg	1	29-Jul-2021 06:55
Nitrogen, Nitrate (As N)	**0.619**	J	**0.297**	**0.991**	**0.991**	**mg/Kg**	1	29-Jul-2021 06:55
Sulfate	4.95	U	1.98	4.95	4.95	mg/Kg	1	29-Jul-2021 06:55
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	18-Aug-2021 18:16

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 WorkOrder:HS21071465
Sample ID: Trip Blank-210727 Lab ID:HS21071465-09
Collection Date: 27-Jul-2021 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	04-Aug-2021 16:21
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Aug-2021 16:21
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	04-Aug-2021 16:21
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Aug-2021 16:21
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	04-Aug-2021 16:21
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Aug-2021 16:21
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	04-Aug-2021 16:21
Surr: 1,2-Dichloroethane-d4	*94.2*			**0**	*81-118*	*%REC*	*1*	*04-Aug-2021 16:21*
Surr: 4-Bromofluorobenzene	*99.5*			**0**	*85-114*	*%REC*	*1*	*04-Aug-2021 16:21*
Surr: Dibromofluoromethane	*96.6*			**0**	*80-119*	*%REC*	*1*	*04-Aug-2021 16:21*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*04-Aug-2021 16:21*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

Weight / Prep Log

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071465

Batch ID: 168561 **Start Date:** 28 Jul 2021 15:01 **End Date:** 28 Jul 2021 18:00
Method: 9056 ANIONS SOIL PREP **Prep Code:** 9056_S_PR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS21071465-08		5.0473 (g)	50 (mL)	9.906	120 mL Plastic Neat

Batch ID: 168934 **Start Date:** 10 Aug 2021 10:08 **End Date:**
Method: ALK LEACH **Prep Code:** ALK LEACH PREP

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS21071465-08		5 (grams)	50 (mL)	10	120 mL Plastic Neat

Revision: 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071465

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 168561 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Oil	
HS21071465-08	16EW06-210727	27 Jul 2021 12:35		28 Jul 2021 15:01	29 Jul 2021 06:55	1
Batch ID: 168934 (0)	**Test Name :** ALKALINITY BY SM2320B MOD.				**Matrix:** Oil	
HS21071465-08	16EW06-210727	27 Jul 2021 12:35		10 Aug 2021 10:08	10 Aug 2021 22:20	1
Batch ID: R388774 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** GW	
HS21071465-01	16RW10-210727	27 Jul 2021 07:15			03 Aug 2021 13:53	25
HS21071465-01	16RW10-210727	27 Jul 2021 07:15			03 Aug 2021 10:19	1
HS21071465-02	16RW09-210727	27 Jul 2021 08:00			03 Aug 2021 14:13	25
HS21071465-02	16RW09-210727	27 Jul 2021 08:00			03 Aug 2021 10:29	1
HS21071465-06	16WW40-210727	27 Jul 2021 11:05			03 Aug 2021 14:26	25
HS21071465-06	16WW40-210727	27 Jul 2021 11:05			03 Aug 2021 10:40	1
Batch ID: R388888 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21071465-09	Trip Blank-210727	27 Jul 2021 00:00			04 Aug 2021 16:21	1
Batch ID: R388888 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** GW	
HS21071465-01	16RW10-210727	27 Jul 2021 07:15			04 Aug 2021 21:37	5
HS21071465-06	16WW40-210727	27 Jul 2021 11:05			04 Aug 2021 18:06	1
Batch ID: R388996 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** GW	
HS21071465-01	16RW10-210727	27 Jul 2021 07:15			05 Aug 2021 18:14	25
HS21071465-02	16RW09-210727	27 Jul 2021 08:00			05 Aug 2021 19:17	25
HS21071465-02	16RW09-210727	27 Jul 2021 08:00			05 Aug 2021 18:56	5
HS21071465-06	16WW40-210727	27 Jul 2021 11:05			05 Aug 2021 18:35	25
HS21071465-07	16EW07-210727	27 Jul 2021 11:50			05 Aug 2021 16:29	1000
Batch ID: R388997 (0)	**Test Name :** VOLATILES ORGANICS BY SW8260C				**Matrix:** Oil	
HS21071465-08	16EW06-210727	27 Jul 2021 12:35			05 Aug 2021 16:50	2500
Batch ID: R389291 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B-2011				**Matrix:** GW	
HS21071465-01	16RW10-210727	27 Jul 2021 07:15			11 Aug 2021 12:59	1
HS21071465-02	16RW09-210727	27 Jul 2021 08:00			11 Aug 2021 13:29	1
HS21071465-06	16WW40-210727	27 Jul 2021 11:05			11 Aug 2021 13:44	1
Batch ID: R389546 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** GW	
HS21071465-03	16RW07-210727	27 Jul 2021 08:50			13 Aug 2021 15:39	10
HS21071465-03	16RW07-210727	27 Jul 2021 08:50			13 Aug 2021 14:15	1
HS21071465-04	16RW06-210727	27 Jul 2021 09:35			13 Aug 2021 13:54	1
HS21071465-05	16WW46-210727	27 Jul 2021 10:20			13 Aug 2021 16:00	1
Batch ID: R389775 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Oil	
HS21071465-08	16EW06-210727	27 Jul 2021 12:35			18 Aug 2021 18:16	1

Revision: 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021 **DATES REPORT**
WorkOrder: HS21071465

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R389775 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** GW	
HS21071465-01	16RW10-210727	27 Jul 2021 07:15			18 Aug 2021 18:16	1
HS21071465-02	16RW09-210727	27 Jul 2021 08:00			18 Aug 2021 18:16	1
HS21071465-03	16RW07-210727	27 Jul 2021 08:50			18 Aug 2021 18:16	1
HS21071465-04	16RW06-210727	27 Jul 2021 09:35			18 Aug 2021 18:16	1
HS21071465-05	16WW46-210727	27 Jul 2021 10:20			18 Aug 2021 18:16	1
HS21071465-06	16WW40-210727	27 Jul 2021 11:05			18 Aug 2021 18:16	1
HS21071465-07	16EW07-210727	27 Jul 2021 11:50			18 Aug 2021 18:16	1

Revision: 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071465

QC BATCH REPORT

Batch ID: R388774 (0) **Instrument: FID-4** **Method: DISSOLVED GASES BY RSK-175**

MBLK Sample ID: **MBLK-210803** Units: **mg/L** Analysis Date: **03-Aug-2021 09:48**
Client ID: Run ID: **FID-4_388774** SeqNo: **6212659** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000250	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000250	0.000500								U

LCS Sample ID: **LCS-210803** Units: **mg/L** Analysis Date: **03-Aug-2021 09:58**
Client ID: Run ID: **FID-4_388774** SeqNo: **6212660** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0184	0.00100	0.01804	0	102	75 - 125				
Ethene	0.0157	0.00100	0.0168	0	93.4	75 - 125				
Methane	0.00890	0.000500	0.009647	0	92.2	75 - 125				

LCSD Sample ID: **LCSD-210803** Units: **mg/L** Analysis Date: **03-Aug-2021 10:06**
Client ID: Run ID: **FID-4_388774** SeqNo: **6212661** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0188	0.00100	0.01804	0	104	75 - 125	0.01840	2.06	30	
Ethene	0.0160	0.00100	0.0168	0	95.1	75 - 125	0.01569	1.83	30	
Methane	0.00853	0.000500	0.009647	0	88.5	75 - 125	0.008899	4.18	30	

The following samples were analyzed in this batch: HS21071465-01 HS21071465-02 HS21071465-06

Revision: 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071465

QC BATCH REPORT

Batch ID: R388888 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210804** Units: **ug/L** Analysis Date: **04-Aug-2021 13:11**
Client ID: Run ID: **VOA6_388888** SeqNo: **6215041** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*43.87*	*1.0*	*50*	*0*	*87.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.49*	*1.0*	*50*	*0*	*97.0*	*85 - 114*				
Surr: Dibromofluoromethane	*45.13*	*1.0*	*50*	*0*	*90.3*	*80 - 119*				
Surr: Toluene-d8	*51.3*	*1.0*	*50*	*0*	*103*	*89 - 112*				

LCS Sample ID: **VLCSW-210804** Units: **ug/L** Analysis Date: **04-Aug-2021 12:08**
Client ID: Run ID: **VOA6_388888** SeqNo: **6215040** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.02	1.0	20	0	95.1	80 - 119				
1,1-Dichloroethene	15.94	1.0	20	0	79.7	71 - 131				
1,2-Dichloroethane	18.08	1.0	20	0	90.4	73 - 128				
cis-1,2-Dichloroethene	17.85	1.0	20	0	89.3	78 - 123				
Methylene chloride	18.55	2.0	20	0	92.8	74 - 124				
Trichloroethene	18.57	1.0	20	0	92.8	79 - 123				
Vinyl chloride	16.17	1.0	20	0	80.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.01*	*1.0*	*50*	*0*	*96.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.81*	*1.0*	*50*	*0*	*99.6*	*85 - 114*				
Surr: Dibromofluoromethane	*47.26*	*1.0*	*50*	*0*	*94.5*	*80 - 119*				
Surr: Toluene-d8	*47.6*	*1.0*	*50*	*0*	*95.2*	*89 - 112*				

Revision: 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071465

QC BATCH REPORT

Batch ID: R388888 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21071405-11MS** Units: **ug/L** Analysis Date: **04-Aug-2021 14:36**
Client ID: Run ID: **VOA6_388888** SeqNo: **6215044** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.33	1.0	20	0	96.6	80 - 119				
1,1-Dichloroethene	19	1.0	20	0	95.0	71 - 131				
1,2-Dichloroethane	18.42	1.0	20	0	92.1	73 - 128				
cis-1,2-Dichloroethene	18.58	1.0	20	0	92.9	78 - 123				
Methylene chloride	18.84	2.0	20	0	94.2	74 - 124				
Trichloroethene	23.69	1.0	20	0	118	79 - 123				
Vinyl chloride	19.84	1.0	20	0	99.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.94*	*1.0*	*50*	*0*	*97.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.14*	*1.0*	*50*	*0*	*100*	*85 - 114*				
Surr: Dibromofluoromethane	*47*	*1.0*	*50*	*0*	*94.0*	*80 - 119*				
Surr: Toluene-d8	*51.3*	*1.0*	*50*	*0*	*103*	*89 - 112*				

MSD Sample ID: **HS21071405-11MSD** Units: **ug/L** Analysis Date: **04-Aug-2021 14:57**
Client ID: Run ID: **VOA6_388888** SeqNo: **6215045** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.67	1.0	20	0	98.3	80 - 119	19.33	1.73	20	
1,1-Dichloroethene	18.52	1.0	20	0	92.6	71 - 131	19	2.53	20	
1,2-Dichloroethane	18.53	1.0	20	0	92.7	73 - 128	18.42	0.613	20	
cis-1,2-Dichloroethene	17.68	1.0	20	0	88.4	78 - 123	18.58	4.97	20	
Methylene chloride	18.4	2.0	20	0	92.0	74 - 124	18.84	2.4	20	
Trichloroethene	20.38	1.0	20	0	102	79 - 123	23.69	15	20	
Vinyl chloride	17.86	1.0	20	0	89.3	58 - 137	19.84	10.5	20	
Surr: 1,2-Dichloroethane-d4	*47.82*	*1.0*	*50*	*0*	*95.6*	*81 - 118*	*48.94*	*2.33*	*20*	
Surr: 4-Bromofluorobenzene	*48.89*	*1.0*	*50*	*0*	*97.8*	*85 - 114*	*50.14*	*2.52*	*20*	
Surr: Dibromofluoromethane	*46.96*	*1.0*	*50*	*0*	*93.9*	*80 - 119*	*47*	*0.099*	*20*	
Surr: Toluene-d8	*51.28*	*1.0*	*50*	*0*	*103*	*89 - 112*	*51.3*	*0.0581*	*20*	

The following samples were analyzed in this batch: HS21071465-01 HS21071465-06 HS21071465-09

Revision: 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071465

QC BATCH REPORT

Batch ID: R388996 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210805** Units: **ug/L** Analysis Date: **05-Aug-2021 13:19**
Client ID: Run ID: **VOA6_388996** SeqNo: **6217526** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*45.25*	*1.0*	*50*	*0*	*90.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.65*	*1.0*	*50*	*0*	*99.3*	*85 - 114*				
Surr: Dibromofluoromethane	*46.64*	*1.0*	*50*	*0*	*93.3*	*80 - 119*				
Surr: Toluene-d8	*52.98*	*1.0*	*50*	*0*	*106*	*89 - 112*				

LCS Sample ID: **VLCSW-210805** Units: **ug/L** Analysis Date: **05-Aug-2021 12:16**
Client ID: Run ID: **VOA6_388996** SeqNo: **6217525** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.06	1.0	20	0	100	80 - 119				
1,1-Dichloroethene	16.49	1.0	20	0	82.4	71 - 131				
1,2-Dichloroethane	18.97	1.0	20	0	94.8	73 - 128				
cis-1,2-Dichloroethene	18.67	1.0	20	0	93.4	78 - 123				
Methylene chloride	20.11	2.0	20	0	101	74 - 124				
Trichloroethene	19.16	1.0	20	0	95.8	79 - 123				
Vinyl chloride	16.28	1.0	20	0	81.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*44.28*	*1.0*	*50*	*0*	*88.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.93*	*1.0*	*50*	*0*	*97.9*	*85 - 114*				
Surr: Dibromofluoromethane	*45.44*	*1.0*	*50*	*0*	*90.9*	*80 - 119*				
Surr: Toluene-d8	*45.82*	*1.0*	*50*	*0*	*91.6*	*89 - 112*				

Revision: 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071465

QC BATCH REPORT

Batch ID: R388996 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21080176-03MS** Units: **ug/L** Analysis Date: **05-Aug-2021 17:11**
Client ID: Run ID: **VOA6_388996** SeqNo: **6217536** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.98	1.0	20	0	89.9	80 - 119				
1,1-Dichloroethene	17.33	1.0	20	0	86.6	71 - 131				
1,2-Dichloroethane	17.03	1.0	20	0	85.1	73 - 128				
cis-1,2-Dichloroethene	16.99	1.0	20	0	85.0	78 - 123				
Methylene chloride	16.95	2.0	20	0	84.8	74 - 124				
Trichloroethene	25.44	1.0	20	6.425	95.1	79 - 123				
Vinyl chloride	17.08	1.0	20	0	85.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.44*	*1.0*	*50*	*0*	*90.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.47*	*1.0*	*50*	*0*	*98.9*	*85 - 114*				
Surr: Dibromofluoromethane	*45.67*	*1.0*	*50*	*0*	*91.3*	*80 - 119*				
Surr: Toluene-d8	*50.35*	*1.0*	*50*	*0*	*101*	*89 - 112*				

MSD Sample ID: **HS21080176-03MSD** Units: **ug/L** Analysis Date: **05-Aug-2021 17:32**
Client ID: Run ID: **VOA6_388996** SeqNo: **6217537** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	16.96	1.0	20	0	84.8	80 - 119	17.98	5.87	20	
1,1-Dichloroethene	16.1	1.0	20	0	80.5	71 - 131	17.33	7.36	20	
1,2-Dichloroethane	16.86	1.0	20	0	84.3	73 - 128	17.03	0.984	20	
cis-1,2-Dichloroethene	15.78	1.0	20	0	78.9	78 - 123	16.99	7.39	20	
Methylene chloride	15.55	2.0	20	0	77.8	74 - 124	16.95	8.62	20	
Trichloroethene	23.55	1.0	20	6.425	85.6	79 - 123	25.44	7.72	20	
Vinyl chloride	15.13	1.0	20	0	75.6	58 - 137	17.08	12.1	20	
Surr: 1,2-Dichloroethane-d4	*43.82*	*1.0*	*50*	*0*	*87.6*	*81 - 118*	*45.44*	*3.63*	*20*	
Surr: 4-Bromofluorobenzene	*49.35*	*1.0*	*50*	*0*	*98.7*	*85 - 114*	*49.47*	*0.239*	*20*	
Surr: Dibromofluoromethane	*45.8*	*1.0*	*50*	*0*	*91.6*	*80 - 119*	*45.67*	*0.269*	*20*	
Surr: Toluene-d8	*50.52*	*1.0*	*50*	*0*	*101*	*89 - 112*	*50.35*	*0.341*	*20*	

The following samples were analyzed in this batch: HS21071465-01 HS21071465-02 HS21071465-06 HS21071465-07

Revision: 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071465

QC BATCH REPORT

Batch ID: R388997 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY SW8260C**

MBLK Sample ID: **VBLKM-210805** Units: **ug/Kg** Analysis Date: **05-Aug-2021 12:58**
Client ID: Run ID: **VOA6_388997** SeqNo: **6217552** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	100	250								U
1,1-Dichloroethene	100	250								U
1,2-Dichloroethane	100	250								U
cis-1,2-Dichloroethene	100	250								U
Methylene chloride	100	500								U
Trichloroethene	100	250								U
Vinyl chloride	100	100								U
Surr: Toluene-d8	*2585*	*250*	*2500*	*0*	*103*	*85 - 116*				
Surr: 1,2-Dichloroethane-d4	*2232*	*250*	*2500*	*0*	*89.3*	*71 - 136*				
Surr: 4-Bromofluorobenzene	*2389*	*250*	*2500*	*0*	*95.6*	*79 - 119*				
Surr: Dibromofluoromethane	*2302*	*250*	*2500*	*0*	*92.1*	*78 - 119*				

LCS Sample ID: **VLCSW-210805** Units: **ug/L** Analysis Date: **05-Aug-2021 12:16**
Client ID: Run ID: **VOA6_388997** SeqNo: **6217547** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.06	1.0	20	0	100	80 - 119				
1,1-Dichloroethene	16.49	1.0	20	0	82.4	71 - 131				
1,2-Dichloroethane	18.97	1.0	20	0	94.8	73 - 128				
cis-1,2-Dichloroethene	18.67	1.0	20	0	93.4	78 - 123				
Methylene chloride	20.11	2.0	20	0	101	74 - 124				
Trichloroethene	19.16	1.0	20	0	95.8	79 - 123				
Vinyl chloride	16.28	1.0	20	0	81.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*44.28*	*1.0*	*50*	*0*	*88.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.93*	*1.0*	*50*	*0*	*97.9*	*85 - 114*				
Surr: Dibromofluoromethane	*45.44*	*1.0*	*50*	*0*	*90.9*	*80 - 119*				
Surr: Toluene-d8	*45.82*	*1.0*	*50*	*0*	*91.6*	*89 - 112*				

Revision: 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071465

QC BATCH REPORT

Batch ID: R388997 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY SW8260C**

MS Sample ID: **HS21080176-03MS** Units: **ug/L** Analysis Date: **05-Aug-2021 17:11**
Client ID: Run ID: **VOA6_388997** SeqNo: **6217549** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.98	1.0	20	0	89.9	80 - 119				
1,1-Dichloroethene	17.33	1.0	20	0	86.6	71 - 131				
1,2-Dichloroethane	17.03	1.0	20	0	85.1	73 - 128				
cis-1,2-Dichloroethene	16.99	1.0	20	0	85.0	78 - 123				
Methylene chloride	16.95	2.0	20	0	84.8	74 - 124				
Trichloroethene	25.44	1.0	20	6.425	95.1	79 - 123				
Vinyl chloride	17.08	1.0	20	0	85.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.44*	*1.0*	*50*	*0*	*90.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.47*	*1.0*	*50*	*0*	*98.9*	*85 - 114*				
Surr: Dibromofluoromethane	*45.67*	*1.0*	*50*	*0*	*91.3*	*80 - 119*				
Surr: Toluene-d8	*50.35*	*1.0*	*50*	*0*	*101*	*89 - 112*				

MSD Sample ID: **HS21080176-03MSD** Units: **ug/L** Analysis Date: **05-Aug-2021 17:32**
Client ID: Run ID: **VOA6_388997** SeqNo: **6217550** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	16.96	1.0	20	0	84.8	80 - 119	17.98	5.87	20	
1,1-Dichloroethene	16.1	1.0	20	0	80.5	71 - 131	17.33	7.36	20	
1,2-Dichloroethane	16.86	1.0	20	0	84.3	73 - 128	17.03	0.984	20	
cis-1,2-Dichloroethene	15.78	1.0	20	0	78.9	78 - 123	16.99	7.39	20	
Methylene chloride	15.55	2.0	20	0	77.8	74 - 124	16.95	8.62	20	
Trichloroethene	23.55	1.0	20	6.425	85.6	79 - 123	25.44	7.72	20	
Vinyl chloride	15.13	1.0	20	0	75.6	58 - 137	17.08	12.1	20	
Surr: 1,2-Dichloroethane-d4	*43.82*	*1.0*	*50*	*0*	*87.6*	*81 - 118*	*45.44*	*3.63*	*20*	
Surr: 4-Bromofluorobenzene	*49.35*	*1.0*	*50*	*0*	*98.7*	*85 - 114*	*49.47*	*0.239*	*20*	
Surr: Dibromofluoromethane	*45.8*	*1.0*	*50*	*0*	*91.6*	*80 - 119*	*45.67*	*0.269*	*20*	
Surr: Toluene-d8	*50.52*	*1.0*	*50*	*0*	*101*	*89 - 112*	*50.35*	*0.341*	*20*	

The following samples were analyzed in this batch: HS21071465-08

Revision: 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071465

QC BATCH REPORT

Batch ID: R389546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210813** Units: **ug/L** Analysis Date: **13-Aug-2021 13:12**
Client ID: Run ID: **VOA6_389546** SeqNo: **6230067** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*40.71*	*1.0*	*50*	*0*	*81.4*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.74*	*1.0*	*50*	*0*	*97.5*	*85 - 114*				
Surr: Dibromofluoromethane	*41.25*	*1.0*	*50*	*0*	*82.5*	*80 - 119*				
Surr: Toluene-d8	*49.07*	*1.0*	*50*	*0*	*98.1*	*89 - 112*				

LCS Sample ID: **VLCSW-210813** Units: **ug/L** Analysis Date: **13-Aug-2021 12:09**
Client ID: Run ID: **VOA6_389546** SeqNo: **6230066** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.25	1.0	20	0	101	80 - 119				
1,1-Dichloroethene	17.81	1.0	20	0	89.1	71 - 131				
1,2-Dichloroethane	19.6	1.0	20	0	98.0	73 - 128				
cis-1,2-Dichloroethene	17.58	1.0	20	0	87.9	78 - 123				
Methylene chloride	17.89	2.0	20	0	89.5	74 - 124				
Trichloroethene	21.94	1.0	20	0	110	79 - 123				
Vinyl chloride	17.19	1.0	20	0	85.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*42.38*	*1.0*	*50*	*0*	*84.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.25*	*1.0*	*50*	*0*	*96.5*	*85 - 114*				
Surr: Dibromofluoromethane	*42.53*	*1.0*	*50*	*0*	*85.1*	*80 - 119*				
Surr: Toluene-d8	*45.07*	*1.0*	*50*	*0*	*90.1*	*89 - 112*				

Revision: 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071465

QC BATCH REPORT

Batch ID: R389546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21080560-02MS** Units: **ug/L** Analysis Date: **13-Aug-2021 14:57**
Client ID: Run ID: **VOA6_389546** SeqNo: **6230071** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.14	1.0	20	0	90.7	80 - 119				
1,1-Dichloroethene	17.37	1.0	20	0	86.8	71 - 131				
1,2-Dichloroethane	17.47	1.0	20	0	87.3	73 - 128				
cis-1,2-Dichloroethene	15.54	1.0	20	0	77.7	78 - 123				S
Methylene chloride	15.97	2.0	20	0	79.9	74 - 124				
Trichloroethene	21.12	1.0	20	0	106	79 - 123				
Vinyl chloride	15.96	1.0	20	0	79.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*39.85*	*1.0*	*50*	*0*	*79.7*	*81 - 118*				S
Surr: 4-Bromofluorobenzene	*46.91*	*1.0*	*50*	*0*	*93.8*	*85 - 114*				
Surr: Dibromofluoromethane	*41.81*	*1.0*	*50*	*0*	*83.6*	*80 - 119*				
Surr: Toluene-d8	*48.88*	*1.0*	*50*	*0*	*97.8*	*89 - 112*				

MSD Sample ID: **HS21080560-02MSD** Units: **ug/L** Analysis Date: **13-Aug-2021 15:18**
Client ID: Run ID: **VOA6_389546** SeqNo: **6230072** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.92	1.0	20	0	89.6	80 - 119	18.14	1.23	20	
1,1-Dichloroethene	16.84	1.0	20	0	84.2	71 - 131	17.37	3.06	20	
1,2-Dichloroethane	17.56	1.0	20	0	87.8	73 - 128	17.47	0.537	20	
cis-1,2-Dichloroethene	15.09	1.0	20	0	75.5	78 - 123	15.54	2.96	20	S
Methylene chloride	15.66	2.0	20	0	78.3	74 - 124	15.97	2.01	20	
Trichloroethene	20.72	1.0	20	0	104	79 - 123	21.12	1.93	20	
Vinyl chloride	16.01	1.0	20	0	80.0	58 - 137	15.96	0.304	20	
Surr: 1,2-Dichloroethane-d4	*40.09*	*1.0*	*50*	*0*	*80.2*	*81 - 118*	*39.85*	*0.603*	*20*	S
Surr: 4-Bromofluorobenzene	*47.56*	*1.0*	*50*	*0*	*95.1*	*85 - 114*	*46.91*	*1.37*	*20*	
Surr: Dibromofluoromethane	*41.5*	*1.0*	*50*	*0*	*83.0*	*80 - 119*	*41.81*	*0.745*	*20*	
Surr: Toluene-d8	*48.75*	*1.0*	*50*	*0*	*97.5*	*89 - 112*	*48.88*	*0.272*	*20*	

The following samples were analyzed in this batch: HS21071465-03 HS21071465-04 HS21071465-05

Revision: 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071465

QC BATCH REPORT

Batch ID: 168561 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-168561** Units: **mg/Kg** Analysis Date: **29-Jul-2021 06:10**
Client ID: Run ID: **ICS-Integrion_388493** SeqNo: **6206245** PrepDate: **28-Jul-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.00	1.00								U
Nitrogen, Nitrate (As N)	1.00	1.00								U
Sulfate	5.00	5.00								U

LCS Sample ID: **LCS-168561** Units: **mg/Kg** Analysis Date: **29-Jul-2021 06:18**
Client ID: Run ID: **ICS-Integrion_388493** SeqNo: **6206246** PrepDate: **28-Jul-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	38.36	1.00	40	0	95.9	80 - 120				
Nitrogen, Nitrate (As N)	39.27	1.00	40	0	98.2	80 - 120				
Sulfate	198.6	5.00	200	0	99.3	80 - 120				

MS Sample ID: **HS21071416-20MS** Units: **mg/Kg** Analysis Date: **29-Jul-2021 06:33**
Client ID: Run ID: **ICS-Integrion_388493** SeqNo: **6206248** PrepDate: **28-Jul-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	17.95	0.995	19.9	0	90.2	80 - 120				
Nitrogen, Nitrate (As N)	21.08	0.995	19.9	0.4249	104	80 - 120				
Sulfate	527.4	4.98	99.5	447	80.8	80 - 120				O

MSD Sample ID: **HS21071416-20MSD** Units: **mg/Kg** Analysis Date: **29-Jul-2021 06:40**
Client ID: Run ID: **ICS-Integrion_388493** SeqNo: **6206249** PrepDate: **28-Jul-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	18.03	0.995	19.9	0	90.6	80 - 120	17.95	0.416	20	
Nitrogen, Nitrate (As N)	21.12	0.995	19.9	0.4249	104	80 - 120	21.08	0.166	20	
Sulfate	527.3	4.97	99.5	447	80.7	80 - 120	527.4	0.0134	20	O

The following samples were analyzed in this batch: HS21071465-08

Revision: 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071465

QC BATCH REPORT

Batch ID: 168934 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM2320B MOD.**

MBLK Sample ID: **MBLK-168934** Units: **mg/Kg** Analysis Date: **10-Aug-2021 21:42**
Client ID: Run ID: **ManTech01_389210** SeqNo: **6222871** PrepDate: **10-Aug-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	10.0	10.0								U

LCS Sample ID: **LCS-168934** Units: **mg/Kg** Analysis Date: **10-Aug-2021 21:51**
Client ID: Run ID: **ManTech01_389210** SeqNo: **6222872** PrepDate: **10-Aug-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	10410	10.0	10000	0	104	80 - 120				

LCSD Sample ID: **LCSD-168934** Units: **mg/Kg** Analysis Date: **10-Aug-2021 21:59**
Client ID: Run ID: **ManTech01_389210** SeqNo: **6222873** PrepDate: **10-Aug-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	10250	10.0	10000	0	102	80 - 120	10410	1.62	20	

DUP Sample ID: **HS21080162-01DUP** Units: **mg/Kg** Analysis Date: **10-Aug-2021 22:17**
Client ID: Run ID: **ManTech01_389210** SeqNo: **6222875** PrepDate: **10-Aug-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	255.1	10.0					265.9	4.15	20	

The following samples were analyzed in this batch: HS21071465-08

Revision: 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: HS21071465

QC BATCH REPORT

Batch ID: R389291 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B-2011**

MBLK Sample ID: **MBLK-081121** Units: **mg/L** Analysis Date: **11-Aug-2021 11:56**
Client ID: Run ID: **TOC_04_389291** SeqNo: **6224444** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **LCS-08112021** Units: **mg/L** Analysis Date: **11-Aug-2021 12:08**
Client ID: Run ID: **TOC_04_389291** SeqNo: **6224445** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.27	1.00	10	0	103	85 - 115				

LCSD Sample ID: **LCSD-08011021** Units: **mg/L** Analysis Date: **11-Aug-2021 12:20**
Client ID: Run ID: **TOC_04_389291** SeqNo: **6224446** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.49	1.00	10	0	105	85 - 115	10.27	2.12	20	

MS Sample ID: **HS21071465-01MS** Units: **mg/L** Analysis Date: **11-Aug-2021 13:14**
Client ID: **16RW10-210727** Run ID: **TOC_04_389291** SeqNo: **6224450** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	16.35	1.00	10	5.15	112	80 - 120				

The following samples were analyzed in this batch: HS21071465-01 HS21071465-02 HS21071465-06

Revision: 1

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
WorkOrder: **HS21071465**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
Date	
mg/Kg-dry	Milligrams per Kilogram- Dry weight corrected
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	21-022-0	26-Mar-2022
Dept of Defense	PJLA L20-507-R2	22-Dec-2021
Florida	E87611-33	30-Jun-2022
Illinois	2000322021-7	09-May-2022
Kansas	E-10352 2021-2022	31-Jul-2022
Kentucky	123043, 2021-2022	30-Apr-2022
Louisiana	03087, 2021-2022	30-Jun-2022
North Carolina	624-2021	31-Dec-2021
Texas	T104704231-21-28	30-Apr-2022

ALS Houston, US Date: 09-Sep-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 July 2021
Work Order: HS21071465

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS21071465-01	16RW10-210727	Login	7/28/2021 1:50:32 PM	PJM	WET293
HS21071465-01	16RW10-210727	Login	7/28/2021 1:50:32 PM	PJM	Sub
HS21071465-01	16RW10-210727	Login	7/28/2021 1:50:32 PM	PJM	VOA020
HS21071465-01	16RW10-210727	Login	7/28/2021 1:50:32 PM	PJM	RSK027
HS21071465-01	16RW10-210727	Login	7/28/2021 1:50:32 PM	PJM	WET214
HS21071465-02	16RW09-210727	Login	7/28/2021 1:50:32 PM	PJM	WET293
HS21071465-02	16RW09-210727	Login	7/28/2021 1:50:32 PM	PJM	Sub
HS21071465-02	16RW09-210727	Login	7/28/2021 1:50:32 PM	PJM	VOA020
HS21071465-02	16RW09-210727	Login	7/28/2021 1:50:32 PM	PJM	RSK027
HS21071465-02	16RW09-210727	Login	7/28/2021 1:50:32 PM	PJM	WET214
HS21071465-03	16RW07-210727	Login	7/28/2021 1:50:32 PM	PJM	WET293
HS21071465-03	16RW07-210727	Login	7/28/2021 1:50:32 PM	PJM	Sub
HS21071465-03	16RW07-210727	Login	7/28/2021 1:50:32 PM	PJM	VOA020
HS21071465-03	16RW07-210727	Login	7/28/2021 1:50:32 PM	PJM	RSK027
HS21071465-03	16RW07-210727	Login	7/28/2021 1:50:32 PM	PJM	WET214
HS21071465-04	16RW06-210727	Login	7/28/2021 1:50:32 PM	PJM	Sub
HS21071465-04	16RW06-210727	Login	7/28/2021 1:50:32 PM	PJM	VOA020
HS21071465-05	16WW46-210727	Login	7/28/2021 1:50:32 PM	PJM	Sub
HS21071465-05	16WW46-210727	Login	7/28/2021 1:50:32 PM	PJM	VOA020
HS21071465-06	16WW40-210727	Login	7/28/2021 1:50:32 PM	PJM	Sub
HS21071465-06	16WW40-210727	Login	7/28/2021 1:50:32 PM	PJM	VOA020
HS21071465-07	16EW07-210727	Login	7/28/2021 1:50:32 PM	PJM	Sub
HS21071465-07	16EW07-210727	Login	7/28/2021 1:50:32 PM	PJM	VOA020
HS21071465-08	16EW06-210727	Login	7/28/2021 1:50:32 PM	PJM	WET293
HS21071465-08	16EW06-210727	Login	7/28/2021 1:50:32 PM	PJM	Sub
HS21071465-08	16EW06-210727	Login	7/28/2021 1:50:32 PM	PJM	VOA020
HS21071465-08	16EW06-210727	Login	7/28/2021 1:50:32 PM	PJM	RSK027
HS21071465-08	16EW06-210727	Login	7/28/2021 1:50:32 PM	PJM	WET214
HS21071465-09	Trip Blank-210727	Login	7/28/2021 1:50:32 PM	PJM	VOA020

Revision:1

ALS Houston, US Date: 09-Sep-21

Sample Receipt Checklist

Work Order ID: HS21071465 **Date/Time Received:** **28-Jul-2021 09:20**

Client Name: CBI-Houston **Received by:** **Paresh M. Giga**

Completed By: */S/ Pablo Marinez* 28-Jul-2021 13:51 **Reviewed by:** */S/ Ragen Giga* 28-Jul-2021 19:01

eSignature Date/Time eSignature Date/Time

Matrices: **WATER** Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:CLIENT
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.5°C UC/C	IR 31
Cooler(s)/Kit(s):	47528	
Date/Time sample(s) sent to storage:	7/28/21 14:05	

Water - VOA vials have zero headspace?	Yes ☐	No ☑	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes: 16EW07-210727 & 16EW06-210727 - All Vials contain >6mm headspace

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modasbia

Project: APTIM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: LHAAP 16 July 2021

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16RW10-210727	W6	7/27/21/0715		9	X	X	X			X						
16RW09-210727	W6	7/27/21/0800		9	X	X	X			X						
16RW07-210727	W6	7/27/21/0850		4	X					X						
16RW06-210727	W6	7/27/21/0935		4	X					X						
16WW46-210727	W6	7/27/21/1020		4	X					X						
16WW40-210727	W6	7/27/21/1105		9	X	X	X			X						
16EW07-210727	W6	7/27/21/1150		4	X					X						
16EW06-210727	W6	7/27/21/1235		10	X	X	X	X	X	X						

HS21071465

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant LHAAP 16 July 20

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
[signature]	7/27/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
P.G.	07/28/21	9:20							

Remarks:
475528 UIC 1.5 IR 31
CIF-U

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 601032
Job: **LHAAP 16 July 2021**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D. / Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020			Remarks (Preservatives, etc.)	Lab I.D.#
Trip Blank-210727	w	7/27/21		2	X										

HS21071465

Aptim Environmental & Infrastucture, Inc.

Longhorn Army Ammunition Plant LHAAP 16 July 2(

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	7/27/21	1430									

For Lab Use Only

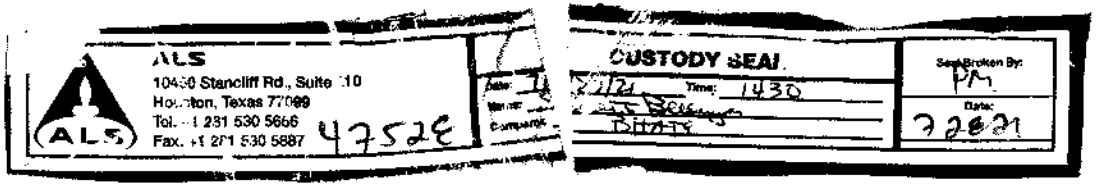
Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
P.G.	07/28/21	9:20							

Remarks:

ULC 1.5 IR31

C/F-0

(Word) S:\I-cos\Forms\Chain of Custody - BiWeekly


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
47526
CUSTODY SEAL
Time: 1430
Seal Broken By:
PM
Date:
72821


FedEx.
TRK# 0721 9473 0845 1390
WED - 28 JUL AA
PRIORITY OVERNIGHT
AB SGRA
47526
77099
TX-US
IAH

August 18, 2021 Service Request No:E2100891

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

Laboratory Results for: HS21071465

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory July 28, 2021
For your reference, these analyses have been assigned our service request number **E2100891.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100891
Project:	HS21071465	**Date Received:**	07/28/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Eight samples were received for analysis at ALS Environmental in Houston on 7/28/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samplse were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100475 & EQ2100477: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for these extraction batches. The LCS and DLCS recoveries are within QC limits. MS/MSD were performed on unrelated samples.

Lowest practical dilution performed (matrix interference) for samples E2100891-002 through E2100891-006. Sample 16EW06-210727 the lab prep and analyze as a solid.

DoD certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2100891
Project: HS21071465

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100891-001	16RW10-210727	7/27/2021	0715
E2100891-002	16RW09-210727	7/27/2021	0800
E2100891-003	16RW07-210727	7/27/2021	0850
E2100891-004	16RW06-210727	7/27/2021	0935
E2100891-005	16WW46-210727	7/27/2021	1020
E2100891-006	16WW40-210727	7/27/2021	1105
E2100891-007	16EW07-210727	7/27/2021	1150
E2100891-008	16EW06-210727	7/27/2021	1235

Service Request Summary

Folder #: **E2100891**
Client Name: ALS Environmental - US
Project Name: HS21071465
Project Number:

Report To: Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 07/28/21
Internal Due Date: 8/11/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21071465
EDD: No EDD Specified

8 120 mL-Plastic Bottle Natural WM Unpreserved
Location: EHRMS-AirArch 1
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100891-001	16RW10-210727	Ground Water	07/27/21 0715	**IV**
E2100891-002	16RW09-210727	Ground Water	07/27/21 0800	**IV**
E2100891-003	16RW07-210727	Ground Water	07/27/21 0850	**IV**
E2100891-004	16RW06-210727	Ground Water	07/27/21 0935	**IV**
E2100891-005	16WW46-210727	Ground Water	07/27/21 1020	**IV**
E2100891-006	16WW40-210727	Ground Water	07/27/21 1105	**IV**
E2100891-007	16EW07-210727	Liquid	07/27/21 1150	**IV**
E2100891-008	16EW06-210727	Liquid	07/27/21 1235	**IV**

Service Request Summary

Folder #: **E2100891**
Client Name: ALS Environmental - US
Project Name: HS21071465
Project Number:

Report To: Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 07/28/21
Internal Due Date: 8/11/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21071465
EDD: No EDD Specified

8 120 mL-Plastic Bottle Natural WM Unpreserved
Location: EHRMS-AirArch 1
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	8	IV due 8/18

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arkansas Department of Environmental Quality	19-028-0	6/30/2022
Arkansas Department of Environmental Quality	21-022-0	3/26/2022
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-33	6/30/2022
Hawaii Department of Health	2021-2022	4/30/2022
Kansas Department of Health and Environment	E-10352 2022	7/31/2022
Louisiana Department of Environmental Quality	03087-2021	6/30/2022
Louisiana Department of Health and Hospitals	LA028-2021	12/31/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Minnesota Department of Health	2021671	12/31/2021
Nevada Department of Concervation and Natural Resources	TX026932022-1	7/31/2022
New Hampshire Environmental Laboratory Accreditation Program	209421	4/24/2022
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	68-03441-015	6/30/2022
Tennessee Department of Environment and Concervation	04016-2021	4/30/2022
Texas Commision on Environmental Quality	T104704231-21-27	4/30/2022
United States Department of Agriculture	P330-19-00299	10/10/2022

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

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Houston, TX 77099
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F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **16583**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	Ragen Giga
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RagenP.Giga@ALSGlobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS21071465
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21071465-01**	**16RW10-210727**	**GW**	**27 Jul 2021 07:15**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			11 Aug 2021
2.	**HS21071465-02**	**16RW09-210727**	**GW**	**27 Jul 2021 08:00**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			11 Aug 2021
3.	**HS21071465-03**	**16RW07-210727**	**GW**	**27 Jul 2021 08:50**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			11 Aug 2021
4.	**HS21071465-04**	**16RW06-210727**	**GW**	**27 Jul 2021 09:35**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			11 Aug 2021
5.	**HS21071465-05**	**16WW46-210727**	**GW**	**27 Jul 2021 10:20**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			11 Aug 2021
6.	**HS21071465-06**	**16WW40-210727**	**GW**	**27 Jul 2021 11:05**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			11 Aug 2021
7.	**HS21071465-07**	**16EW07-210727**	**GW**	**27 Jul 2021 11:50**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			11 Aug 2021
8.	**HS21071465-08**	**16EW06-210727**	**GW**	**27 Jul 2021 12:35**

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 16583**

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.		11 Aug 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 7-28-21 14:25

Received By: COREY G Date/Time: 7/28/21 1425

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

Cooler Receipt Form

Project Chemist CA

Client/Project ALS-H

Thermometer ID IR11

Date/Time Received: 7/28/21 Initials: CA

Date/Time Logged in: 7/28/21 Initials CA

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ◉ ALS Courier ○ Client

2. Samples received in: ◉ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ◉ No

Were they intact? ○ Yes ○ No ◉ N/A

Were they signed and dated? ○ Yes ○ No ◉ N/A

If yes, how many and where?

4. Packing Material: ○ Inserts ◉ Baggies ○ Bubble Wrap ○ Gel Packs ◉ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ◉ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		7/28/21	1425	CA	5.5	☑
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ◉ Yes ○ No

7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ○ Yes ○ No

8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ◉ Yes ○ No

9. Were appropriate bottles/containers and volumes received for the requested tests? ◉ Yes ○ No

10. Did sample labels and tags agree with custody documents? ◉ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 384371 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 8/2/21 10:30

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100845-001	OBFOD-MW01	.01	6850/ClO4 DOD			Water	10mL	
2	E2100845-002	OBFOD-1	.01	6850/ClO4 DOD			Water	10mL	
3	E2100845-003	OBFOB-MW01	.01	6850/ClO4 DOD			Water	10mL	
4	E2100845-004	OBFOB-MW03	.01	6850/ClO4 DOD			Water	10mL	
5	E2100845-005	OBF-2	.01	6850/ClO4 DOD			Water	10mL	
6	E2100845-006	OBFOB-MW02	.01	6850/ClO4 DOD			Water	10mL	
7	E2100845-007	JOD-MW01	.01	6850/ClO4 DOD			Water	10mL	
8	E2100845-008	JOD-MW02	.01	6850/ClO4 DOD			Water	10mL	
9	E2100845-009	JOD-MW03	.01	6850/ClO4 DOD			Water	10mL	
10	E2100845-010	JOD-MW04	.01	6850/ClO4 DOD			Water	10mL	
11	E2100845-011	DUP-01	.01	6850/ClO4 DOD			Water	10mL	
12	E2100845-012	DUP-02	.01	6850/ClO4 DOD			Water	10mL	
13	E2100891-001	16RW10-210727	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2100891-002	16RW09-210727	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2100891-003	16RW07-210727	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2100891-004	16RW06-210727	.01	6850/ClO4 DOD			Ground Water	10mL	
17	E2100891-005	16WW46-210727	.01	6850/ClO4 DOD			Ground Water	10mL	
18	E2100891-006	16WW40-210727	.01	6850/ClO4 DOD			Ground Water	10mL	
19	EQ2100475-01	MB		6850/ClO4 DOD			Liquid	10mL	
20	EQ2100475-02	LCS		6850/ClO4 DOD			Liquid	10mL	
21	EQ2100475-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
22	EQ2100475-04	JOD-MW01 MS	.01	6850/ClO4 DOD			Liquid	10mL	
23	EQ2100475-05	JOD-MW01 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 214765 Logbook Ref: Sodium Perchlorate Expires On: 12/11/2022

E2100845-003 100.00µL EQ2100475-01 100.00µL EQ2100475-02 100.00µL EQ2100475-03 100.00µL EQ2100475-04 100.00µL EQ2100475-05 100.00µL

Name: Perchlorate Intermediate Stock1 Inventory ID 217422 Logbook Ref: Perchlorate Expires On: 11/26/2021

EQ2100475-02 1.00µL EQ2100475-03 1.00µL EQ2100475-04 1.00µL EQ2100475-05 1.00µL

Preparation Information Benchsheet

Prep Run#: 384371 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 8/2/21 10:30

Preparation Steps

Step: Preparation
Started: 8/2/21 10:30
Finished: 8/2/21 11:15
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 8/2/21

Chain of Custody

Relinquished By:		Date:		Extracts Examined
Received By:		Date:		Yes No

Preparation Information Benchsheet

Prep Run#: 384372 **Prep WorkFlow:** Gen CLO4 **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 8/2/21 09:31

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100841-001	OB-1	.01	6850/ClO4 DOD			Soil	1.029g	wet sand brown
2	E2100841-002	OB-2	.01	6850/ClO4 DOD			Soil	1.036g	wet sand brown
3	E2100841-003	OB-3	.01	6850/ClO4 DOD			Soil	1.010g	wet sand brown
4	E2100841-004	OB-4	.01	6850/ClO4 DOD			Soil	1.072g	wet sand brown
5	E2100841-005	OB-5	.01	6850/ClO4 DOD			Soil	1.010g	wet sand brown
6	E2100841-006	OB-6	.01	6850/ClO4 DOD			Soil	1.004g	wet sand brown
7	E2100841-007	OB-7	.01	6850/ClO4 DOD			Soil	1.019g	wet sand brown
8	E2100841-008	OB-8	.01	6850/ClO4 DOD			Soil	1.109g	wet sand brown
9	E2100841-009	OB-9	.01	6850/ClO4 DOD			Soil	1.005g	wet sand brown
10	E2100842-001	OB-PAN-1	.01	6850/ClO4 DOD			Soil	0.992g	wet sand brown
11	E2100842-002	OB-PAN-2	.01	6850/ClO4 DOD			Soil	1.083g	wet sand brown
12	E2100842-003	OB-PAN-3	.01	6850/ClO4 DOD			Soil	1.053g	wet sand brown
13	E2100842-004	OB-PAN-4	.01	6850/ClO4 DOD			Soil	1.010g	wet sand brown
14	E2100842-005	OB-PAN-5	.01	6850/ClO4 DOD			Soil	1.029g	wet sand brown
15	E2100842-006	OB-PAN-6	.01	6850/ClO4 DOD			Soil	1.022g	wet sand brown
16	E2100891-007	16EW07-210727	.01	6850/ClO4 DOD			Liquid	1.00g	
17	E2100891-008	16EW06-210727	.01	6850/ClO4 DOD			Liquid	1.00g	
18	EQ2100477-01	MB		6850/ClO4 DOD			Solid	0.998g	
19	EQ2100477-02	LCS		6850/ClO4 DOD			Solid	1.046g	
20	EQ2100477-03	DLCS		6850/ClO4 DOD			Solid	1.080g	
21	EQ2100477-04	OB-9 MS	.01	6850/ClO4 DOD			Solid	1.009g	
22	EQ2100477-05	OB-9 DMS	.01	6850/ClO4 DOD			Solid	1.004g	
23	EQ2100477-06	OB-PAN-6 MS	.01	6850/ClO4 DOD			Solid	1.027g	
24	EQ2100477-07	OB-PAN-6 DMS	.01	6850/ClO4 DOD			Solid	1.048g	

Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 214765 Logbook Ref: Sodium Perchlorate Expires On: 12/11/2022

E2100841-001	100.00µL	E2100841-002	100.00µL	E2100841-003	100.00µL	E2100841-004	100.00µL	E2100841-005	100.00µL	E2100841-006	100.00µL
E2100841-007	100.00µL	E2100841-008	100.00µL	E2100841-009	100.00µL	E2100842-001	100.00µL	E2100842-002	100.00µL	E2100842-003	100.00µL
E2100842-004	100.00µL	E2100842-005	100.00µL	E2100842-006	100.00µL	EQ2100477-01	100.00µL	EQ2100477-02	100.00µL	EQ2100477-03	100.00µL
EQ2100477-04	100.00µL	EQ2100477-05	100.00µL	EQ2100477-06	100.00µL	EQ2100477-07	100.00µL				

Name: Perchlorate Intermediate Stock1 Inventory ID 217422 Logbook Ref: Perchlorate Expires On: 11/26/2021

EQ2100477-02	100.00µL	EQ2100477-03	100.00µL	EQ2100477-04	100.00µL	EQ2100477-05	100.00µL	EQ2100477-06	100.00µL	EQ2100477-07	100.00µL

Preparation Information Benchsheet

Prep Run#: 384372 **Prep WorkFlow:** Gen CLO4 **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 8/2/21 09:31

Preparation Materials

Water HPLC Grade	07/01/2021 Water (217918)	537M Glass Culture Tubes	537M Glass Tubes (218064)

Preparation Steps

Step: Extraction
Started: 8/2/21 09:31
Finished: 8/2/21 15:02
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 8/2/21

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined

Received By: _____ Date: _____ Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100891
Project:	HS21071465	**Date Collected:**	7/27/21 0715
Sample Matrix:	Ground Water	**Date Received:**	7/28/21
Sample Name:	16RW10-210727	**Units:**	µg/L
Lab Code:	E2100891-001	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**18.7**		4.00	2.00	1.00	40	8/ 2/21	8/18/21 16:02	384371	735470	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100891
Project:	HS21071465	**Date Collected:**	7/27/21 0800
Sample Matrix:	Ground Water	**Date Received:**	7/28/21
Sample Name:	16RW09-210727	**Units:**	µg/L
Lab Code:	E2100891-002	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	2.00	1.00	0.500	20	8/ 2/21	8/18/21 13:21	384371	735470	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100891
Project:	HS21071465	**Date Collected:**	7/27/21 0850
Sample Matrix:	Ground Water	**Date Received:**	7/28/21
Sample Name:	16RW07-210727	**Units:**	µg/L
Lab Code:	E2100891-003	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	8/ 2/21	8/18/21 14:23	384371	735470	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100891
Project:	HS21071465	**Date Collected:**	7/27/21 0935
Sample Matrix:	Ground Water	**Date Received:**	7/28/21
Sample Name:	16RW06-210727	**Units:**	µg/L
Lab Code:	E2100891-004	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	2.00	1.00	0.500	20	8/ 2/21	8/18/21 15:47	384371	735470	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100891
Project:	HS21071465	**Date Collected:**	7/27/21 1020
Sample Matrix:	Ground Water	**Date Received:**	7/28/21
Sample Name:	16WW46-210727	**Units:**	µg/L
Lab Code:	E2100891-005	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	2.00	1.00	0.500	20	8/ 2/21	8/18/21 16:18	384371	735470	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100891
Project:	HS21071465	**Date Collected:**	7/27/21 1105
Sample Matrix:	Ground Water	**Date Received:**	7/28/21
Sample Name:	16WW40-210727	**Units:**	µg/L
Lab Code:	E2100891-006	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.693**	J	1.00	0.500	0.250	10	8/ 2/21	8/18/21 12:55	384371	735470	