LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

ADMINISTRATIVE RECORD

Volume 4

2022

Bate Stamp Numbers
01077057 – 01079014

Prepared for

Department of the Army
Longhorn Army Ammunition Plant

1976–2022

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

VOLUME 4

2022

A.	Title:	(Cont.) Report – Draft Final Pre-Design Investigation Report, LHAAP-18/24, Burning Ground No. 3 and Unlined Evaporation Pond, Longhorn Army Ammunition Plant, Karnack, Texas
	Author(s):	Department of the Army
	Recipient:	U.S. Environmental Protection Agency and Texas Commission on Environmental Quality
	Date:	February 24, 2022
	Bate Stamp:	01077057 – 01077222
B.	Title:	Report – Draft Final Seventh Annual Remedial Action Operation Report, LHAAP-50 Former Sump Water Tank, Longhorn Army Ammunition Plant, Karnack, Texas, March 2022
	Author(s):	Department of the Army
	Recipient:	U.S. Environmental Protection Agency and Texas Commission on Environmental Quality
	Date:	March 1, 2022
	Bate Stamp:	01077223 – 01078724
C.	Title:	(Cont.) Report – Draft Final Seventh Annual Remedial Action Operation Report, LHAAP-50 Former Sump Water Tank, Longhorn Army Ammunition Plant, Karnack, Texas, March 2022
	Author(s):	Department of the Army
	Recipient:	U.S. Environmental Protection Agency and Texas Commission on Environmental Quality
	Date:	March 1, 2022
	Bate Stamp:	01078725 – 01079014

01077057

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804, the proponent agency is CECW-EG	2. DIVISION —	3. INSTALLATION LHAAP	SHEET 1 OF 4 SHEETS

4. PROJECT LHAAP 18/24	13. SIZE AND TYPE OF BIT 2 1/4" DIAMETER
5. LOCATION (Coordinates or Station) LHAAP	14. DATUM FOR ELEVATION SHOWN (TBM or MSL) —
6. DRILLING AGENCY WHE	15. MANUFACTURERS DESIGNATION OF DRILL GEOPROBE 7822DT
7. HOLE NUMBER (as shown on drawing title and title number) 1824DPT28	16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED — ; b. UNDISTURBED ~
8. NAME OF DRILLER KERRI POWELL	17. TOTAL NUMBER CORE BOXES ~
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.	18. ELEVATION GROUND WATER —
10. THICKNESS OF OVERBURDEN ~	19. DATE HOLE (YYYYMMDD): a. STARTED 06/11/21 ; b. COMPLETED 06/11/2021
11. DEPTH DRILLED INTO ROCK —	20. ELEVATION TOP OF HOLE (feet) ~
12. TOTAL DEPTH OF HOLE 42' BGS	21. TOTAL CORE RECOVERY FOR BORING % ~
	22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1 2 3 4	SILTY CLAY, DARK BRWN. TO REDDISH BRWN., SOFT, LOW PLAST., WET	2/4 %		
		5 6 7 8	CLAY W/ TRACE SAND, MED. STIFF, HIGH PLAST., MOIST, LT. BRWN TO GREY	4/4 %		
		9		%		

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent) PROJECT HOLE NUMBER

VER 2.00 1.2

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE: —

2. HOLE NUMBER: 1824DPT28

SHEET 2 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	10		SAA, STIFF	4/4 %		
	11			%		
	12					
	13		SAA, SAND LENSES THROUGHOUT	% 4/4		
	14			%		
	15			%		
	16					
	17		SAA, MOTTLED REDDISH BRWN., LT. BRWN. & GREY, INCREASING SAND	% 4/4		
	18			%		
	19			%		
	20					
	21		SAA	% 3.5/4		
	22			%		
	23		CLAYEY SAND, LT. BROWN TO GREY, MED. GRAIN, COHESIVE, MOIST	%		
	24					

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT28

SHEET 3 OF 4 SHEETS

PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		25	SILTY SAND, LT. BROWN TO GREY, MED. TO COARSE, COHESIVE, WET	4/4 %		
		26				
		27		%		
		28	CLAY, STIFF, LT. BROWN TO GREY, HIGH PLAST., MOIST	2/2 %		
		29				
		30	SAA	2/2 %		
		31				
		32	SAA, GREY	2/2 %		
		33				
		34	SAA LT. BROWN TO GREY	2/2 %		
		35				
		36	SAA, LT. BROWN, REDDISH BROWN & GREY	2/2 %		
		37				
		38		%		
		39				

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

01077060

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT28

SHEET 4 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		40	SAA, DARK BRWN. TO GREY	2/2 %		
		41	CLAYEY SILT W/ SAND, LT. BROWN, SOFT, LOW PLAST., MOIST TO WET	2/2 %		SET WELL 32'-42' BGS
		42	CLAY, DARK BROWN TO GREY, STIFF, HIGH PLAST, MOIST			
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

01077061

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.	2. DIVISION	3. INSTALLATION LHAAP	SHEET 1 OF 4 SHEETS
4. PROJECT LHAAP 18/24		13. SIZE AND TYPE OF BIT 2¼" DIAMETER	
5. LOCATION (Coordinates or Station) KARNACK, TX		14. DATUM FOR ELEVATION SHOWN (TBM or MSL) —	
6. DRILLING AGENCY WHE		15. MANUFACTURERS DESIGNATION OF DRILL GEOPROBE 7822DT	
7. HOLE NUMBER (as shown on drawing title and title number) 1824DPT29		16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN a. DISTURBED — b. UNDISTURBED —	
8. NAME OF DRILLER KERRI POWELL		17. TOTAL NUMBER CORE BOXES —	
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.		18. ELEVATION GROUND WATER —	
10. THICKNESS OF OVERBURDEN —		19. DATE HOLE (YYYYMMDD) a. STARTED 06/10/21 b. COMPLETED 06/10/21	
11. DEPTH DRILLED INTO ROCK —		20. ELEVATION TOP OF HOLE (feet) —	
12. TOTAL DEPTH OF HOLE		21. TOTAL CORE RECOVERY FOR BORING % —	
		22. SIGNATURE OF INSPECTOR	

23. a. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	SANDY CLAY, REDDISH BRWN. TO DARK BROWN, MED. STIFF, MED. PLAST., DRY TO MOIST	2.75 %		
		2		4 %		
		3		%		
		4	SILTY CLAY W/ SAND, MOTTLED LT. BROWN, RED, GREY, SOFT, MED. PLAST., MOIST	2.75 %		
		5		4 %		
		6				
		7		%		
		8				
		9		%		

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent) PROJECT HOLE NUMBER

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DP129

SHEET 2 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		10	SANDY CLAY, MED. STIFF, LOW PLAST., LT. BROWN TO GREY, MOIST	4/4 %		
		11	CLAYEY SAND, LT BROWN TO GREY, MED., COHESIVE, MOIST	%		
		12				
		13	SAA	3.75/4 %		
		14		%		
		15		%		
		16				
		17	SAA	2.75/4 %		
		18	SANDY CLAY W/ SILT, LT. BROWN, MED. STIFF, ~~LOW PLAST~~ MED. PLAST., WET	%		
		19		%		
		20				
		21	SAA	2.5/4 %		
		22	CLAYEY SAND, MOTTLED ORANGE & GREY, MED TO COARSE, COHESIVE, MOIST	%		
		23		%		
		24				

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT29

SHEET 3 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		25	SAA	%		
		26		4/4 %		
		27				
		28	CLAY, MOTTLED ORANGE & GREY, MED STIFF, HIGH PLAST., MOIST	%		
		29	SILTY SAND, LT. BROWN TO GREY, MED. TO COARSE, WET, COHESIVE	2/2 %		SET 1824DPT29A SCREEN 20'-30' BGS
		30	SILTY CLAY, LT. BROWN, SOFT, MED. PLAST., MOIST			
		31	CLAYEY SILT, LT. BROWN, SOFT, LOW PLAST, WET	2/2 %		
		32		%		
		33	SILTY CLAY, LT. BROWN TO ORANGE, SOFT, MED. PLAST, MOIST	2/2 %		
		34				
		35	SAA, SOME SAND, WET	2/2 %		
		36	CLAYEY SAND, LT. BROWN & GREY, FINE TO MED. COHESIVE, MOIST	%		
		37	SILTY SAND W/ CLAY, LT. BROWN TO GREY, FINE, COHESIVE, WET	2/2 %		
		38				
		39	SAA	2/2 %		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

01077064

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT29

SHEET 4 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		40		%		
			CLAY W/ TRACE SAND, LT. BROWN TO ORANGE, STIFF, HIGH PLAST., WET	2/2		
		41	CLAYEY SAND, MED. TO COARSE, LT. BROWN, WET	%		
		42				
			CLAY, LT. BROWN TO ORANGE, STIFF, HIGH PLAST., MOIST	2/2		SET 1824DPT29 SCREEN 34'-44' BGS
		43		%		
		44		%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

01077065

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804, the proponent agency is CECW-EG	2. DIVISION	3. INSTALLATION LHAAP	SHEET 1 OF 4 SHEETS
4. PROJECT LHAAP 18/24		13. SIZE AND TYPE OF BIT 2¼" DIAMETER	
		14. DATUM FOR ELEVATION SHOWN (TBM or MSL) —	
5. LOCATION (Coordinates or Station) KARNACK, TX		15. MANUFACTURERS DESIGNATION OF DRILL GEOPROBE 7822DT	
6. DRILLING AGENCY WHE		16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN a. DISTURBED — b. UNDISTURBED —	
7. HOLE NUMBER (as shown on drawing title and title number) 1824DPT30		17. TOTAL NUMBER CORE BOXES —	
8. NAME OF DRILLER KERRI POWELL		18. ELEVATION GROUND WATER —	
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.		19. DATE HOLE (YYYYMMDD) a. STARTED 06/10/21 b. COMPLETED 06/10/21	
10. THICKNESS OF OVERBURDEN —		20. ELEVATION TOP OF HOLE (feet) —	
11. DEPTH DRILLED INTO ROCK —		21. TOTAL CORE RECOVERY FOR BORING % —	
12. TOTAL DEPTH OF HOLE		22. SIGNATURE OF INSPECTOR [signature]	

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	CLAYEY SILT, DARK BRWN. TO LT. BRWN., SOFT, LOW PLAST., WET	1.5/4 %		
		2				
		3				
		4	SANDY CLAY W/ SILT, RED TO LT. BRWN., STIFF, MED. PLAST., WET	%		
		5		3/4 %		
		6				
		7				
		8		%		
		9		%		

01077066

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT30

SHEET 2 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	10		SAA, LT. BROWN, SAND LENSE @ ~ 10' BGS	4/4 %		
	11			%		
	12					
	13		SAA, SAND LENSE w/15' BGS	%		
	14			4/4 %		
	15			%		
	16					
	17		CLAYEY SAND, LT. BROWN TO ORANGE, FINE TO MED, ~~COHES~~ BRITTLE, DRY	%		
	18			4/4 %		
	19		SANDY CLAY, LT. BROWN TO ORANGE, SOFT, LOW PLAST., MOIST	%		
	20					
	21		CLAYEY SAND, LT. BROWN TO ORANGE, MED. TO COARSE, COHESIVE, WET	%		
	22			4 %		
	23					
	24			%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT30

SHEET 3 OF 4 SHEETS

PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		25	SAA	%		
		26	SANDY CLAY W/ SILT, LT. BRN. TO LT. GREY, MED STIFF, MED PLAST., WET	4/4 %		
		27		%		
		28	CLAYEY SAND, FINE TO MED., LT. BROWN, COHESIVE, WET	2/2 %		
		29				
		30	~~SANDY CLAY, LT. BROWN, MED. STIFF, MED. PLAST., WET~~ SILTY CLAY, LT. BROWN, SOFT, HIGH PLAST., MOIST TO WET	2/2 %		
		31				
		32	CLAYEY SILT, LT. BROWN, SOFT, LOW PLAST., WET	2/2 %		
		33				
		34	SAA, LT. BROWN TO GREY, WITH SAND	2/2 %		
		35				
		36	~~SAA~~	%		
		37	~~SILTY CLAY, MOTTLED GREY, ORANGE & BROWN, SOFT, MED PLAST., MOIST~~	2/2 %		CLAY, MOTTLED GREY, LT. BROWN, ORANGE, MED. STIFF, HIGH PLAST., MOIST
		38				
		39		%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT30

SHEET 4 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	40		~~SILTY~~ SAA CLAYEY SAND, LT. BROWN, MED. TO COARSE, WET	2/2 %		
	41		SAA	2/2 %		
	42					
	43		SAA	2/2 %		
	44			%		
	45		SAA	2/2 %		DRILLED TOO FAR, PULL OUT OF HOLE & MOVE 3' TO SET WELL 28'-38' BGS
	46			%		
				%		
				%		
				%		
				%		
				%		
				%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

01077069

1. HOLE NUMBER

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: LHAAP

SHEET 1 OF 4 SHEETS

4. PROJECT: LHAAP 18/24

5. LOCATION (Coordinates or Station): KARNACK, TX

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): 1824DPT31

8. NAME OF DRILLER: KERRI POWELL

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: 40'

13. SIZE AND TYPE OF BIT: 2¼" DIAMETER

14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —

15. MANUFACTURERS DESIGNATION OF DRILL: GEOPROBE 7822DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED —; b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER: —

19. DATE HOLE (YYYYMMDD): a. STARTED 06/10/21; b. COMPLETED 06/10/21

20. ELEVATION TOP OF HOLE (feet): —

21. TOTAL CORE RECOVERY FOR BORING %: —

22. SIGNATURE OF INSPECTOR: [signature]

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	0–4		SILTY CLAY, DARK BROWN TO GREY, STIFF, MED TO HIGH PLAST, MOIST TO WET	1.5/4 %		
	4–8		SILTY SAND W/ CLAY, BRITTLE, DARK BROWN TO GREY, FINE TO MED., DRY	2.75/4 %		
	8–9		SAA	%		

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

PROJECT

HOLE NUMBER

VERSION 1.1

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT31

SHEET 2 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	10		CLAYEY SILT W/ SAND, BROWN TO LT. GREY, LOOSE, LOW PLAST., DRY	3.25/4 %		
	11			%		
	12		CLAYEY SAND, LT. BROWN, FINE, COHESIVE, MOIST			
	13		SILTY SAND, MOTLED BRWN. & ORANGE, FINE, COHESIVE, MOIST	%		
	14		CLAYEY SAND, LT. BROWN TO GREY, FINE, COHESIVE, MOIST	3/4 %		
	15			%		
	16					
	17		CLAYEY SAND W/ SILT, MOTLED ORANGE, GREY, LT. BROWN, FINE TO MED, COHESIVE, MOIST	% 3.25/4 %		
	18					
	19		SANDY SILT W/ CLAY, LT. BROWN TO GREY, LOW PLAST., MOIST	%		
	20		CLAYEY SAND, LT. BROWN, MED TO COARSE, COHESIVE, WET	%		
	21			3.25/4 %		
	22			%		
	23		SILT, LT. BROWN TO ORANGE, SOFT, LOW PLAST, WET	%		
	24					

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT31

SHEET 3 OF 4 SHEETS

PROJECT: LHAAP 18/24

4. INSTALLATION: LHAA

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
			SAA			
	25		CLAYEY SAND W/ SILT, LT. BROWN, MED., COHESIVE, WET	% 3/4		
	26		SANDY CLAY, W/ SILT, MED. STIFF, MED. PLAST., ORANGE TO LT. BROWN, MOIST TO WET	%		
	27			%		
	28		SILTY CLAY, LT. BROWN TO GREY, SOFT, MED TO HIGH PLAST.	% 2/2		
	29					
	30		CLAYEY SILT W/ SAND, LT. BROWN, SOFT, MED. PLAST., WET	% 2/2		
	31		SANDY CLAY, LT BROWN TO GREY, FINE, LOW PLAST, MOIST TO WET	%		
	32		CLAYEY SAND, LT. BROWN TO ORANGE, MED TO COARSE, COHESIVE, WET	% 2/2		
	33					
	34		SANDY SILT, LT. BROWN, SOFT, WET, LOW PLAST.	% 2/2		
	35					
	36		SAA	% 2/2		
	37			%		
	38		~~SILTY CLAY, LT. BROWN, SOFT, WET, HIGH~~ MED PLAST	%		
	39			%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT31

SHEET 4 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		40	CLAY, LT. BROWN TO GREY, MED. STIFF, HIGH PLAST., WET	%		SET WELL 30'-40' BGS
		41		%		
		42		%		
		43		%		
		44		%		
		45		%		BORING LOCATION @ LOW ELEVATION, SURFACE WATER MAY ENTER BORING
				%		
				%		
				%		
				%		
				%		
				%		
				%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

01077073

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.	2. DIVISION	3. INSTALLATION LHAAP	SHEET 1 OF 4 SHEETS
4. PROJECT LHAAP 18/24		13. SIZE AND TYPE OF BIT 2 1/4" DIAMETER	
5. LOCATION *(Coordinates or Station)* LHAAP		14. DATUM FOR ELEVATION SHOWN *(TBM or MSL)* —	
		15. MANUFACTURERS DESIGNATION OF DRILL GEOPROBE 7822DT	
6. DRILLING AGENCY WHE		16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN a. DISTURBED ~ b. UNDISTURBED -	
7. HOLE NUMBER *(as shown on drawing title and title number)* 1824DPT32		17. TOTAL NUMBER CORE BOXES ~	
8. NAME OF DRILLER KERRI POWELL		18. ELEVATION GROUND WATER ~	
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.		19. DATE HOLE *(YYYYMMDD)* a. STARTED 06/08/21 b. COMPLETED 06/08/21	
10. THICKNESS OF OVERBURDEN —		20. ELEVATION TOP OF HOLE *(feet)* ~	
11. DEPTH DRILLED INTO ROCK —		21. TOTAL CORE RECOVERY FOR BORING % —	
12. TOTAL DEPTH OF HOLE 42' BGS		22. SIGNATURE OF INSPECTOR	

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		1	CLAYEY SILT, DARK BROWN, LOW PLAST., WET	%		
		2		2/4 %		
		3	SILTY CLAY, LT. BROWN, SOFT, LOW TO MED. PLAST., WET.	%		
		4				
		5	SILTY CLAY W/ TRACE SAND, REDDISH BROWN TO LT. BROWN, STIFF, MED. TO HIGH PLAST., MOIST	% 3/4		
		6				
		7		%		
		8	SAA, MED. STIFF	4/4 %		
		9				

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1604; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT32

SHEET 2 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		10		%		
		11		%		
		12		%		
		13	SAA, INCREASING SAND, LT. BROWN TO GREY	4/4		
		14		%		
		15		%		
		16	SAA	%		
		17		4/4		
		18	SILTY SAND W/ CLAY, LT. BROWN TO ORANGE, FINE TO MED, COHESIVE, MOIST	%		
		19		%		
		20		%		
		21	SAA, MED. TO COARSE, MOTLED LT. BROWN, ORANGE & GREY	4/4		
		22		%		
		23		%		
		24		%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT32

SHEET 3 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		25	SAA, MOIST TO WET, LT. BROWN TO ORANGE	3,5/4 %		
		26				
		27		%		
		28		%		SWITCH TO 2' RUNS
		29	SAA, INCREASING CLAY	2/2 %		
		30		%		
		31	SANDY CLAY W/ SILT, SOFT, MED. PLAST., WET, LT. BROWN TO GREY	2/2 %		
		32				
		33	SANDY SILT W/ CLAY, LT. BROWN, LOW PLAST., SOFT, WET	2/2 %		
		34				
		35	SILTY SAND, LT. BROWN, ~~MED. GRAIN,~~ NON COHESIVE, WET MED. TO COARSE	2/2 %		
		36		%		
		37	SILTY CLAY W/ SAND, MED. PLAST., LT. BROWN TO ORANGE, WET, SOFT	2/2 %		
		38				
		39	CLAYEY SAND W/ SILT, LT. BROWN, MED. TO FINE, COHESIVE, WET	2/2 %		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT32

SHEET 4 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		40		%		
			SAA			CLAY REACHED @ 41' BGS, SET WELL SCREEN 32'-42' BGS
		41		2/2 %		
			CLAY, LT. BROWN TO ORANGE, HIGH PLAST., STIFF, MOIST			
		42		%		
		43		%		
		44		%		
		45		%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

01077077

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG	2. DIVISION	3. INSTALLATION LHAAP	SHEET 1 OF 4 SHEETS
4. PROJECT LHAAP 18/24		13. SIZE AND TYPE OF BIT 2 1/4" DIAMETER	
5. LOCATION (Coordinates or Station) KARNACK, TX		14. DATUM FOR ELEVATION SHOWN (TBM or MSL) —	
		15. MANUFACTURERS DESIGNATION OF DRILL GEOPROBE 7822DT	
6. DRILLING AGENCY WHE		16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED — b. UNDISTURBED —	
7. HOLE NUMBER (as shown on drawing title and title number) 1824DPT33		17. TOTAL NUMBER CORE BOXES —	
8. NAME OF DRILLER KERRI POWELL		18. ELEVATION GROUND WATER —	
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.		19. DATE HOLE (YYYYMMDD): a. STARTED 06/09/21 b. COMPLETED 06/09/21	
10. THICKNESS OF OVERBURDEN —		20. ELEVATION TOP OF HOLE (feet) —	
11. DEPTH DRILLED INTO ROCK —		21. TOTAL CORE RECOVERY FOR BORING % —	
12. TOTAL DEPTH OF HOLE 42' BGS		22. SIGNATURE OF INSPECTOR [signature]	

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	SANDY SILT W/ CLAY, DARK BROWN, SOFT, WET, LOW PLAST.	1.75/4 %		
		2				
		3	CLAY, RED, STIFF, HIGH PLAST., MOIST	%		
		4	SANDY CLAY, MOTTLED LT. BROWN, RED, GREY, STIFF, MED. PLAST., DRY TO MOIST	%		
		5				
		6	SILTY CLAY W/ SAND, LT. BROWN TO GREY, SOFT, MED. PLAST., ~~WET~~ DAMP MOIST	3/4 %		
		7				
		8		%		
		9		%		

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent) PROJECT HOLE NUMBER

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT33

SHEET 2 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	10		SANDY CLAY, MOTTLED REDDISH BRWN. & GREY, MED STIFF, MED. PLAST., MOIST	3.75/4 %		
	11		SILTY SAND W/ CLAY, ORANGISH BRWN. TO GREY, COHESIVE, FINE, MOIST	%		
	12					
	13		SANDY CLAY, MOTTLED LT. BRWN., ORANGE, GREY, MED STIFF, MED. PLAST., MOIST	%		
	14			4/4 %		
	15			%		
	16					
	17		SAA, SAND LENSES THROUGHOUT	%		
	18			4/4 %		
	19			%		
	20					
	21		SAA	4/4 %		
	22		CLAYEY SAND, MOTTLED LT. BRWN., ORANGE & GREY, MED. TO COARSE, COHESIVE, WET	%		
	23					
	24			%		

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT33

SHEET 3 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	25		SANDY SILT, LT. BROWN, SOFT, LOW PLAST., WET	4/4 %		
	26					
	27		SILTY SAND W/ CLAY, LT. BROWN TO GREY, MED. TO COARSE, COHESIVE, WET	%		
	28		SILTY CLAY W/ SAND	2/2 %		
	29		SANDY SILT W/ CLAY, LT. BROWN TO GREY, SOFT, LOW PLAST., WET			
	30					
	31		SAA, SAND LENSE @ ~ 31'	2/2 %		
	32					
	33		SILTY SAND, LT. BROWN, MED TO COARSE, COHESIVE, WET	2/2 %		
	34					
	35		SANDY SILT, LT. BROWN TO GREY, SOFT, WET, LOW PLAST.	2/2 %		
	36		SILTY SAND, LT. BROWN TO GREY, MED. TO COARSE, COHESIVE, WET	%		
	37		SAA, INCREASING SILT	2/2 %		
	38					
	39			%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

01077080

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824PPT33

SHEET 4 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
			SAA	2/2 %		
	40		CLAYEY SILT, DARK BROWN, SOFT, WET, LOW PLAST.,			
	41		CLAY, BROWN, STIFF, HIGH PLAST., MOIST	2/2 %		SET WELL 32'-42' BGS
	42			%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

01077081

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.	2. DIVISION	3. INSTALLATION LHAAP	SHEET 1 OF 4 SHEETS
4. PROJECT LHAAP 18/24		13. SIZE AND TYPE OF BIT 2 1/4" DIAMETER	
5. LOCATION (Coordinates or Station) Karnack, TX		14. DATUM FOR ELEVATION SHOWN (TBM or MSL) —	
6. DRILLING AGENCY WHE		15. MANUFACTURERS DESIGNATION OF DRILL GEOPROBE 7822DT	
7. HOLE NUMBER (as shown on drawing title and title number) 1824DPT34		16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN a. DISTURBED — b. UNDISTURBED —	
8. NAME OF DRILLER Kerri Powell		17. TOTAL NUMBER CORE BOXES —	
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.		18. ELEVATION GROUND WATER —	
10. THICKNESS OF OVERBURDEN —		19. DATE HOLE (YYYYMMDD) a. STARTED 06/08/21 b. COMPLETED 06/08/21	
11. DEPTH DRILLED INTO ROCK —		20. ELEVATION TOP OF HOLE (feet) —	
12. TOTAL DEPTH OF HOLE 42' BGS		21. TOTAL CORE RECOVERY FOR BORING % —	
		22. SIGNATURE OF INSPECTOR John Mowrer	

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	1		SILTY CLAY W/SAND, DARK BROWN, MED. PLAST, MED. STIFF, WET	2/4 %		
	2		CLAYEY SILT W/ SAND, LT. BROWN, SOFT, LOW PLAST., WET	%		
	3			%		
	4		SAA	%		
	5		CLAY, MOTLED REDDISH BROWN & GREY, STIFF, HIGH PLAST., MOIST	2/4 %		
	6			%		
	7			%		
	8			%		
	9			%		

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent) PROJECT HOLE NUMBER

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT34

SHEET 2 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	10		SAA, TRACE SAND	3/4		
	11					
	12		SAND LENSE, FINE TO MED, GREY, DRY			
	13		CLAY W/ TRACE SAND, MOTTLED ORANGE, BROWN, DARK GREY, MED. STIFF, HIGH PLAST., MOIST	4/4		
	14					
	15					
	16		SANDY CLAY, MOTTLED ORANGE, BROWN, GREY, STIFF, MED. PLAST., MOIST	4/4		
	17					
	18					
	19					
	20		SAA, INCREASING SAND	3/4		
	21					
	22		CLAYEY SAND, LT. BROWN TO ORANGE, FINE, COHESIVE, MOIST			
	23					
	24					

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER 1824DPT34

SHEET 3 OF 4 SHEETS

3. PROJECT LHAAP 18/24

4. INSTALLATION LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	25		SAA	4/4 %		
	26		SILT W/ TRACE SAND, LT. BROWN, LOW PLAST., SOFT, WET	%		
	27			%		
	28					
	29		SILTY SAND, LT. BROWN TO ORANGE, MED. TO COARSE GRAIN, WET	2/2 %		
	30					
	31		SANDY CLAY, MOTTLED LT. BROWN & GREY, MED. STIFF, MED. PLAST., MOIST TO WET	2/2 %		
	32					
	33		CLAYEY SILT W/ TRACE SAND, SOFT, MED TO HIGH PLAST, LT. BROWN, MOIST	2/2 %		
	34					
	35		SILTY SAND, LT. BROWN TO GREY, MED. GRAIN, COHESIVE, WET	2/2 %		
	36			%		
	37		SILTY CLAY W/ SAND, LT. BROWN TO GREY, MED. STIFF, MED. PLAST., WET	2/2 %		
	38					
	39			%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT34

SHEET 4 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
			SILTY SAND, LT. BROWN, MED. TO COARSE, COHESIVE, WET	2/2 %		
		40				
			SAA			
		41		2/2 %		SET WELL
			CLAY, LT. BROWN, STIFF, HIGH PLAST., WET			32'-42' BGS
		42				
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

01077085

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.	2. DIVISION	3. INSTALLATION LHAAP	SHEET 1 OF 4 SHEETS
4. PROJECT LHAAP 18/24		13. SIZE AND TYPE OF BIT 2 ¼" DIAMETER	
5. LOCATION (Coordinates or Station) LHAAP		14. DATUM FOR ELEVATION SHOWN (TBM or MSL) —	
6. DRILLING AGENCY WHE		15. MANUFACTURERS DESIGNATION OF DRILL GEOPROBE 7822DT	
7. HOLE NUMBER (as shown on drawing title and title number) 1824DPT35		16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN a. DISTURBED — b. UNDISTURBED —	
8. NAME OF DRILLER KERRI POWELL		17. TOTAL NUMBER CORE BOXES —	
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.		18. ELEVATION GROUND WATER —	
10. THICKNESS OF OVERBURDEN —		19. DATE HOLE (YYYYMMDD) a. STARTED 06/08/21 b. COMPLETED 06/08/21	
11. DEPTH DRILLED INTO ROCK —		20. ELEVATION TOP OF HOLE (feet) —	
12. TOTAL DEPTH OF HOLE 42' BGS		21. TOTAL CORE RECOVERY FOR BORING % —	
		22. SIGNATURE OF INSPECTOR John Moore	

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	SANDY SILT, DARK BROWN, SOFT, WET	2/4 %		
		2	SANDY CLAY, DARK BROWN TO DARK GREY, STIFF, HIGH PLAST., MOIST	%		
		3		%		
		4	SAA	%		
		5	CLAYEY SAND, LT. BROWN, COHESIVE, FINE, DRY TO MOIST	3/4 %		
		6		%		
		7		%		
		8		%		
		9		%		

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

PROJECT HOLE NUMBER

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT35

SHEET 2 OF 4 SHEETS

3. PROJECT: LHAAP · 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		10	SANDY CLAY, MOTTLED, LT. BROWN, GREY, ORANGE, STIFF, LOW PLAST., MOIST	3.75/4 = %		
		11				
		12				
		13	SAA	2.75/4 = %		
		14				
		15	CLAY W/ TRACE SAND, LT. BROWN TO ORANGE, MED. STIFF, HIGH PLAST., MOIST			
		16				
		17	CLAYEY SAND, LT. BROWN, COHESIVE, FINE TO MED., MOIST	2.5/4 = %		
		18				
		19				
		20				
		21	SILTY SAND W/ CLAY, LT. BROWN TO GREY, COHESIVE, SOFT, WET	4/4 = %		
		22				
		23				
		24				

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG (Sheet 1 of 2 Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is OCE/MCE

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT35

SHEET 3 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	6. DEPTH	7. LEGEND	8. CLASSIFICATION OF MATERIALS (Description)	9. % CORE RECOVERY	10. BOX OR SAMPLE NUMBER	11. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		25	CLAYEY SILT W/ SAND, ORANGE TO GREY, SOFT, LOW PLAST, MOIST TO WET	4/4 %		
		26				
		27		%		
		28	SILTY CLAY, LT. BROWN TO ORANGE, MED. STIFF, HIGH PLAST, MOIST	2/2 %		
		29				
		30	SAA	2/2 %		
		31				
		32	SAA	2/2 %		
		33				
		34	SAA	2/2 %		
		35				
		36	~~SILTY CLAY~~ INCREASING SILT CLAYEY SILT W/ TRACE SAND, LT. BROWN TO GREY, SOFT, MOIST, MED PLAST.	2/2 %		
		37				
		38		%		
		39				

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT35

SHEET 4 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		40	SAA	2/2 %		
		41	CLAY, LT. BROWN TO GREY, MED. STIFF, HIGH PLAST., MOIST	2/2 %		
		42		%		
		43		%		
		44		%		
		45		%		
		46		%		
		47		%		
		48		%		
		49		%		
		50		%		
				%		
				%		
				%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

01077089

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG	2. DIVISION	3. INSTALLATION LHAAP	SHEET 1 OF 3 SHEETS

4. PROJECT LHAAP 18/24	13. SIZE AND TYPE OF BIT 2 ¼" DIAMETER
5. LOCATION (Coordinates or Station) LHAAP	14. DATUM FOR ELEVATION SHOWN (TBM or MSL)
6. DRILLING AGENCY WHE	15. MANUFACTURERS DESIGNATION OF DRILL GEOPROBE 7822DT
7. HOLE NUMBER (as shown on drawing title and title number) 1824DPT36	16. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: a. DISTURBED —; b. UNDISTURBED —
8. NAME OF DRILLER KERRI POWELL	17. TOTAL NUMBER CORE BOXES —
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.	18. ELEVATION GROUND WATER —
10. THICKNESS OF OVERBURDEN —	19. DATE HOLE (YYYYMMDD): a. STARTED 06/08/21; b. COMPLETED 06/08/21
11. DEPTH DRILLED INTO ROCK —	20. ELEVATION TOP OF HOLE (feet) —
12. TOTAL DEPTH OF HOLE 36' BGS	21. TOTAL CORE RECOVERY FOR BORING % —
	22. SIGNATURE OF INSPECTOR Rob Moore

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	1		CLAYEY SILT W/ SAND, DARK BROWN, LOOSE, WET	2.5/4 %		
	2		SANDY CLAY, MOTLED RED, LT. BROWN, ORANGE, MED. STIFF, HIGH PLAST., MOIST	%		
	3			%		
	4					
	5		SAA	4/4 %		
	6			%		
	7		SLAYEY SAND, LT. BROWN TO ORANGE SOFT, LOW PLAST., MOIST	%		
	8					
	9			%		

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: ~~LHAAP~~ 1824DPT36

SHEET 2 OF 3 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		10	SILTY CLAY W/ SAND, MED. STIFF, MOTTLED LT. BROWN, GREY,	% 4/4 %		
		11	ORANGE, MED. STIFF TO SOFT, LOW PLAST., MOIST			
		12	SILTY SAND W/ CLAY, MOTTLED LT.	%		
		13	BROWN, GREY, ORANGE, MED. STIFF, ~~LOW~~	~~4~~ %		
		14	~~PLAST.~~, COHESIVE, FINE TO MED.	3.75/4 %		
		15	MOIST			
		16	CLAYEY SAND, LT.	%		
		17	BROWN TO ORANGISH BROWN, MED. TO	4/4 %		
		18	COARSE, COHESIVE, MOIST TO WET			
		19		%		
		20	SANDY SILT, LT.			
		21	BROWN TO GREY,	% 3.75/4 %		
		22	SOFT, LOW PLAST., MOIST TO WET			
		23				
		24		%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT36

SHEET 3 OF 3 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	25		SAA, TRACE CLAY	4/4 %		
	26					
	27			%		
	28		SANDY SILT W/ CLAY, LT. BROWN TO GREY, SOFT, LOW PLAST., FINE GRAIN, WET	2/2 %		
	29					
	30		SAA, INCREASING CLAY	2/2 %		
	31					
	32		SAA	2/2 %		
	33					
	34		CLAY, LT. BROWN TO GREY, MED. STIFF, HIGH PLAST, MOIST	2/2 %		SET WELL SCREEN 26'-36' BGS
	35					
	36			%		
				%		
				%		

ENG FORM 1836A, JUN 1987 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NO. (As shown)

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804, the proponent agency is CECW-EG	2. DIVISION	3. INSTALLATION LHAAP	SHEET 1 OF 4 SHEETS
4. PROJECT LHAAP		13. SIZE AND TYPE OF BIT 2 ¼" DIAMETER	
5. LOCATION (Coordinates or Station) KARNACK, TX		14. DATUM FOR ELEVATION SHOWN (TBM or MSL) —	
6. DRILLING AGENCY WHE		15. MANUFACTURERS DESIGNATION OF DRILL GEOPROBE 7822DT	
7. HOLE NUMBER (as shown on drawing title and title number) 1824DPT37		16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED — b. UNDISTURBED —	
8. NAME OF DRILLER KERRI POWELL		17. TOTAL NUMBER CORE BOXES —	
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.		18. ELEVATION GROUND WATER —	
10. THICKNESS OF OVERBURDEN —		19. DATE HOLE (YYYYMMDD): a. STARTED 06/10/21 b. COMPLETED 6/10/21	
11. DEPTH DRILLED INTO ROCK —		20. ELEVATION TOP OF HOLE (feet) —	
12. TOTAL DEPTH OF HOLE 44' BGS		21. TOTAL CORE RECOVERY FOR BORING % —	
		22. SIGNATURE OF INSPECTOR [signature]	

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	SILTY CLAY, REDDISH BRWN. TO DARK BRWN, SOFT, LOW PLAST., WET	2/4		
		2				
		3				
		4	CLAY, REDDISH BRWN., STIFF, HIGH PLAST., MOIST.	2.25/4		
		5				
		6				
		7				
		8				
		9				

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE	2. HOLE NUMBER	SHEET 2 OF 4 SHEETS
	1824DPT37	

3. PROJECT	4. INSTALLATION
LHAAP 18/24	LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	10		SAA W/ SAND	4/4		
	11					
	12					
	13		SAA			
	14			4/4		
	15		CLAYEY SAND, BROWN TO ORANGE MED TO COARSE, COHESIVE, MOIST			
	16					
	17		SAA	3.5/4		
	18					
	19					
	20					
	21		SAA	4/4		
	22		SANDY CLAY, MOTTLED LT. BROWN, ORANGE, GREY, MED. STIFF, LOW PLAST., DRY TO MOIST			
	23					
	24					

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT37

SHEET 3 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	25		SILTY SAND, ORANGE, FINE, COHESIVE, WET	4/4 %		
	26					
	37		CLAYEY SAND, MED. TO COARSE, LT. BROWN, WET	%		
	28		CLAYEY SILT, LT. BROWN TO GREY, SOFT, LOW PLAST., WET	2/2 %		
	29			~~1.75~~ 0/4 %		
	30		SAA	2/2 %		
	31					
	32		SAA	2/2 %		
	33					
	34		SILTY SAND, LT. BROWN TO GREY, MED GRAIN, COHESIVE, WET	1.25/2 %		
	35					
	36		SAA	1.75/2 %		
	37		CLAYEY SAND, LT. BROWN, MED, COHESIVE, WET			
	38		SAA	1.5/2 %		
	39					

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT37

SHEET 4 OF 4 SHEETS

PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	40			%		
	41		SILTY CLAY, LT. BROWN, GREY, ORANGE, SOFT, MED PLAST, MOIST	2/2 %		
	42		CLAY, LT. BROWN TO GREY, STIFF, HIGH PLAST, MOIST TO WET	2/2 %		SET WELL 34'-44' BGS
	43					
	44			%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

01077096

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.	2. DIVISION	3. INSTALLATION LHAAP	SHEET 1 OF 43 SHEETS
4. PROJECT LHAAP 18/24		13. SIZE AND TYPE OF BIT 2 1/4" DIAMETER	
5. LOCATION (Coordinates or Station) LHAAP		14. DATUM FOR ELEVATION SHOWN (TBM or MSL) —	
		15. MANUFACTURERS DESIGNATION OF DRILL GEOPROBE 7822DT	
6. DRILLING AGENCY WHE		16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN	a. DISTURBED ~ b. UNDISTURBED ~
7. HOLE NUMBER (as shown on drawing title and title number) 1824DPT38		17. TOTAL NUMBER CORE BOXES ←	
8. NAME OF DRILLER KERRI POWELL		18. ELEVATION GROUND WATER —	
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.		19. DATE HOLE (YYYYMMDD)	a. STARTED 06/08/21 b. COMPLETED 06/08/21
10. THICKNESS OF OVERBURDEN ←		20. ELEVATION TOP OF HOLE (feet) —	
11. DEPTH DRILLED INTO ROCK ←		21. TOTAL CORE RECOVERY FOR BORING % —	
12. TOTAL DEPTH OF HOLE 38' BGS		22. SIGNATURE OF INSPECTOR JL Moore	

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	SILTY CLAY W/ SAND, DARK BROWN, SOFT, LOW PLAST., WET	2/4 %		
		2				
		3		%		
		4				
		5	SANDY CLAY, DARK BROWN TO LT. BROWN, MED. STIFF, LOW PLAST., MOIST	2/4 %		
		6				
		7		%		
		8				
		9		%		

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent) PROJECT HOLE NUMBER

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER ~~LHAAP-1~~ 1824DP138

SHEET 2 OF 3 ~~4~~ SHEETS

3. PROJECT LHAAP 18/24

4. INSTALLATION LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	10		CLAYEY SAND, LT. BROWN, FINE GRAIN, COHESIVE, MOIST	2.75/4 %		
	11			%		
	12		~~SAA~~/SM SANDY CLAY, MOTTLED LT. BROWN & GREY, LOW PLAST., MOIST	%		
	13			3/4 %		
	14			%		
	15			%		
	16		SAA	%		
	17		CLAYEY SAND, LT. BROWN TO ORANGE, FINE GRAIN, COHESIVE, WET	4/4 %		
	18			%		
	19			%		
	20		SAA	%		
	21		SANDY CLAY, LT. BROWN TO GREY, STIFF, LOW PLAST., MOIST	4/4 %		
	22			%		
	23			%		
	24					

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT38

SHEET 3 OF 4 SHEETS

PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	25		SAA	4/4 %		
	26			%		
	27			%		
	28		SILTY SAND W/ CLAY, LT. BROWN TO ORANGE, MED. TO COARSE, COHESIVE, WET	2/2 %		
	29					
	30		SAA	2/2 %		
	31					
	32		SAA, INCREASING CLAY @ BOTTOM	2/2 %		
	33					
	34		SANDY CLAY, LT. BROWN TO GREY, SOFT, HIGH PLAST., WET	2/2 %		
	35					
	36		CLAY, ORANGE TO DARK GREY, STIFF, HIGH PLAST., MOIST	2/2 %		SET WELL 28'-38' BGS
	37					
	38			%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

01077099

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804, the proponent agency is CECW-EG	2. DIVISION	3. INSTALLATION LHAAP	SHEET 1 OF 4 SHEETS
4. PROJECT LHAAP 18/24		13. SIZE AND TYPE OF BIT 2 ¼" DIAMETER	
5. LOCATION (Coordinates or Station) LHAAP		14. DATUM FOR ELEVATION SHOWN (TBM or MSL) —	
		15. MANUFACTURERS DESIGNATION OF DRILL GEOPROBE 7822DT	
6. DRILLING AGENCY WHE		16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN a. DISTURBED — b. UNDISTURBED —	
7. HOLE NUMBER (as shown on drawing title and title number) 1824DPT39		17. TOTAL NUMBER CORE BOXES —	
8. NAME OF DRILLER KERRI POWELL		18. ELEVATION GROUND WATER —	
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.		19. DATE HOLE (YYYYMMDD) a. STARTED 06/09/21 b. COMPLETED 06/09/21	
10. THICKNESS OF OVERBURDEN —		20. ELEVATION TOP OF HOLE (feet) —	
11. DEPTH DRILLED INTO ROCK —		21. TOTAL CORE RECOVERY FOR BORING % —	
12. TOTAL DEPTH OF HOLE 40' BGS		22. SIGNATURE OF INSPECTOR JL Moore	

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	~~SILTY~~ CLAYEY SILT, DARK BRWN., SOFT, LOW PLAST., WET	1.75/4 = %		
		2	SILTY CLAY W/ TRACE SAND, RED, MED. STIFF, MED. PLAST., MOIST	%		
		3				
		4	SAA, REDDISH BRWN. TO LT. BRWN.,	4/4 = %		
		5				
		6				
		7	CLAYEY SAND, LT. BROWN, COHESIVE, FINE GRAIN, MOIST	%		
		8				
		9		%		

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent) PROJECT HOLE NUMBER

DRILLING LOG (Construction Drilling) For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DFT39

SHEET 2 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	8. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		10	SILTY SAND W/ CLAY, LT. BROWN, FINE, COHESIVE, MOIST TO WET	3.5/4 = %		
		11	SANDY SILT W/ CLAY, LT. BROWN, MED. PLAST, SOFT, WET	%		
		12	SANDY CLAY, GREY TO REDDISH BRWN., MED. STIFF, LOW PLAST., MOIST	%		
		13		4/4 = %		
		14				
		15	CLAYEY SAND, REDDISH BROWN, FINE, COHESIVE, MOIST	%		
		16	SAA, MOTTLED REDDISH BRWN. & LT. GREY.	%		
		17		4/4 = %		
		18				
		19		%		
		20	SILTY SAND W/ CLAY, LT. BROWN TO GREY, MED. GRAIN, COHESIVE, MOIST TO WET	%		
		21		3.75/4 = %		
		22				
		23		%		
		24				

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG

3. PROJECT: LHAAP 18/24	4. ELEVATION TOP OF HOLE	5. HOLE NUMBER: 1824DPT39	3 of 4
		6. INSTALLATION: LHAAP	

8. ELEVATION	9. DEPTH	10. LEGEND	11. CLASSIFICATION OF MATERIALS (Description)	12. CORE RECOVERY	13. BOX OR SAMPLE NUMBER	14. REMARKS
		25	SANDY SILT, MOTLED LT. BROWN & GREY, SOFT, LOW PLAST., MOIST TO WET	3.5/4		
		26	CLAYEY SAND, LT. BROWN TO GREY, FINE TO MED., COHESIVE, WET			
		27				
		28				
		29	SAA, INCREASING GRAIN SIZE	2/2		
		30				
		31	SANDY SILT W/ CLAY, LT. BROWN TO GREY, MED. STIFF, MED PLAST., WET	2/2		
		32				
		33	SAA	2/2		
		34				
		35	SAA, INCREASING CLAY	2/2		
		36				
		37	SANDY CLAY, GREY TO ORANGISH BROWN, MED. STIFF, MED. PLAST., MOIST	2/2		
		38				
		39				

DRILLING LOG (Continuation Sheet) For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.	1. ELEVATION TOP OF HOLE	2. HOLE NUMBER 1824DPT39	SHEET 4 OF 4 SHEETS
3. PROJECT LHAAP 18/24		4. INSTALLATION LHAAP	

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		40	CLAY, LT. BROWN TO GREY, STIFF, HIGH PLAST., MOIST	2/2 %		SET WELL 30'-40' BGS
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT	7. HOLE NUMBER

01077103

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.	2. DIVISION	3. INSTALLATION LHAAP	SHEET 1 OF 4 SHEETS
4. PROJECT LHAAP 18/24		13. SIZE AND TYPE OF BIT 2¼" DIAMETER	
5. LOCATION (Coordinates or Station) LHAAP		14. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
		15. MANUFACTURERS DESIGNATION OF DRILL GEOPROBE 7822DT	
6. DRILLING AGENCY WHE		16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN	a. DISTURBED — b. UNDISTURBED —
7. HOLE NUMBER (as shown on drawing title and title number) 1824DPT40		17. TOTAL NUMBER CORE BOXES —	
8. NAME OF DRILLER KERRI POWELL		18. ELEVATION GROUND WATER ✓	
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.		19. DATE HOLE (YYYYMMDD)	a. STARTED 06/09/21 b. COMPLETED 06/09/21
10. THICKNESS OF OVERBURDEN —		20. ELEVATION TOP OF HOLE (feet) —	
11. DEPTH DRILLED INTO ROCK —		21. TOTAL CORE RECOVERY FOR BORING % —	
12. TOTAL DEPTH OF HOLE ~~38' BGS~~ 41' BGS		22. SIGNATURE OF INSPECTOR Jake Moore	

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	CLAYEY SILT, DARK BRWN., SOFT, MED. PLAST., WET	1.25 / 4 = %		
		2–3	CLAY W/ TRACE SAND, MOTTLED LT. BROWN & RED, STIFF, HIGH PLAST., MOIST	%		
		4–6	SAA, MOTTLED LT. BROWN & GREY, INCREASED SAND @ BOTTOM	4 / 4 = %		
		7–9		%		

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent) PROJECT HOLE NUMBER

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT40

SHEET 2 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		10	SAA	4/4 %		
		11	CLAYEY SAND, MOTTLED LT. BROWN & GREY, FINE GRAIN, COHESIVE, MOIST	%		
		12	SAA	%		
		13	SANDY CLAY, MOTLED REDDISH BRWN. & GREY, STIFF, HIGH TO MED PLAST., MOIST TO WET	4/4 %		
		14		%		
		15		%		
		16	SAA	%		
		17		4/4 %		
		18	CLAYEY SAND, ORANGISH BROWN, FINE TO MED, COHESIVE, MOIST	%		
		19	SANDY CLAY, LT. BROWN, MED. STIFF, LOW PLAST., MOIST	%		
		20	CLAYEY SAND, LT. BRWN. TO ORANGISH BRWN., MED TO COARSE, COHESIVE, WET	2.75/4 %		
		21		%		
		22		%		
		23		%		
		24		%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

1824DPT40

3
4

LHAAP 18/24

LHAAP

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NUMBER	BLOW COUNTS (N VALUE)
	25		SAA, INCREASING CLAY / SILT	4/4		
	26					
	27					
	28		CLAY, LT. BROWN TO GREY, STIFF, HIGH PLAST., MOIST	2/2		
	29		SANDY SILT, MOTTLED ORANGE & GREY, SOFT, LOW PLAST., WET			
	30		SAA	2/2		
	31		SILTY SAND W/ CLAY, LT. BROWN, FINE TO MED., COHESIVE, WET			
	32		SAA	2/2		
	33					
	34		SAA, INCREASING CLAY	2/2		
	35					
	36		SANDY CLAY W/ SILT, SOFT, LT. BROWN TO GREY, LOW PLAST., WET	2/2		
	37					
	38					
	39					

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT40

SHEET 4 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR, SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
			SAA, DECREASING SAND	2/2 %		
	40		CLAY, DARK BROWN TO GREY, STIFF, HIGH PLAST, MOIST	1/1 %		SEE WELL SCREEN 31'-41' BGS
	41			%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

01077107

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.	2. DIVISION	3. INSTALLATION LHAAP	SHEET 1 OF 3 SHEETS
4. PROJECT LHAAP 18/24		13. SIZE AND TYPE OF BIT 2 ¼" DIAMETER	
5. LOCATION (Coordinates or Station) KARNACK, TX		14. DATUM FOR ELEVATION SHOWN (TBM or MSL) —	
		15. MANUFACTURERS DESIGNATION OF DRILL GEOPROBE 7822DT	
6. DRILLING AGENCY WHE		16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN a. DISTURBED — b. UNDISTURBED —	
7. HOLE NUMBER (as shown on drawing title and title number) 1824DPT41		17. TOTAL NUMBER CORE BOXES —	
		18. ELEVATION GROUND WATER —	
8. NAME OF DRILLER KERRI POWELL		19. DATE HOLE (YYYYMMDD) a. STARTED 06/09/21 b. COMPLETED 06/09/21	
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.		20. ELEVATION TOP OF HOLE (feet) —	
10. THICKNESS OF OVERBURDEN —		21. TOTAL CORE RECOVERY FOR BORING % —	
11. DEPTH DRILLED INTO ROCK —		22. SIGNATURE OF INSPECTOR [signature]	
12. TOTAL DEPTH OF HOLE 38' BGS			

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	SILTY CLAY, DARK BROWN TO REDDISH BROWN, STIFF, LOW PLAST., DRY TO MOIST	2/4 %		
		2		%		
		3		%		
		4				
		5	SAA, LT. BROWN, MOIST	2.75 %		
		6	SANDY SILT W/ CLAY, LT. BROWN TO GREY, SOFT, LOW PLAST., WET	4 %		
		7				
		8		%		
		9	CLAY, MOTTLED LT. BROWN & GREY, MED. STIFF, HIGH PLAST. MOIST	3/4 %		

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE	2. HOLE NUMBER	SHEET
	1824DPT41	2 OF 3 SHEETS

3. PROJECT	4. INSTALLATION
LHAAP 18/24	LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	10		SANDY CLAY w/ SILT, LT. BROWN TO GREY, MED. STIFF, LOW PLAST., MOIST	%		
	11			%		
	12		SAA	%		
	13		CLAYEY SAND, LT. BROWN TO ORANGISH BROWN, COHESIVE, MOIST, MED GRAIN	1.5/4		
	14			%		
	15			%		
	16		SAA, INCREASING GRAIN SIZE, WET	%		
	17			3/4		
	18			%		
	19			%		
	20		SAA	%		
	21		SANDY SILT w/ CLAY, LT BROWN TO GREY, SOFT, LOW PLAST., WET	4/4		
	22			%		
	23		SILTY SAND, FINE TO MED, LT. BROWN, WET	%		
	24					

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT41

SHEET 3 OF 3 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		25	CLAYEY SILT W/ SAND, LT. BROWN, SOFT, LOW PLAST., WET	4/4 %		
		26		%		
		27		%		
		28	SAA, INCREASING SAND	2/2 %		
		29				
		30	SAA	2/2 %		
		31	SILTY SAND W/ CLAY, LT. BROWN, SOFT, WET, LOW PLAST, FINE	%		
		32	SILTY CLAY, LT. BROWN, SOFT, MED TO HIGH PLAST., WET	2/2 %		
		33	SILTY SAND, LT BROWN, FINE TO MED., WET, COHESIVE			
		34	SILTY CLAY, LT. BROWN, MED. STIFF, MED. PLAST., WET	2/2 %		
		35				
		36	CLAY, LT. BROWN TO GREY, STIFF, HIGH PLAST., MOIST	2/2 %		SET WELL 28'-38' BGS
		37				
		38		%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

01077110

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.	2. DIVISION	3. INSTALLATION LHAAP	SHEET 1 OF 3 SHEETS
4. PROJECT LHAAP 18/24		13. SIZE AND TYPE OF BIT 2 ¼" DIAMETER	
5. LOCATION *(Coordinates or Station)* KARNACK, TX		14. DATUM FOR ELEVATION SHOWN *(TBM or MSL)* —	
6. DRILLING AGENCY WHE		15. MANUFACTURERS DESIGNATION OF DRILL GEOPROBE 7822DT	
7. HOLE NUMBER *(as shown on drawing title and title number)* 1824DPT42		16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN a. DISTURBED — b. UNDISTURBED —	
8. NAME OF DRILLER KERRI POWELL		17. TOTAL NUMBER CORE BOXES —	
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.		18. ELEVATION GROUND WATER —	
10. THICKNESS OF OVERBURDEN —		19. DATE HOLE *(YYYYMMDD)* a. STARTED 06/09/21 b. COMPLETED 06/09/21	
11. DEPTH DRILLED INTO ROCK —		20. ELEVATION TOP OF HOLE *(feet)* —	
12. TOTAL DEPTH OF HOLE 34' BGS		21. TOTAL CORE RECOVERY FOR BORING % —	
		22. SIGNATURE OF INSPECTOR JL Moore	

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	1		SILTY CLAY W/ SAND, RED, MED. STIFF, MED. PLAST., MOIST	1.75/4 %		
	2					
	3			%		
	4					
	5		SAA	2/4 %		
	6		SANDY SILT, DARK BROWN, SOFT, LOW PLAST., WET			
	7			%		
	8					
	9			%		

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT42

SHEET 2 OF 3 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
			SAA	%		
	10		SANDY CLAY, DARK BROWN, SOFT, WET,	2.75/4		
	11		LOW PLAST.	%		
			PLAYEY SAND, DARK BROWN, FINE TO MED., WET, COHESIVE			
	12		SILTY SAND, LT. BROWN TO GREY, LOOSE,	%		VERY WET, SULFUR-LIKE SMELL COMING FROM CORE
	13		WET, MED. TO COARSE	3/4		
	14			%		
	15			%		
	16					
	17		SAA	%		
	18			3/4		
	19			%		
	20			%		
	21		SAA, INCREASING CLAY / SILT	%		
	22			4/4		
	23		SILTY CLAY W/ SAND, LT. BROWN TO GREY, WET, SOFT, LOW PLAST.	%		
	24			%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG — 3

1224DRT42 — 3

LHAAP 12/24 — LHAAP

DEPTH IN FEET	LEGEND	DESCRIPTION OF MATERIALS	% CORE RECOVERY	SAMPLE NUMBER	REMARKS
25		SAA	4/4		
26					
27					
28					
29		SAA	2/2		
30					
31		CLAY, DARK BROWN TO GREY, STIFF, HIGH PLAST., MOIST	2/2		
32					
33		SAA	2/2		DRILLED TOO FAR INTO CLAY, PULL OUT OF HOLE & MOVE 3' NE & SET WELL 21'-31' BGS
34					
35					
36					
37					
38					
39					

ENG FORM 1836A, JUN 1967 — PREVIOUS EDITIONS ARE OBSOLETE. (Translucent) — 6. PROJECT — 7. HOLE NUMBER

01077113

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG	2. DIVISION	3. INSTALLATION LHAAP	SHEET 1 OF 3 SHEETS

4. PROJECT LHAAP 18/24	13. SIZE AND TYPE OF BIT 6"
5. LOCATION (Coordinates or Station) KARNACK, TX	14. DATUM FOR ELEVATION SHOWN (TBM or MSL) —
6. DRILLING AGENCY WHE	15. MANUFACTURERS DESIGNATION OF DRILL GEOPROBE 8150 LS
7. HOLE NUMBER (as shown on drawing title and title number) 1824DPTMW1	16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED —; b. UNDISTURBED —
8. NAME OF DRILLER COLBY POUNDS	17. TOTAL NUMBER CORE BOXES —
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.	18. ELEVATION GROUND WATER —
10. THICKNESS OF OVERBURDEN —	19. DATE HOLE (YYYYMMDD): a. STARTED 06/18/2021; b. COMPLETED 06/21/2021
11. DEPTH DRILLED INTO ROCK —	20. ELEVATION TOP OF HOLE (feet) —
12. TOTAL DEPTH OF HOLE 35' BGS	21. TOTAL CORE RECOVERY FOR BORING % —
	22. SIGNATURE OF INSPECTOR JH Moore

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	SILTY CLAY, REDDISH BROWN, MED. STIFF, MED. PLAST., WET	%		
		2		%		
		3		2.5/10		
		4		%		
		5		%		
		6		%		
		7		%		
		8		%		
		9		%		

DRILLING LOG (Continuation Sheet) For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.	1. ELEVATION TOP OF HOLE	2. HOLE NUMBER 1824DPTMW1	SHEET 2 OF 3 SHEETS
3. PROJECT LHAAP 18/24		4. INSTALLATION LHAAP	

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		10		%		
			SAA, SOME SAND			
		11		%		
		12		%		
		13	CLAYEY SAND, ORANGE; FINE TO MED., MOIST, COHESIVE			
		14		10		
			SILTY SAND, LT. BROWN TO GREY, MED TO COARSE, COHESIVE, WET			
		15		10		
		16		%		
		17		%		
		18		%		
		19		%		
		20		%		
			SANDY SILT; LT. BROWN, SOFT, WET, LOW PLAST.			
		21		%		
		22		10		
				10		
		23		%		
		24		%		

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 824DPTMW1

SHEET 3 OF ~~4~~ 3 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		25		%		
		26		%		
		27		%		
		28		%		
		29	SILTY CLAY, SOFT TO MED., ORANGISH BROWN, MED. PLAST., WET	%		
		30	SAA	%		
		31	CLAY, LT. BROWN TO GREY, MED. STIFF, HIGH PLAST., MOIST	%		HIT CLAY @ 30.5' BGS, SET WELL SCREEN 22'-32' BGS
		32		%		
		33		5/5 %		
		34		%		
		35		%		
		36		%		
		37		%		
		38		%		
		39		%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.	2. DIVISION	3. INSTALLATION LHAAP	SHEET 1 OF 4 SHEETS
4. PROJECT LHAAP 18/24		13. SIZE AND TYPE OF BIT 6"	
5. LOCATION (Coordinates or Station) ~~1824D~~ GM KARNACK TX		14. DATUM FOR ELEVATION SHOWN (TBM or MSL) —	
6. DRILLING AGENCY WHE		15. MANUFACTURERS DESIGNATION OF DRILL GEOPROBE 8150 LS	
7. HOLE NUMBER (as shown on drawing title and title number) 1824DPTMW2		16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN a. DISTURBED — b. UNDISTURBED —	
8. NAME OF DRILLER COLBY POUNDS		17. TOTAL NUMBER CORE BOXES —	
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.		18. ELEVATION GROUND WATER —	
10. THICKNESS OF OVERBURDEN —		19. DATE HOLE (YYYYMMDD) a. STARTED 06/16/2021 b. COMPLETED 06/16/2021	
11. DEPTH DRILLED INTO ROCK —		20. ELEVATION TOP OF HOLE (feet) —	
12. TOTAL DEPTH OF HOLE 40' BGS		21. TOTAL CORE RECOVERY FOR BORING % —	
		22. SIGNATURE OF INSPECTOR John Moore	

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	CLAYEY SILT W/SAND, BROWN, SOFT, WET, LOW PLAST.	%		
		2		%		
		3		3.5 / 10		
		4	CLAY, MOTTLED RED, GREY, LT. BROWN, STIFF, HIGH PLAST., MOIST	%		
		5		%		
		6		%		
		7		%		
		8		%		
		9		%		

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPTMW2

SHEET 2 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	10		SILTY CLAY, MOTLED RED & BROWN, SOFT, LOW PLAST, WET, TRACE SAND	%		
	11		SAA	%		
	12			%		
	13		SANDY CLAY, MOTTLED LT. BROWN, DARK BROWN & GREY, MED. STIFF, LOW PLAST, DRY TO MOIST, SAND LENSES THROUGHOUT	5/10		
	14			%		
	15			%		
	16			%		
	17			%		
	18			%		
	19			%		
	20			%		
	21			%		
	22			%		
	23			%		
	24			%		

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPTMW2

SHEET 3 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	25		SAA	%		
	26		CLAYEY SAND, LT. BROWN TO ORANGISH BROWN, FINE TO MED, DRY	5/10 %		
	27			%		
	28			%		
	29		CLAYEY SAND W/SILT, FINE TO MED., LT. BROWN TO GREY, COHESIVE, WET	%		
	30		CLAYEY SILT W/ SAND, LT. BROWN, SOFT, WET, LOW PLAST.	%		
	31			%		
	32			%		
	33			%		
	34			10/10 %		
	35			%		
	36			%		
	37			%		
	38			%		
	39		CLAY, ~~TAN~~ LT. BROWN TO ORANGISH BROWN, STIFF, HIGH PLAST., MOIST	%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

DRILLING LOG (Continuation Sheet) For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.	1. ELEVATION TOP OF HOLE	2. HOLE NUMBER 1824DPTMW2	SHEET 4 OF 4 SHEETS
3. PROJECT LHAAP 18/24		4. INSTALLATION LHAAP	

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		40		%		CLAY REACHED @ 38.5' BGS, SCR WELL SCREEN 30'-40' BGS
		41		%		
		42		%		
		43		%		
		44		%		
		45		%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		

01077120

1. HOLE NUMBER

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: LHAAP

SHEET 1 OF 4 SHEETS

4. PROJECT: LHAAP 18/24

5. LOCATION (Coordinates or Station): KARNACK, TX

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): 1824DPTMW3

8. NAME OF DRILLER: KERRI POWELL

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: 40' BGS

13. SIZE AND TYPE OF BIT: 6"

14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —

15. MANUFACTURERS DESIGNATION OF DRILL: GEOPROBE 8150 LS

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED —; b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER: —

19. DATE HOLE (YYYYMMDD): a. STARTED 06/16/2021; b. COMPLETED 06/17/2021

20. ELEVATION TOP OF HOLE (feet): —

21. TOTAL CORE RECOVERY FOR BORING %: —

22. SIGNATURE OF INSPECTOR: JL Moore

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	CLAYEY SILT, DARK BROWN, SOFT, WET, LOW PLAST., SOME SAND	%		
		2	SANDY CLAY, LT. BROWN, MED. STIFF, MED. PLAST., WET, SAND LENSES THROUGHOUT	%		
		3		%		
		4				
		5		10		
		6		10 %		
		7		%		
		8		%		
		9		%		

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

PROJECT

HOLE NUMBER

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPTMW3

SHEET 2 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	10		SAA	%		
	11		SILTY CLAY, LT. BROWN, MED. STIFF, MED. PLAST, MOIST, SAND LENSES THROUGHOUT	%		
	12			%		
	13					
	14			6/10 %		
	15			%		
	16					
	17		CLAYEY SAND, LT. BROWN TO GREY, FINE TO MED. COHESIVE, MOIST	%		
	18			%		
	19					
	20		SAA	%		
	21			%		
	22			%		
	23			%		
	24			%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPTMW3

SHEET 3 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	25			%		
	26		SILTY CLAY, LT. BROWN TO GREY, MED. STIFF, HIGH PLAST., WET	10/10 %		
	27					
	28			%		
	29			%		
	30			%		
	31		SILT, LT. BROWN TO GREY, SOFT, WET, LOW PLAST.	%		
	32			%		
	33			%		
	34			%		
	35			10/10 %		
	36			%		
	37			%		
	38			%		
	39		CLAY, LT. BROWN TO ORANGISH BROWN, STIFF, HIGH PLAST., MOIST	%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG (Continuation Sheet) For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.	1. ELEVATION TOP OF HOLE	2. HOLE NUMBER [824DPTMW3	SHEET 4 OF 4 SHEETS
3. PROJECT LHAAP 18/24		4. INSTALLATION LHAAP	

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		40		%		HIT CLAY @ 38.5' BGS, SET WELL SCREEN 30'-40' BGS
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		

01077124

1. HOLE NUMBER

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: LHAAP

SHEET 1 OF 4 SHEETS

4. PROJECT: LHAAP 18/24

5. LOCATION (Coordinates or Station): KARNACK, TX

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): 1824DPT MW4

8. NAME OF DRILLER: Colby Pounds

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: 40' BGS

13. SIZE AND TYPE OF BIT: 6"

14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —

15. MANUFACTURERS DESIGNATION OF DRILL: GEOPROBE 8150LS

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED ~ b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER: —

19. DATE HOLE (YYYYMMDD): a. STARTED 06/17/2021 b. COMPLETED

20. ELEVATION TOP OF HOLE (feet): —

21. TOTAL CORE RECOVERY FOR BORING %: —

22. SIGNATURE OF INSPECTOR: [signature]

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	SANDY/SILTY CLAY, LT. BROWN, SOFT, WET, LOW PLAST.	%		
		2		%		
		3	SANDY CLAY, MOTTLED LT. BROWN, RED & GREY, STIFF, MED. PLAST., MOIST	5/10 %		
		4				
		5		%		
		6		%		
		7		%		
		8		%		
		9		%		

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

PROJECT

HOLE NUMBER

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPT MW14

SHEET 2 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		10		%		
			CLAYEY SILT W/ SAND, LT. BROWN, SOFT, WET, LOW PLAST.			
		11		%		
		12				
			SANDY CLAY, LT. BROWN TO GREY, STIFF, LOW PLAST., DRY TO MOIST	%		
		13		7/10		
		14		%		
		15		%		
		16		%		
		17		%		
		18		%		
		19		%		
		20				
			SANDY SILT/ SILTY SAND, LT. BROWN, SOFT, WET, LOW PLAST., FINE GRAIN	%		
		21		%		
		22		%		
		23		8/10 %		
		24				

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE	2. HOLE NUMBER	SHEET 3 OF 4 SHEETS
	1824DPTMW4	

3. PROJECT	4. INSTALLATION
LHAAP 18/24	LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	25			%		
	26			%		
	27			%		
	28			%		
	29			%		
	30			%		
	31			%		
	32		SAA	%		
	33			10/10 %		
	34			%		
	35			%		
	36			%		
	37			%		
	38			%		
	39		CLAY, LT. BROWN TO ORANGE, STIFF, HIGH PLAST.	%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: 1824DPTMW4

SHEET 4 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		40	WET	%		CLAY REACHED @ 38.5' BGS. SEE WELL SCREEN 30'-40' BGS
		41		%		
		42		%		
		43		%		
		44		%		
		45		%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

01077128

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.	2. DIVISION	3. INSTALLATION LHAAP	SHEET 1 OF 4 SHEETS
4. PROJECT LHAAP 18/24		13. SIZE AND TYPE OF BIT 6"	
5. LOCATION (Coordinates or Station) KARNACK, TX		14. DATUM FOR ELEVATION SHOWN (TBM or MSL) —	
		15. MANUFACTURERS DESIGNATION OF DRILL GEOPROBE 8150 LS	
6. DRILLING AGENCY WHE		16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN a. DISTURBED —	b. UNDISTURBED —
7. HOLE NUMBER (as shown on drawing title and title number) MW-05		17. TOTAL NUMBER CORE BOXES —	
8. NAME OF DRILLER Colby Pounds		18. ELEVATION GROUND WATER —	
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.		19. DATE HOLE (YYYYMMDD) a. STARTED 06/15/2021	b. COMPLETED
10. THICKNESS OF OVERBURDEN —		20. ELEVATION TOP OF HOLE (feet) —	
11. DEPTH DRILLED INTO ROCK —		21. TOTAL CORE RECOVERY FOR BORING % —	
12. TOTAL DEPTH OF HOLE 40' BGS		22. SIGNATURE OF INSPECTOR John Mann	

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	CLAY, RED TO LT. BROWN, MED. STIFF, HIGH PLAST., MOIST	%		
		2		%		
		3		10		
		4		10 %		
		5		%		
		6		%		
		7		%		
		8		%		
		9		%		

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: MW-05

SHEET 2 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	10		~~SAND~~ SM	%		
	11		SAA	%		
	12			%		
	13		SANDY CLAY, LT. BROWN TO GREY, SOFT, MED. PLAST., MOIST	%		
	14			10/10		
	15			%		
	16			%		
	17		CLAYEY SAND W/ SILT, LT. BROWN, COHESIVE, FINE TO MED., MOIST	%		
	18			%		
	19			%		
	20		SILTY SAND; LT. BROWN, FINE TO MED, COHESIVE, WET	%		
	21			%		
	22			10/10		
	23			%		
	24			%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: MW-05

SHEET 3 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	25		SANDY CLAY, LT. BROWN, MED. STIFF, ~~LOW PLAST.~~, WET MED. PLAST.	%		
	26			%		
	27					
	28		CLAYEY SILT W/ SAND, LT. BROWN, SOFT, WET, LOW PLAST.	%		
	29			%		
	30		CLAYEY SAND TO SILT, LT. BROWN, FINE TO MED., COHESIVE, WET	%		
	31			%		
	32			5/5		
	33			%		
	34		SANDY SILT, LT. BROWN, SOFT, WET, LOW PLAST.	%		
	35		SAA, V. WET			
	36			%		
	37		CLAYEY SAND, LT. BROWN, COHESIVE, FINE TO MED., WET	5/5 %		
	38					
	39		CLAY, LT. BROWN TO GREY, STIFF, HIGH PLAST., WET	%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

DRILLING LOG (Continuation Sheet)
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: MW-05

SHEET 4 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		40		%		SET WELL SCREEN 30'-40' BGS
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		

1. HOLE NUMBER

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: LHAAP

SHEET 1 OF 4 SHEETS

4. PROJECT: LHAAP 18/24

5. LOCATION (Coordinates or Station): KARNACK, TX

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): MW-06

8. NAME OF DRILLER: COLBY POUNDS

9. DIRECTION OF HOLE: ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: 52' BGS

13. SIZE AND TYPE OF BIT: 6"

14. DATUM FOR ELEVATION SHOWN (TBM or MSL):

15. MANUFACTURERS DESIGNATION OF DRILL: GEOPROBE 8150 LS

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED — b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER: —

19. DATE HOLE (YYYYMMDD): a. STARTED 06/15/2021 b. COMPLETED

20. ELEVATION TOP OF HOLE (feet): —

21. TOTAL CORE RECOVERY FOR BORING %: —

22. SIGNATURE OF INSPECTOR: JM Moore

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	SANDY SILT W/ CLAY, LT. BROWN, SOFT, MED. PLAST., WET	%		
		2		%		
		3		9M		
		4	SILTY CLAY W/ SAND, LT. BROWN TO ORANGE-BROWN, MED. STIFF, MED. PLAST., WET	%		
		5		10/10		
		6		%		
		7		%		
		8	SILTY SAND, LT. BRWN. TO GREY, MED. GRAIN, COHESIVE, WET	%		
		9		%		

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: MW-06

SHEET 2 OF 4 SHEETS

3. PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		10		%		
		11	SAA	%		
		12		%		
		13		%		
		14		10/10 %		
		15		%		
		16		%		
		17		%		
		18		%		
		19		%		
		20		%		
		21		%		
		22	SAA	10/10 %		
		23		%		
		24		%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: MW-06

SHEET 3 OF 4 SHEETS

PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		25		%		
		26		%		
		27		%		
		28		%		
		29		%		
		30	SILTY SAND, SOME CLAY, FINE TO MED, WET, COHESIVE, DARK BROWN TO DARK GREY	%		
		31		%		
		32		5/5		
		33		%		
		34		%		
		35	SAA, INCREASING CLAY	%		
		36		%		
		37		10/10		
		38	SILTY CLAY, GREY, MED. STIFF, HIGH PLAST., WET	%		
		39		%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: MW-06

SHEET 4 OF 4 SHEETS

PROJECT: LHAAP 18/24

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		40	SAND, DARK BROWN TO GREY, MED TO COARSE, WET	%		SET OUTER CASING FROM SURFACE TO 40' BGS, 10" DIAMETER
		41		%		
		42		%		
		43		%		
		44		%		
		45	SAA	%		
		46		%		
		47		%		
		48		%		
		49		%		
		50	CLAY / GRAVEL, DARK BROWN, WET,	%		BACK FILL 1' W/ BENTONITE. SET WELL, 41'-51' BGS SCREEN
		51		%		
		52		%		
		53		%		
		54				

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

Attachment 2. Well Completion Forms

01077137

MONITORING WELL COMPLETION RECORD

MONITORING WELL
MONITORING WELL NO.: 1824DPTMW1
PROJECT: LHAAP 18/24
SITE: LHAAP
BOREHOLE NO.:
WELL PERMIT NO.:
TOC TO BOTTOM OF WELL: 36.10'

DRILLING INFORMATION
DRILLING BEGAN:
DATE: 06-18-2021 TIME: 1240
WELL INSTALLATION BEGAN:
DATE: 06-18-2021 TIME: 1315
WELL INSTALLATION FINISHED:
DATE: 06-18-2021 TIME: 1430
DRILLING CO.: WHE
DRILLER: Colby Pounds
LICENSE:
DRILL RIG: Geoprobe 8150 LS
DRILLING METHOD:
- ❑ HOLLOW STEM AUGER
- ❑ AIR ROTARY
- ☒ OTHER: Sonic

DIAMETER OF AUGERS:
ID: 8" OD: 8 1/4"

WELL CASING
- ☒ SCHEDULE 40 PVC
- ☒ OTHER: Uncased

PRODUCT:
MFG. BY:
CASING DIAMETER:
ID: OD:
LENGTH OF CASING:

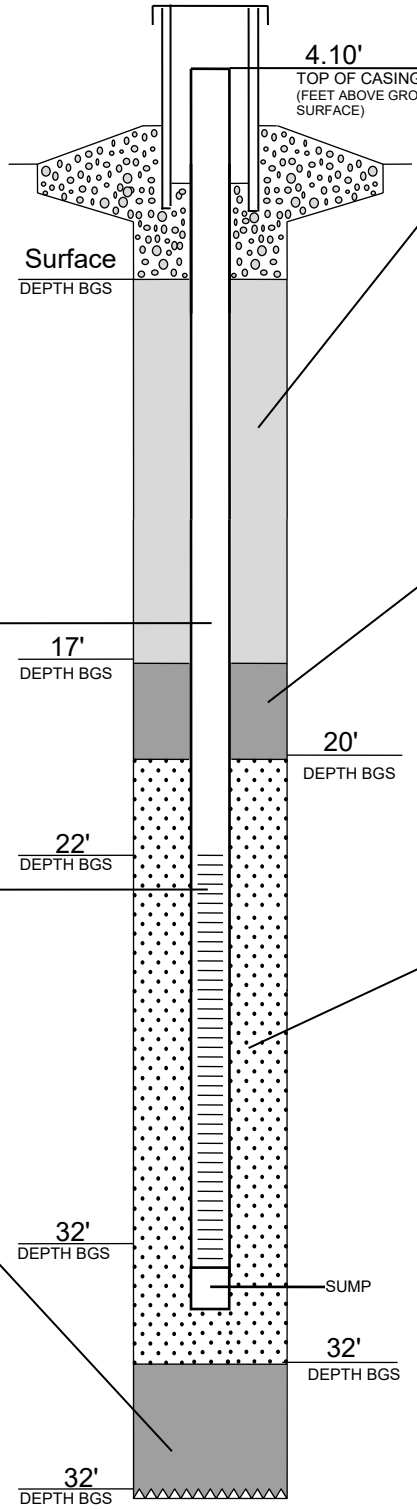
WELL SCREEN
- ☒ SCHEDULE 40 PVC
- ❑ OTHER:

PRODUCT: 4" x 10" SCH 40 PVC
MFG. BY: Env. Manufacturing Inc.
CASING DIAMETER:
ID: 4" OD: 4.5"
SLOT SIZE: 0.010"
LENGTH OF SCREEN: 10'

BOREHOLE BACKFILL
AMOUNT CALCULATED:
AMOUNT USED:
- ❑ BENTONITE CHIPS, SIZE:
- ❑ BENTONITE PELLETS, SIZE:
- ❑ SLURRY:
- ❑ FORMATION COLLAPSE:
- ❑ OTHER:

PRODUCT:
MFG. BY:
METHOD INSTALLED:
- ❑ POURED ❑ TREMIE
- ❑ OTHER:

SURFACE COMPLETION
- ❑ FLUSH MOUNT
- ☒ ABOVE GROUND WITH BUMPER POST
- ☒ CONCRETE ❑ ASPHALT



SURVEY INFORMATION
TOC ELEVATION: 187.967
GROUND SURFACE ELEVATION: 184.956
NORTHING: 6954775.828
EASTING: 3317983.094
DATE SURVEYED: 30 June 2021
SURVEY CO.: MTX Surveying

ANNULAR SEAL
VOLUME CALCULATED:
AMOUNT USED:
- ☒ GROUT FORMULA (PERCENTAGES)
  - PORTLAND CEMENT: 4 bags
  - BENTONITE:
  - WATER:
- ❑ PREPARED MIX
  - PRODUCT:
  - MFG. BY:

METHOD INSTALLED:
- ❑ POURED ❑ TREMIE
- ❑ OTHER:

BENTONITE SEAL
VOLUME CALCULATED:
AMOUNT USED: 50 lbs
- ❑ PELLETS, SIZE:
- ❑ CHIPS, SIZE:
- ❑ OTHER:

PRODUCT: Pel Plug
MFG. BY: PDS Co.
METHOD INSTALLED:
- ☒ POURED ❑ TREMIE
- ❑ OTHER:

AMOUNT OF WATER USED:

FILTER PACK
- ❑ PREPACKED FILTER

VOLUME CALCULATED:
AMOUNT USED: 6 500-lb Bags
- ☒ SAND, SIZE: 20/40

PRODUCT: Pool Filter Media
MFG. BY: Consolidated Aggregate
METHOD INSTALLED:
- ☒ POURED ❑ TREMIE
- ❑ OTHER:

WATER LEVEL:
(BTOC AFTER WELL INSTALLATION)

CENTRALIZERS USED?
❑ YES ☒ NO;
CENTRALIZER DEPTHS:

LEGEND
BGS = BELOW GROUND SURFACE
BTOC = BELOW TOP OF CASING
N/A = NOT APPLICABLE
NR = NOT RECORDED
TOC = TOP OF CASING

01077138

MONITORING WELL COMPLETION RECORD

MONITORING WELL
MONITORING WELL NO.: 1824DPTMW2
PROJECT: LHAAP 18/24
SITE: LHAAP
BOREHOLE NO.:
WELL PERMIT NO.:
TOC TO BOTTOM OF WELL: 42.72'

DRILLING INFORMATION
DRILLING BEGAN:
DATE: 06-16-2021 TIME: 1125
WELL INSTALLATION BEGAN:
DATE: 06-16-2021 TIME: 1200
WELL INSTALLATION FINISHED:
DATE: 06-16-2021 TIME: 1405
DRILLING CO.: WHE
DRILLER: Colby Pounds
LICENSE:
DRILL RIG: Geoprobe 8150 LS
DRILLING METHOD:
- ❑ HOLLOW STEM AUGER
- ❑ AIR ROTARY
- ☒ OTHER: Sonic

DIAMETER OF AUGERS:
ID: 8" OD: 8 1/4"

WELL CASING
- ☒ SCHEDULE 40 PVC
- ☒ OTHER: Uncased

PRODUCT:
MFG. BY:
CASING DIAMETER:
ID: OD:
LENGTH OF CASING:

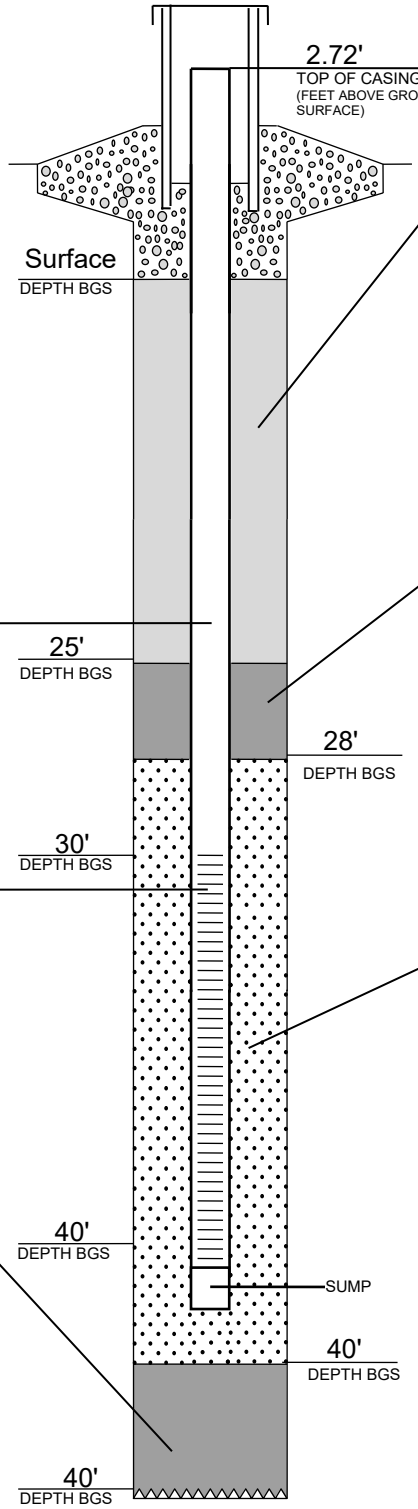
WELL SCREEN
- ☒ SCHEDULE 40 PVC
- ❑ OTHER:

PRODUCT: 4" x 10" SCH 40 PVC
MFG. BY: Env. Manufacturing Inc.
CASING DIAMETER:
ID: 4" OD: 4.5"
SLOT SIZE: 0.010"
LENGTH OF SCREEN: 10'

BOREHOLE BACKFILL
AMOUNT CALCULATED:
AMOUNT USED:
- ❑ BENTONITE CHIPS, SIZE:
- ❑ BENTONITE PELLETS, SIZE:
- ❑ SLURRY:
- ❑ FORMATION COLLAPSE:
- ❑ OTHER:

PRODUCT:
MFG. BY:
METHOD INSTALLED:
- ❑ POURED ❑ TREMIE
- ❑ OTHER:

SURFACE COMPLETION
- ❑ FLUSH MOUNT
- ☒ ABOVE GROUND WITH BUMPER POST
- ☒ CONCRETE ❑ ASPHALT



SURVEY INFORMATION
TOC ELEVATION: 197.903
GROUND SURFACE ELEVATION: 194.907
NORTHING: 6954303.382
EASTING: 3317393.075
DATE SURVEYED: 30 June 2021
SURVEY CO.: MTX Surveying

ANNULAR SEAL
VOLUME CALCULATED:
AMOUNT USED:
- ☒ GROUT FORMULA (PERCENTAGES)
  - PORTLAND CEMENT: 4 bags
  - BENTONITE:
  - WATER:
- ❑ PREPARED MIX
  - PRODUCT:
  - MFG. BY:

METHOD INSTALLED:
- ❑ POURED ❑ TREMIE
- ❑ OTHER:

BENTONITE SEAL
VOLUME CALCULATED:
AMOUNT USED: 50 lbs
- ❑ PELLETS, SIZE:
- ❑ CHIPS, SIZE:
- ❑ OTHER:

PRODUCT: Pel Plug
MFG. BY: PDS Co.
METHOD INSTALLED:
- ☒ POURED ❑ TREMIE
- ❑ OTHER:

AMOUNT OF WATER USED:

FILTER PACK
- ❑ PREPACKED FILTER

VOLUME CALCULATED:
AMOUNT USED: 6 50-lb Bags
- ☒ SAND, SIZE: 20/40

PRODUCT: Pool Filter Media
MFG. BY: Consolidated Aggregate
METHOD INSTALLED:
- ☒ POURED ❑ TREMIE
- ❑ OTHER:

WATER LEVEL:
(BTOC AFTER WELL INSTALLATION)

CENTRALIZERS USED?
❑ YES ☒ NO;
CENTRALIZER DEPTHS:

LEGEND
BGS = BELOW GROUND SURFACE
BTOC = BELOW TOP OF CASING
N/A = NOT APPLICABLE
NR = NOT RECORDED
TOC = TOP OF CASING

01077139

MONITORING WELL COMPLETION RECORD

MONITORING WELL
MONITORING WELL NO.: 1824DPTMW3
PROJECT: LHAAP 18/24
SITE: LHAAP
BOREHOLE NO.:
WELL PERMIT NO.:
TOC TO BOTTOM OF WELL: 40.77'

DRILLING INFORMATION
DRILLING BEGAN:
DATE: 06-16-2021 TIME: 1545
WELL INSTALLATION BEGAN:
DATE: 06-16-2021 TIME: 1620
WELL INSTALLATION FINISHED:
DATE: 06-16-2021 TIME: 1820
DRILLING CO.: WHE
DRILLER: Colby Pounds
LICENSE:
DRILL RIG: Geoprobe 8150 LS
DRILLING METHOD:
- ❑ HOLLOW STEM AUGER
- ❑ AIR ROTARY
- ☒ OTHER: Sonic

DIAMETER OF AUGERS:
ID: 8" OD: 8 1/4"

WELL CASING
- ☒ SCHEDULE 40 PVC
- ☒ OTHER: Uncased

PRODUCT:
MFG. BY:
CASING DIAMETER:
ID: OD:
LENGTH OF CASING:

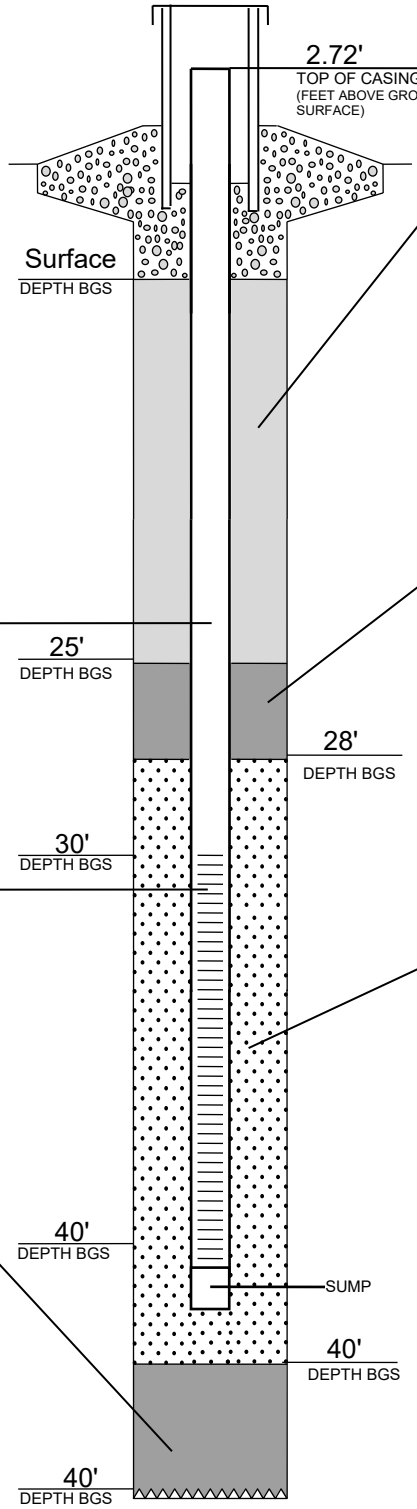
WELL SCREEN
- ☒ SCHEDULE 40 PVC
- ❑ OTHER:

PRODUCT: 4" x 10" SCH 40 PVC
MFG. BY: Env. Manufacturing Inc.
CASING DIAMETER:
ID: 4" OD: 4.5"
SLOT SIZE: 0.010"
LENGTH OF SCREEN: 10'

BOREHOLE BACKFILL
AMOUNT CALCULATED:
AMOUNT USED:
- ❑ BENTONITE CHIPS, SIZE:
- ❑ BENTONITE PELLETS, SIZE:
- ❑ SLURRY:
- ❑ FORMATION COLLAPSE:
- ❑ OTHER:

PRODUCT:
MFG. BY:
METHOD INSTALLED:
- ❑ POURED ❑ TREMIE
- ❑ OTHER:

SURFACE COMPLETION
- ❑ FLUSH MOUNT
- ☒ ABOVE GROUND WITH BUMPER POST
- ☒ CONCRETE ❑ ASPHALT



SURVEY INFORMATION
TOC ELEVATION: 197.299
GROUND SURFACE ELEVATION: 193.883
NORTHING: 6954712.546
EASTING: 3317318.031
DATE SURVEYED: 30 June 2021
SURVEY CO.: MTX Surveying

ANNULAR SEAL
VOLUME CALCULATED:
AMOUNT USED:
- ☒ GROUT FORMULA (PERCENTAGES)
  - PORTLAND CEMENT: 4 bags
  - BENTONITE:
  - WATER:
- ❑ PREPARED MIX
  - PRODUCT:
  - MFG. BY:

METHOD INSTALLED:
- ❑ POURED ❑ TREMIE
- ❑ OTHER:

BENTONITE SEAL
VOLUME CALCULATED:
AMOUNT USED: 50 lbs
- ❑ PELLETS, SIZE:
- ❑ CHIPS, SIZE:
- ❑ OTHER:

PRODUCT: Pel Plug
MFG. BY: PDS Co.
METHOD INSTALLED:
- ☒ POURED ❑ TREMIE
- ❑ OTHER:

AMOUNT OF WATER USED:

FILTER PACK
- ❑ PREPACKED FILTER

VOLUME CALCULATED:
AMOUNT USED: 6 50-lb Bags
- ☒ SAND, SIZE: 20/40

PRODUCT: Pool Filter Media
MFG. BY: Consolidated Aggregate
METHOD INSTALLED:
- ☒ POURED ❑ TREMIE
- ❑ OTHER:

WATER LEVEL:
(BTOC AFTER WELL INSTALLATION)

CENTRALIZERS USED?
❑ YES ☒ NO;
CENTRALIZER DEPTHS:

LEGEND
BGS = BELOW GROUND SURFACE
BTOC = BELOW TOP OF CASING
N/A = NOT APPLICABLE
NR = NOT RECORDED
TOC = TOP OF CASING

01077140

MONITORING WELL COMPLETION RECORD

MONITORING WELL
MONITORING WELL NO.: 1824DPTMW4
PROJECT: LHAAP 18/24
SITE: LHAAP
BOREHOLE NO.:
WELL PERMIT NO.:
TOC TO BOTTOM OF WELL: 43.38'

DRILLING INFORMATION
DRILLING BEGAN:
DATE: 06-17-2021 TIME: 1100
WELL INSTALLATION BEGAN:
DATE: 06-17-2021 TIME: 1130
WELL INSTALLATION FINISHED:
DATE: 06-17-2021 TIME: 1500
DRILLING CO.: WHE
DRILLER: Colby Pounds
LICENSE:
DRILL RIG: Geoprobe 8150 LS
DRILLING METHOD:
- ❑ HOLLOW STEM AUGER
- ❑ AIR ROTARY
- ☒ OTHER: Sonic

DIAMETER OF AUGERS:
ID: 8" OD: 8 1/4"

WELL CASING
- ☒ SCHEDULE 40 PVC
- ☒ OTHER: Uncased

PRODUCT:
MFG. BY:
CASING DIAMETER:
ID: OD:
LENGTH OF CASING:

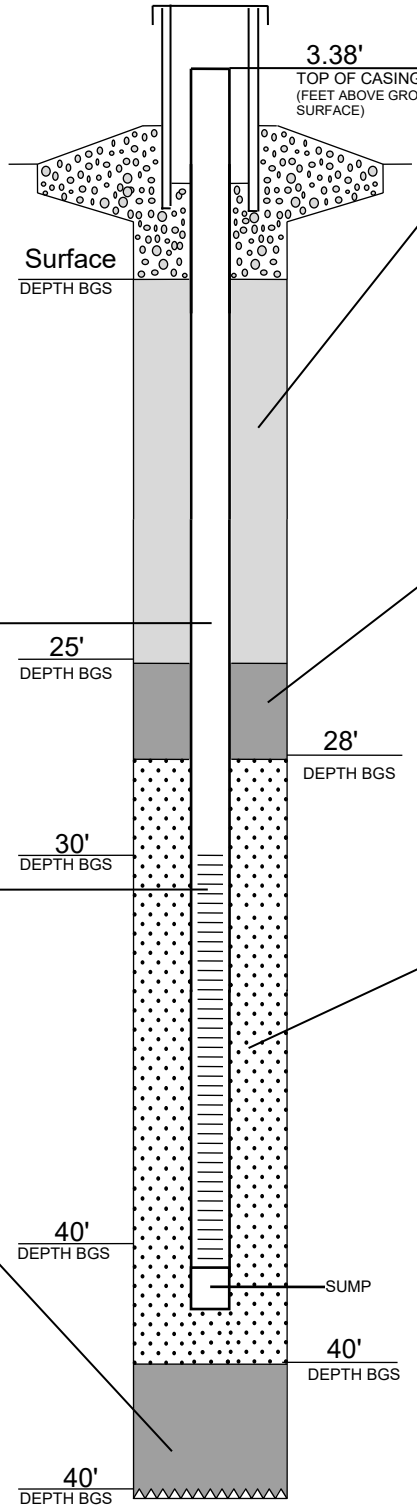
WELL SCREEN
- ☒ SCHEDULE 40 PVC
- ❑ OTHER:

PRODUCT: 4" x 10" SCH 40 PVC
MFG. BY: Env. Manufacturing Inc.
CASING DIAMETER:
ID: 4" OD: 4.5"
SLOT SIZE: 0.010"
LENGTH OF SCREEN: 10'

BOREHOLE BACKFILL
AMOUNT CALCULATED:
AMOUNT USED:
- ❑ BENTONITE CHIPS, SIZE:
- ❑ BENTONITE PELLETS, SIZE:
- ❑ SLURRY:
- ❑ FORMATION COLLAPSE:
- ❑ OTHER:

PRODUCT:
MFG. BY:
METHOD INSTALLED:
- ❑ POURED ❑ TREMIE
- ❑ OTHER:

SURFACE COMPLETION
- ❑ FLUSH MOUNT
- ☒ ABOVE GROUND WITH BUMPER POST
- ☒ CONCRETE ❑ ASPHALT



SURVEY INFORMATION
TOC ELEVATION: 196.254
GROUND SURFACE ELEVATION: 192.915
NORTHING: 6954052.499
EASTING: 3317771.698
DATE SURVEYED: 30 June 2021
SURVEY CO.: MTX Surveying

ANNULAR SEAL
VOLUME CALCULATED:
AMOUNT USED:
- ☒ GROUT FORMULA (PERCENTAGES)
  - PORTLAND CEMENT: 4 bags
  - BENTONITE:
  - WATER:
- ❑ PREPARED MIX
  - PRODUCT:
  - MFG. BY:

METHOD INSTALLED:
- ❑ POURED ❑ TREMIE
- ❑ OTHER:

BENTONITE SEAL
VOLUME CALCULATED:
AMOUNT USED: 50 lbs
- ❑ PELLETS, SIZE:
- ❑ CHIPS, SIZE:
- ❑ OTHER:

PRODUCT: Pel Plug
MFG. BY: PDS Co.
METHOD INSTALLED:
- ☒ POURED ❑ TREMIE
- ❑ OTHER:

AMOUNT OF WATER USED:

FILTER PACK
- ❑ PREPACKED FILTER

VOLUME CALCULATED:
AMOUNT USED: 6 50-lb Bags
- ☒ SAND, SIZE: 20/40

PRODUCT: Pool Filter Media
MFG. BY: Consolidated Aggregate
METHOD INSTALLED:
- ☒ POURED ❑ TREMIE
- ❑ OTHER:

WATER LEVEL:
(BTOC AFTER WELL INSTALLATION)

CENTRALIZERS USED?
❑ YES ☒ NO;
CENTRALIZER DEPTHS:

LEGEND
BGS = BELOW GROUND SURFACE
BTOC = BELOW TOP OF CASING
N/A = NOT APPLICABLE
NR = NOT RECORDED
TOC = TOP OF CASING

01077141

MONITORING WELL COMPLETION RECORD

MONITORING WELL
MONITORING WELL NO.: 1824DPTMW5
PROJECT: LHAAP 18/24
SITE: LHAAP
BOREHOLE NO.:
WELL PERMIT NO.:
TOC TO BOTTOM OF WELL: 42.80'

DRILLING INFORMATION
DRILLING BEGAN:
DATE: 06-15-2021 TIME: 1650
WELL INSTALLATION BEGAN:
DATE: 06-15-2021 TIME: 1730
WELL INSTALLATION FINISHED:
DATE: 06-16-2021 TIME: 0750
DRILLING CO.: WHE
DRILLER: Colby Pounds
LICENSE:
DRILL RIG: Geoprobe 8150 LS
DRILLING METHOD:
- ❑ HOLLOW STEM AUGER
- ❑ AIR ROTARY
- ☒ OTHER: Sonic

DIAMETER OF AUGERS:
ID: 8" OD: 8 1/4"

WELL CASING
- ☒ SCHEDULE 40 PVC
- ☒ OTHER: Uncased

PRODUCT:
MFG. BY:
CASING DIAMETER:
ID: OD:
LENGTH OF CASING:

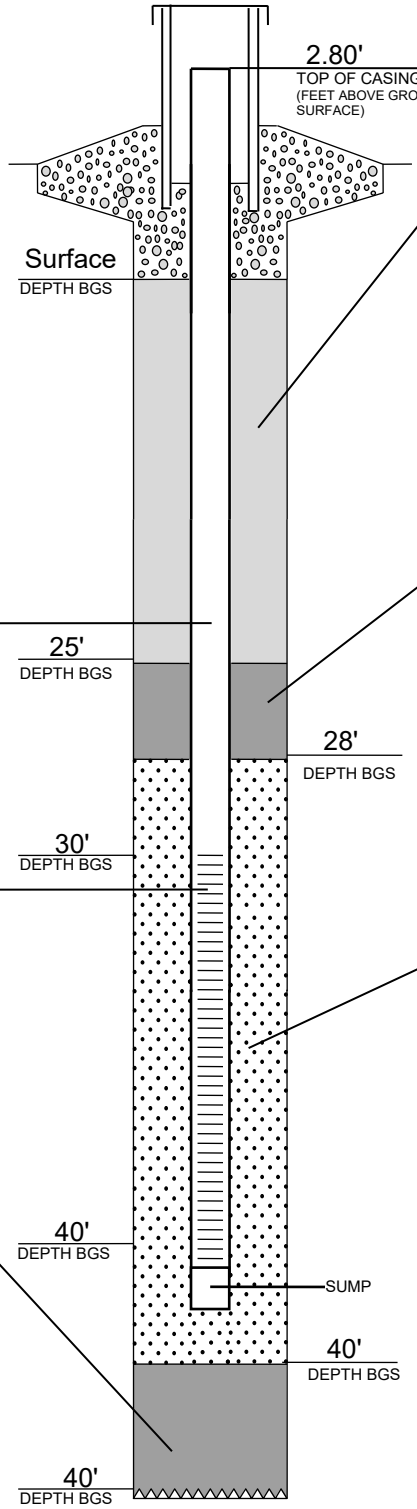
WELL SCREEN
- ☒ SCHEDULE 40 PVC
- ❑ OTHER:

PRODUCT: 4" x 10" SCH 40 PVC
MFG. BY: Env. Manufacturing Inc.
CASING DIAMETER:
ID: 4" OD: 4.5"
SLOT SIZE: 0.010"
LENGTH OF SCREEN: 10'

BOREHOLE BACKFILL
AMOUNT CALCULATED:
AMOUNT USED:
- ❑ BENTONITE CHIPS, SIZE:
- ❑ BENTONITE PELLETS, SIZE:
- ❑ SLURRY:
- ❑ FORMATION COLLAPSE:
- ❑ OTHER:

PRODUCT:
MFG. BY:
METHOD INSTALLED:
- ❑ POURED ❑ TREMIE
- ❑ OTHER:

SURFACE COMPLETION
- ❑ FLUSH MOUNT
- ☒ ABOVE GROUND WITH BUMPER POST
- ☒ CONCRETE ❑ ASPHALT



SURVEY INFORMATION
TOC ELEVATION: 197.573
GROUND SURFACE ELEVATION: 194.052
NORTHING: 6953389.874
EASTING: 3316381.081
DATE SURVEYED: 30 June 2021
SURVEY CO.: MTX Surveying

ANNULAR SEAL
VOLUME CALCULATED:
AMOUNT USED:
- ☒ GROUT FORMULA (PERCENTAGES)
  - PORTLAND CEMENT: 4 bags
  - BENTONITE:
  - WATER:
- ❑ PREPARED MIX
  - PRODUCT:
  - MFG. BY:

METHOD INSTALLED:
- ❑ POURED ❑ TREMIE
- ❑ OTHER:

BENTONITE SEAL
VOLUME CALCULATED:
AMOUNT USED: 50 lbs
- ❑ PELLETS, SIZE:
- ❑ CHIPS, SIZE:
- ❑ OTHER:

PRODUCT: Pel Plug
MFG. BY: PDS Co.
METHOD INSTALLED:
- ☒ POURED ❑ TREMIE
- ❑ OTHER:

AMOUNT OF WATER USED:

FILTER PACK
- ❑ PREPACKED FILTER

VOLUME CALCULATED:
AMOUNT USED: 6 50-lb Bags
- ☒ SAND, SIZE: 20/40

PRODUCT: Pool Filter Media
MFG. BY: Consolidated Aggregate
METHOD INSTALLED:
- ☒ POURED ❑ TREMIE
- ❑ OTHER:

WATER LEVEL:
(BTOC AFTER WELL INSTALLATION)

CENTRALIZERS USED?
❑ YES ☒ NO;
CENTRALIZER DEPTHS:

LEGEND
BGS = BELOW GROUND SURFACE
BTOC = BELOW TOP OF CASING
N/A = NOT APPLICABLE
NR = NOT RECORDED
TOC = TOP OF CASING

01077142

MONITORING WELL COMPLETION RECORD

MONITORING WELL
MONITORING WELL NO.: 1824DPTMW6
PROJECT: LHAAP 18/24
SITE: LHAAP
BOREHOLE NO.:
WELL PERMIT NO.:
TOC TO BOTTOM OF WELL: 52.15'

DRILLING INFORMATION
DRILLING BEGAN:
DATE: 06-15-2021 TIME: 0925
WELL INSTALLATION BEGAN:
DATE: 06-15-2021 TIME: 1110
WELL INSTALLATION FINISHED:
DATE: 06-15-2021 TIME: 1400
DRILLING CO.: WHE
DRILLER: Colby Pounds
LICENSE:
DRILL RIG: Geoprobe 8150 LS
DRILLING METHOD:
- ❑ HOLLOW STEM AUGER
- ❑ AIR ROTARY
- ☒ OTHER: Sonic

DIAMETER OF AUGERS:
ID: 8" OD: 8 1/4"

WELL CASING
- ☒ SCHEDULE 40 PVC
- ☒ OTHER: Uncased

PRODUCT:
MFG. BY:
CASING DIAMETER:
ID: OD:
LENGTH OF CASING:

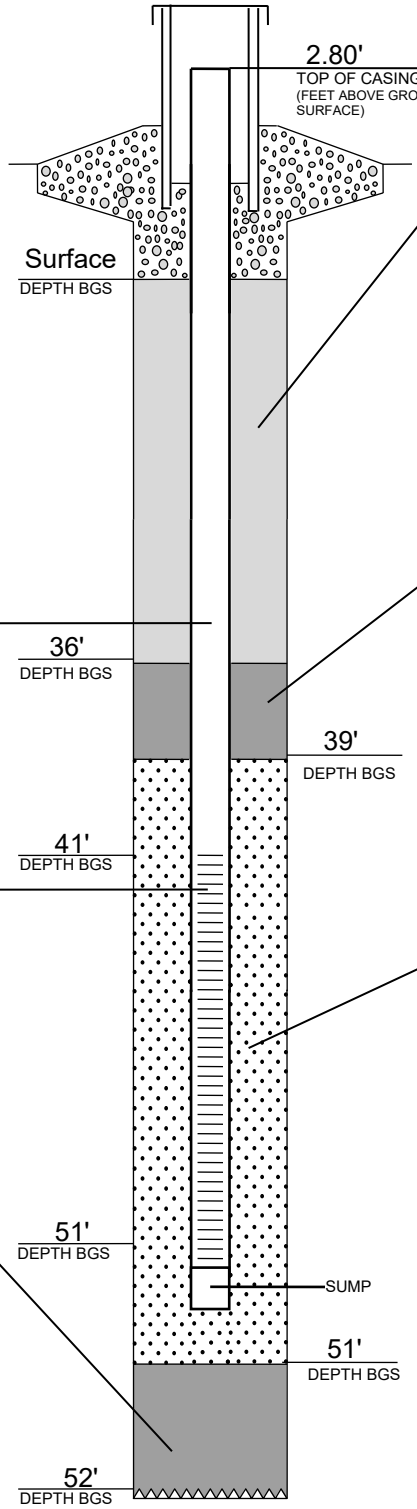
WELL SCREEN
- ☒ SCHEDULE 40 PVC
- ❑ OTHER:

PRODUCT: 4" x 10" SCH 40 PVC
MFG. BY: Env. Manufacturing Inc.
CASING DIAMETER:
ID: 4" OD: 4.5"
SLOT SIZE: 0.010"
LENGTH OF SCREEN: 10'

BOREHOLE BACKFILL
AMOUNT CALCULATED:
AMOUNT USED:
- ❑ BENTONITE CHIPS, SIZE:
- ❑ BENTONITE PELLETS, SIZE:
- ❑ SLURRY:
- ❑ FORMATION COLLAPSE:
- ❑ OTHER:

PRODUCT:
MFG. BY:
METHOD INSTALLED:
- ❑ POURED ❑ TREMIE
- ❑ OTHER:

SURFACE COMPLETION
- ❑ FLUSH MOUNT
- ☒ ABOVE GROUND WITH BUMPER POST
- ☒ CONCRETE ❑ ASPHALT



SURVEY INFORMATION
TOC ELEVATION: 180.351
GROUND SURFACE ELEVATION: 177.099
NORTHING: 6953865.251
EASTING: 3315957.29
DATE SURVEYED: 30 June 2021
SURVEY CO.: MTX Surveying

ANNULAR SEAL
VOLUME CALCULATED:
AMOUNT USED:
- ☒ GROUT FORMULA (PERCENTAGES)
  - PORTLAND CEMENT: 11 bags
  - BENTONITE:
  - WATER: 500 gallons
- ❑ PREPARED MIX
  - PRODUCT:
  - MFG. BY:

METHOD INSTALLED:
- ❑ POURED ❑ TREMIE
- ❑ OTHER:

BENTONITE SEAL
VOLUME CALCULATED:
AMOUNT USED: 15 lbs
- ❑ PELLETS, SIZE:
- ☒ CHIPS, SIZE:
- ❑ OTHER:

PRODUCT: Pel Plug
MFG. BY: PDS Co.
METHOD INSTALLED:
- ☒ POURED ❑ TREMIE
- ❑ OTHER:

AMOUNT OF WATER USED:

FILTER PACK
- ❑ PREPACKED FILTER

VOLUME CALCULATED:
AMOUNT USED: 6 50-lb Bags
- ☒ SAND, SIZE: 20/40

PRODUCT: Pool Filter Media
MFG. BY: Consolidated Aggregate
METHOD INSTALLED:
- ☒ POURED ❑ TREMIE
- ❑ OTHER:

WATER LEVEL:
(BTOC AFTER WELL INSTALLATION)

CENTRALIZERS USED?
❑ YES ☒ NO;
CENTRALIZER DEPTHS:

LEGEND
BGS = BELOW GROUND SURFACE
BTOC = BELOW TOP OF CASING
N/A = NOT APPLICABLE
NR = NOT RECORDED
TOC = TOP OF CASING

Attachment 3. Well Development Forms

00191261

MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: LHAAP 18/24		LocID: 1824DPTMW1					Date: 06/24/2021			
	Project Name: Longhorn Army Ammunition Plant		Project #.					Recorded By: JM Checked By:			
EQUIPMENT	Water Quality Meter Type/ID #: YSI PRO PLUS							Water Level Indicator Type/ID #: HERON DIPPER-T			
	Equipment Group:							Equpment Group:			
	Development Equipment: TORNADO 2.0 SUBMERSIBLE PUMP							Equipment Decon.: 3 BUCKETS, ALCONOX			
WELL INFO	Casing I.D. (in) [a]: 4"		Unit Casing Volume (gal/lin ft) [b]: 0.65					Initial Depth to Water (ft) [c]: 23.12' BTOC			
	Total Well Depth (ft) [d]: 36.10' BTOC		Water Column Thickness (ft) [d-c]: 12.98'					Well Volume (gal) ([d-c] x b): 8.437			
	Ground Condition of Well: DRY							Remarks:			
CASING INFO	Casing I.D. (in) [a]:	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
	Unit Casing Volume (gal/lin ft) [b]:	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pH	Conductivity (mS/cm)	DO (mg/L)	Turb. (NTU)	~~Sed. (mL/L)~~	ORP ~~Radiation~~ (mV)	Remarks (odor, clarity, etc.)
06-23-21	1610	PUMP		~25 GAL									WHE DEV.
06-24-21	0800	PUMP	23.12	~~300 mL/min~~ 300 mL/min		19.3	6.78	5.68	3.97	190		110.4	HDR DEV.
	0805		26.73			20.7	6.73	5.50	3.40	549		110.0	
	0810		26.71			20.8	6.72	5.51	3.44	563		110.6	
	0815		27.06			20.8	6.72	5.58	3.31	571		110.9	
	0820		27.31			21.0	6.70	5.61	3.17	577		111.3	
	0825		27.61			21.0	6.68	5.61	3.06	461		112.1	
	0830		27.70			21.0	6.68	5.64	2.97	317		112.7	
	0835		27.93			21.0	6.68	5.64	2.89	226		112.7	
	0840		28.14			21.2	6.69	5.64	2.84	193		112.8	
	0845		28.46			21.2	6.69	5.63	2.84	164		112.9	

Development Criteria: 1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND 4) remove water added during drilling and construction

MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: LHAAP 18/24	LocID: ~~06/26 JM~~ 1824DPTMW1
	Project Name: Longhorn Army Ammunition Plant	Project #:

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pH	Conductivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mg/L)	~~Radiation~~ ORP (mV)	Remarks (odor, clarity, etc.)
	0850	PUMP	28.60			21.2	6.69	5.61	2.85	121		113.2	SURGE
	0855		28.81			21.2	6.70	5.56	3.79	190		113.3	
	0900		28.94			21.3	6.71	5.50	3.05	201		113.5	
	0905		29.21			21.5	6.70	5.51	3.07	184		113.8	
	0910		29.38			21.5	6.70	5.54	2.98	168		113.9	
	0915		29.44			21.5	6.70	5.55	3.03	107		114.1	
	0920		29.62			21.5	6.70	5.55	3.07	86.4		114.2	
	0925		29.87			21.4	6.71	5.55	3.09	77.9		114.2	
	0930		29.73			21.7	6.71	5.55	2.76	71.4		114.4	
	0935		29.66			22.3	6.71	5.56	2.63	79.1		114.8	
	0940		29.54			22.8	6.72	5.57	2.54	65.8		114.9	
	0945		29.46			22.9	6.70	5.69	2.54	60.3		115.5	
	0950		29.34			23.1	6.70	5.75	2.53	55.1		115.7	
	0955		29.31			23.1	6.68	5.89	2.51	53.6		115.9	
	1000		29.23			23.0	6.69	5.94	2.46	49.2		116.0	
	1005		29.20			23.0	6.66	6.00	2.32	44.3		116.2	
	1010		29.19			23.1	6.66	6.02	2.29	46.0		116.2	
	1015		29.18			23.0	6.66	6.07	2.17	44.6		116.2	
	1020		29.16			23.0	6.64	6.18	2.13	43.5		116.2	
	1025		29.31			22.9	6.64	6.25	1.91	42.8		116.2	

Development Criteria: 1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND 4) remove water added during drilling and construction

00191262

MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: LHAAP 18/24	LocID: 1824DPTMW1
	Project Name: Longhorn Army Ammunition Plant	Project #:

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pH	Conductivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mg/L)	ORP ~~Radiation~~ (mV)	Remarks (odor, clarity, etc.)
	1030		29.42			21.7	6.64	6.28	1.79	36.4		116.3	
	1035		29.50			22.3	6.63	6.30	1.68	31.7		116.4	
	1040		29.54			22.8	6.63	6.30	1.67	30.9		116.3	
	1045		29.61			22.9	6.63	6.30	1.91	29.1		116.3	
	1050		29.68			23.1	6.63	6.31	2.10	27.8		116.3	
	1055		29.74			23.1	6.64	6.30	2.21	25.2		116.6	
	1100		29.86			23.0	6.64	6.30	2.29	21.8		116.7	
	1105		29.93			23.0	6.64	6.30	2.37	20.4		116.9	
	1110		30.12			23.1	6.65	6.31	2.40	20.1		117.0	
	1115		30.19			22.8	6.65	6.31	2.45	19.4		117.1	
	1120		30.21			22.8	6.65	6.32	2.46	18.9		117.9	
	1125		30.23			22.8	6.65	6.34	2.47	18.3		118.6	
	1130		30.26			22.6	6.66	6.34	2.45	17.6		118.8	
	1135		30.28			22.6	6.66	6.36	2.45	16.1		118.8	
	1140		30.31			22.5	6.66	6.38	2.43	15.5		118.8	
	1145		30.40			22.6	6.65	6.41	2.43	14.8		118.6	
	1150		30.43			22.6	6.65	6.43	2.45	14.1		118.6	
	1155		30.49			22.6	6.66	6.45	2.46	13.3		118.6	
	1200		30.54			22.6	6.65	6.46	2.46	12.9		118.5	
	1205		30.61			22.7	6.65	6.48	2.45	12.0		118.4	

Development Criteria: 1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND 4) remove water added during drilling and construction

MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: LHAAP 18/24	LocID: 1824DPTMW1
	Project Name: Longhorn Army Ammunition Plant	Project #:

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pH	Conduc-tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mg/L)	ORP ~~Radiation~~ (mV)	Remarks (odor, clarity, etc.)
	1210		30.61			22.7	6.65	6.53	2.42	11.1		118.4	
	1215		30.65			22.8	6.65	6.56	2.40	10.3		118.3	
	1220		30.70			22.8	6.65	6.52	2.35	8.53		118.6	
	1225		30.76			22.8	6.65	6.59	2.26	8.51		118.6	
	1230		30.79			22.8	6.65	6.61	2.19	8.42		118.6	
	1235		30.81			22.7	6.65	6.61	2.18	8.39		118.6	
	1240		30.94	55GAL		22.6	6.64	6.62	2.18	8.36		118.6	

Development Criteria: 1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND 4) remove water added during drilling and construction

00191261

MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: LHAAP 18/24	LocID: 1824DPTMW2	Date: 06-25-2021
	Project Name: Longhorn Army Ammunition Plant	Project #:	Recorded By: JM Checked By:
EQUIPMENT	Water Quality Meter Type/ID #: YSI PRO PLUS		Water Level Indicator Type/ID #: HERON DIPPER-T
	Equipment Group:		Equipment Group:
	Development Equipment: TORNADO 2.0 SUBMERSIBLE PUMP		Equipment Decon.: 3 BUCKETS, ALCONOX
WELL INFO	Casing I.D. (in) [a]: 4"	Unit Casing Volume (gal/lin ft) [b]: 0.65	Initial Depth to Water (ft) [c]: 28.13' BTOC
	Total Well Depth (ft) [d]: 42.72' BTOC	Water Column Thickness (ft) [d-c]: 14.59'	Well Volume (gal) [[d-c] x b]: 9.486AL
	Ground Condition of Well: HARD		Remarks:

CASING INFO											
Casing I.D. (in) [a]:	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (gal/lin ft) [b]:	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pH	Conductivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mL/L)	ORP ~~Radiation~~ (mV)	Remarks (odor, clarity, etc.)
		PUMP		~40GAL									WHE DEV.
06-25-21	1135		27.98'	~40GAL		20.3	7.23	4.69	6.28	292		130.3	HDR DEV.
	1140		28.51			22.1	6.90	4.69	4.97	88.9		121.4	
	1145		29.46			22.5	6.86	4.69	4.79	44.0		119.6	
	1150		29.81			22.8	6.86	4.69	4.77	36.3		120.3	
	1155		29.92			22.9	6.85	4.69	4.75	29.2		120.5	
	1200		30.05			23.0	6.84	4.69	4.76	20.1		120.6	
	1205		30.33			23.0	6.85	4.69	4.75	16.3		120.5	
	1210		30.64			23.0	6.85	4.69	4.73	13.8		120.1	
	1215		30.91			23.2	6.86	4.69	4.70	12.4		119.9	
	1220	↓	31.00			23.4	6.87	4.69	4.68	11.2		119.8	

Development Criteria: 1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND 4) remove water added during drilling and construction

00191262

MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: 1824DPTMW2	LocID: 1824DPTMW2
	Project Name: Longhorn Army Ammunition Plant	Project #:

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pH	Conductivity (mS/cm)	DO (mg/L)	Turb. (NTU)	~~Sed.~~ (mg/L)	~~Radiation~~ ORP (mV)	Remarks (odor, clarity, etc.)
06-25-21	1225	PUMP	31.23			23.4	6.87	4.69	4.65	10.3		120.1	
↓	1230	↓	31.50			23.5	6.87	4.69	4.60	9.42	↓	120.3	
	1235		31.76			23.5	6.87	4.69	4.55	7.61		120.6	
	1240		31.80			23.5	6.87	4.69	4.54	6.12		120.7	WELL DEVELOPED

Development Criteria: 1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND 4) remove water added during drilling and construction

00191261

MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: LHAAP 18/24		LocID: 1824DATMW3					Date: 06/29/2021			
	Project Name: Longhorn Army Ammunition Plant		Project #:					Recorded By: JM Checked By:			
EQUIPMENT	Water Quality Meter Type/ID #: YSI PRO PLUS							Water Level Indicator Type/ID #: HERON DIPPER-T			
	Equipment Group:							Equipment Group:			
	Development Equipment: TORNADO 2.0 SUBMERSIBLE PUMP							Equipment Decon: 3 BUCKETS, ALCONOX			
WELL INFO	Casing I.D. (in) [a]: 4		Unit Casing Volume (gal/in ft) [b]: 0.65					Initial Depth to Water (ft) [c]: 27.84' BTOC			
	Total Well Depth (ft) [d]: 40.77' BTOC		Water Column Thickness (ft) [d-c]: 12.93					Well Volume (gal) {[d-c] x b}: 8.40			
	Ground Condition of Well:							Remarks:			
CASING INFO	Casing I.D. (in) [a]:	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
	Unit Casing Volume (gal/in ft) [b]:	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pH	Conductivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mL/L)	ORP ~~Radiation~~ (mV)	Remarks (odor, clarity, etc.)
06-29-21	0750	PUMP	28.19			19.7	7.33	1.04	1.98	117		113.6	
	0755		28.55			19.6	7.02	1.04	1.54	107		112.1	
	0800		29.10			19.9	6.97	1.03	1.41	101		111.2	
	0805		29.35			20.6	6.93	1.02	1.29	88.1		109.4	
	0810		30.26			20.8	6.95	1.01	1.33	76.4		109.1	
	0815		30.96			20.9	6.99	1.00	1.36	61.6		108.8	
	0820		30.59			21.0	7.00	1.00	1.38	58.3		108.8	
	0825		31.14			21.1	7.00	1.00	1.40	56.2		109.3	
	0830		31.63			21.1	7.00	0.99	1.42	51.4		110.4	
	0835		32.21			21.2	7.00	0.99	1.42	43.6		111.6	

Development Criteria: 1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND 4) remove water added during drilling and construction

MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: LHAAP 18/24	LocID: 1824DPTMW3
	Project Name: Longhorn Army Ammunition Plant	Project #:

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pH	Conductivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mg/L)	~~Radiation~~ ORP (mV)	Remarks (odor, clarity, etc.)
06-29-21	0840	PUMP	32.64			21.4	7.01	0.99	1.43	37.1		112.0	SWITCH TO 10 MIN
	0850		31.63			21.7	7.02	0.99	1.50	35.4		112.9	INTERVALS
	0900		34.64			21.9	7.03	0.99	1.58	33.1		113.5	
	0910		35.49			22.1	7.03	0.99	1.57	32.4		114.2	
	0920		36.14			22.2	7.03	0.99	1.57	30.2		114.8	
	0930		39.89			22.3	7.02	0.99	1.56	28.9		114.8	
	0940		37.20			22.3	7.01	0.99	1.61	28.7		116.3	
	0950		38.21			22.6	7.02	0.99	1.67	33.3		115.5	
	1000		38.91			22.8	7.02	0.99	1.65	31.8		115.5	
	1010		39.47			23.0	7.04	0.99	1.62	30.1		115.6	

Development Criteria: 1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND 4) remove water added during drilling and construction

UU191261

Page 1 of 3

MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: LHAAP 18/24	LocID: 1824DPTMW4	Date: 06/25/2021
	Project Name: Longhorn Army Ammunition Plant	Project #	Recorded By: JM Checked By:
EQUIPMENT	Water Quality Meter Type/ID #: YSI PRO PLUS		Water Level Indicator Type/ID #: HERON DIPPER-T
	Equipment Group:		Equipment Group:
	Development Equipment: TORNADO 2.0 SUBMERSIBLE PUMP		Equipment Decon:
WELL INFO	Casing I.D. (in) [a]: 4"	Unit Casing Volume (gal/lin ft) [b]: 0.65	Initial Depth to Water (ft) [c]: 26.30' BTOC
	Total Well Depth (ft) [d]: 43.38' BTOC	Water Column Thickness (ft) [d-c]: 17.08'	Well Volume (gal) ([d-c] x b): 11.10
	Ground Condition of Well: ~~Soft~~ ~~Hard~~ Soft		Remarks:

CASING INFO										
Casing I.D. (in) [a]:	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (gal/lin ft) [b]:	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pH	Conductivity (mS/cm)	DO (mg/L)	Turb. (NTU)	~~Oxid. (mL Lt)~~	ORP ~~Radiation~~ (mV)	Remarks (odor, clarity, etc.)
		PUMP		~60 GAL								~~125.9~~	WHE DEV.
06-25-21	1510		35.22	~60 GAL		20.3	7.16	6.13	7.25	OOR		185.9	HDR DEV.
	1515		35.91			22.4	6.56	6.51	5.18	OOR		118.9	
	1520		36.24			22.1	6.51	6.54	5.11	286		119.4	
	1525		36.56			21.4	6.53	6.57	4.94	85.9		120.0	
	1530		37.16			21.6	6.54	6.53	5.26	64.7		125.7	
	1535		37.50			21.8	6.54	6.51	5.35	38.0		125.2	
	1540		37.84			22.1	6.54	6.46	5.27	29.8		124.9	
	1545		38.16			22.2	6.56	6.34	5.29	38.9		124.6	
	1550		38.35			22.5	6.59	6.28	5.32	47.7		124.3	

Development Criteria: 1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND 4) remove water added during drilling and construction

MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: LHAAP 18/24	LocID: 1824DPTMW4
	Project Name: Longhorn Army Ammunition Plant	Project #:

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pH	Conductivity (mS/cm)	DO (mg/L)	Turb. (NTU)	~~Sed.~~ (mg/L)	ORP ~~Radiation~~ (mV)	Remarks (odor, clarity, etc.)
06-25-21	1555	PUMP	38.50			22.6	6.59	6.28	5.41	44.6		123.7	
	1600		38.70			22.9	6.59	6.30	4.84	50.2		123.4	
	1605		38.85			23.0	6.59	6.34	4.75	53.6		124.3	
	1610		39.08			23.1	6.59	6.37	4.74	43.4		124.3	
	1615		39.19			23.3	6.59	6.37	4.78	40.0		124.1	
	1620		39.26			23.2	6.58	6.37	4.73	38.6		124.0	
	1625		39.47			23.3	6.58	6.38	4.67	32.2		123.9	
	1630		39.56			23.6	6.57	6.37	4.61	31.5		123.7	
	1635		39.74			23.6	6.57	6.37	4.43	32.1		123.7	
	1640		39.85			23.6	6.56	6.37	4.39	30.6		123.5	
	1645	↓	40.11	~72GAL		23.5	6.55	6.37	4.35	28.2		124.0	

Development Criteria: 1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND 4) remove water added during drilling and construction

00191261

MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: LHAAP 18/24	LocID: 1824DPTMW5	Date: 06-23-2021
	Project Name: Longhorn Army Ammunition Plant	Project #:	Recorded By: JM Checked By:
EQUIPMENT	Water Quality Meter Type/ID #: YSI PRO PLUS		Water Level Indicator Type/ID #: HERON DIPPER-T
	Equipment Group:		Equpment Group:
	Development Equipment: TORNADO 2.0 SUBMERSIBLE PUMP		Equipment Decon.: 3 BUCKET METHOD, ALCONOX
WELL INFO	Casing I.D. (in) [a]: 4"	Unit Casing Volume (gal/lin ft) [b]: 0.65	Initial Depth to Water (ft) [c]: ~~30~~ 26.23' BTOC
	Total Well Depth (ft) [d]: 42.8' BTOC	Water Column Thickness (ft) [d-c]: 16.57'	Well Volume (gal) [[d-c] x b]: 10.77 GAL
	Ground Condition of Well: SOFT		Remarks:

CASING INFO											
Casing I.D. (in) [a]:		1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (gal/lin ft) [b]:		0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pH	Conductivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mL/L)	ORP ~~Radiation~~ (mV)	Remarks (odor, clarity, etc.)
06-21-2021		PUMP											DRILLERS DEV.
06-22-2021		PUMP		~30 GAL									
06-23-2021	0705	PUMP	33.86 BGS	~~0~~m	1050 mL/min	20.3	6.69	2.70	1.75	>1100		114.8	HDR DEV.
↓	0710	PUMP	—		" "	20.7	6.67	2.20	3.82	283		114.3	SURGE
↓	0715	PUMP	DRY	~35 GAL	" "								
06-24-21	1505	PUMP	33.80 BTOC			25.5	7.07	2.96	1.38	>1100		122.0	
	1510	PUMP	35.17			25.8	6.68	2.94	0.65	849		117.1	
	1515		35.36			27.6	6.66	2.89	0.65	597		116.7	
↓	1520		35.60			29.2	6.74	2.86	0.80	248		118.3	
	1525		35.89			29.4	6.77	2.80	0.99	207		120.1	
	1530		36.08			29.6	6.80	2.73	1.26	135		122.4	

Development Criteria: 1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND 4) remove water added during drilling and construction

MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: LHAAP 18/24	LocID: 1824DPTMW5
	Project Name: Longhorn Army Ammunition Plant	Project #:

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pH	Conduc-tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mg/L)	ORP ~~Radiation~~ ( )	Remarks (odor, clarity, etc.)
06-24-21	1535	Pump	36.27			29.4	6.85	2.61	1.98	112		123.6	
	1540		36.69			29.2	6.89	2.36	2.34	55.1		125.5	
	1545		36.89			29.9	6.92	2.19	3.71	73.4		127.9	
	1550		37.10			30.3	6.95	2.07	3.92	81.7		131.6	
	1555		37.17			31.1	6.98	1.98	3.92	84.6		132.2	
	1600		37.32			31.0	7.01	1.92	4.19	85.3		132.9	
	1605		37.58			30.9	7.03	1.89	4.54	87.1		134.3	
	1610		37.94			31.4	7.01	1.81	4.66	98.6		138.6	
	1615		38.02			31.7	6.99	1.76	4.79	101		140.2	SURGE
	1620		~~38~~.41			30.2	6.96	1.70	4.82	130		137.6	
	1625		39.08			29.1	6.95	1.68	4.86	141		135.1	
	1630		39.42			27.9	6.92	1.67	4.93	162		133.3	
06-25-21	0725		36.86			21.2	7.61	2.92	1.71	372		114.9	
	0730		37.14			23.3	6.75	3.00	0.97	234		112.1	
	0735		37.31			23.4	6.74	2.98	0.94	215		111.4	
	0740		37.62			23.9	6.75	2.90	0.97	196		111.5	
	0745		37.70			24.8	6.75	2.89	1.20	123		111.5	
	0750		37.89			24.9	6.76	2.83	1.49	92.9		113.1	
	0755		38.14			25.1	6.84	2.69	2.69	~~89.8~~ 98.2		114.6	
	0800		38.32			25.6	6.90	2.44	3.33	~~115.5~~ 109		115.5	

Development Criteria: 1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND 4) remove water added during drilling and construction

00191262

MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: LHAAP 18/24	LocID: 1824DPTMW05
	Project Name: Longhorn Army Ammunition Plant	Project #:

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pH	Conductivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mg/L)	ORP Radiation ( )	Remarks (odor, clarity, etc.)
	0805		38.40			25.8	6.93	2.31	3.86	128		115.9	
	0810		38.60			25.9	6.97	2.10	4.04	169		116.5	
	0815		38.74			26.1	7.01	2.06	3.92	170		116.0	
	0820		38.82			26.3	7.02	2.02	4.00	168		116.3	
	0825		38.99			26.6	7.04	1.99	4.05	160		116.7	
	0830		39.28			26.9	7.05	1.94	4.19	152		117.2	
	0835		39.34			27.4	7.06	1.90	4.26	143		117.7	
	0840		39.42			27.6	7.06	1.89	4.25	138		118.1	
	0845		39.57			27.6	7.06	1.87	4.22	131		119.0	
	0850		39.63			27.9	7.06	1.87	4.23	122		119.2	
	0855		39.74			28.2	7.06	1.87	4.22	119		119.3	
	0900		39.86			28.3	7.06	1.88	4.23	114		119.5	
	0905		40.10			28.5	7.03	1.88	4.29	106		120.6	
	0910		40.21			28.3	7.02	1.90	4.36	99.4		120.9	
	0915		40.29			28.1	7.00	1.92	4.43	94.7		122.4	
	0920		40.36			28.6	6.99	1.94	4.32	90.6		121.9	
	0925		40.51			29.1	6.99	1.95	4.29	87.9		121.6	
	0930		40.68			29.5	6.98	1.96	4.11	85.8		120.8	
	0935		40.81			29.7	6.96	1.99	4.04	84.2		121.9	
	0940		40.96			29.8	6.95	2.01	3.98	83.9		123.5	

Development Criteria: 1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND 4) remove water added during drilling and construction

00191262

MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: LHAAP 18/24	LocID: 1824DRTMW5
	Project Name: Longhorn Army Ammunition Plant	Project #:

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pH	Conduc-tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mg/L)	ORP Radiation (mV)	Remarks (odor, clarity, etc.)
	0945		41.10			29.9	6.95	2.03	3.96	83.6		124.9	
	0950		41.33			30.4	6.95	2.05	3.88	81.2		125.4	
	0955		41.43			30.9	6.86	2.09	3.71	80.9		128.6	
	1000		41.78			31.0	6.77	2.11	3.23	84.7		131.8	
	1005		41.91			32.0	6.76	2.12	3.19	85.3		132.1	
	1010		42.10			31.9	6.76	2.13	3.10	89.2		134.3	
	1015		42.61			32.1	6.76	2.14	3.08	91.8		135.1	
	1020		42.92	~356AL		32.3	6.76	2.16	3.07	96.9		136.3	
	1025		43.10										DRY

Development Criteria: 1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND 4) remove water added during drilling and construction

00191261

MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: LHAAP 18/24	LocID: 1824DPTMW6	Date: 06/22/2021
	Project Name: Longhorn Army Ammunition Plant	Project #:	Recorded By: JM Checked By:
EQUIPMENT	Water Quality Meter Type/ID #: YSI PRO PLUS		Water Level Indicator Type/ID #: HERON DIPPER-T
	Equipment Group:		Equpment Group:
	Development Equipment: TORNADO 2.0 SUBMERSIBLE PUMP		Equipment Decon.: 3 BUCKETS, ALCONOX
WELL INFO	Casing I.D. (in) [a]: 1824DPTMW6	Unit Casing Volume (gal/lin ft) [b]: 0.65	Initial Depth to Water (ft) [c]: 4.87' BGS
	Total Well Depth (ft) [d]: 49.15' BGS	Water Column Thickness (ft) [d-c]: 44.28'	Well Volume (gal) [(d-c] x b]: 28.78 GAL
	Ground Condition of Well: SOFT, ALOT OF SEDIMENT		Remarks:

CASING INFO											
Casing I.D. (in) [a]:	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (gal/lin ft) [b]:	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level ~~(Floor BGS~~	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pH	Conductivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mL/L)	ORP ~~Radiation~~ (mV)	Remarks (odor, clarity, etc.)
06-22-2021	1200	Pump	4.87 BGS	0									VERY TURBID
06-22-2021	1340	Pump		~65 GAL									CLEARING UP
06-22-2021	1500	Pump	~~5.00 BGS~~ 5.87	~65 GAL	600 mL/MIN	20.0	6.85	1.32	0.19	43.8		99.0	
	1505	Pump	7.76		600 mL/MIN	19.9	6.47	1.26	0.13	31.3		95.9	
	1510	Pump	8.18	~70 GAL		19.9	6.41	1.28	0.13	30.7		98.6	
	1515	Pump	9.25			19.9	6.34	1.28	0.12	20.9		99.0	
	1520	Pump	9.38	~75 GAL		20.0	6.26	1.33	0.08	17.8		103.6	
	1525	Pump	9.50			20.0	6.27	1.34	0.08	15.3		103.9	
	1530	Pump	9.56	~80 GAL		20.0	6.28	1.34	0.06	8.74		104.8	
	1535	Pump	9.40			20.0	6.28	1.34	0.05	4.81		105.6	
	1540	Pump	9.42	~85 GAL		20.0	6.26	1.34	0.05	2.73		106.1	

Development Criteria: 1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND 4) remove water added during drilling and construction

Attachment 4. Low-flow Sample Data Forms

LDR

Low - Flow Groundwater Sampling Data Sheet

Well ID : 1824DPTMW1	Samplers : E. North & J. Moorman
Date : 06/25/2021	Project : LHAAP 18/24

Equipment

Pump : Geotech Portable Bladder Pump	
Water Level Meter : Heron Dipper-T	
Parameter Meter : YSI PRO PLUS	
Turbidity Meter: HACH 2100 Q	

Casing Diameter :	Initial Water Level :	Final Water Level :	Total Well Depth :	Purge Volume (Total):
4"	18.85' btoc	21.95' BTOC	36.10' BTOC	9.0 L

Sample ID : 1824DPTMW1	**Analyses :** VOCs, Perchlorate	**# of Bottles**
QC Samples: FD FS RB MS/MSD	Analyses:	—
Full Sample: (Y) N		4
Partial Sample: Y (N)	Analyses Collected:	—

Well Conditions, Remarks

Metals Filtered : Y / N

Time	Depth to Water (ft)	Pumping Rate (L/min)	Purge Volume (L)	Temp. (°C)	Conductivity (uS/cm)	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1330	19.25	0.3 L/min	~~0.5~~	21.7	6.87	4.23	2.12	264.2	2.13
1335	19.60		1.5 L	21.2	6.84	4.69	1.77	229.8	3.78
1340	20.00		3.0 L	21.3	6.83	5.12	1.77	204.3	2.64
1345	20.60		4.5 L	21.0	6.79	5.30	1.77	190.9	2.00
1350	20.92		6.0 L	21.1	6.79	5.35	1.75	187.7	2.45
1355	21.46		7.5 L	21.2	6.79	5.47	1.77	180.3	2.21
1400	21.95		9.0 L	21.0	6.74	5.35	1.79	178.1	2.16
Stabilization Criteria :				± 1°	± 10%	± 0.1	± 10%	± 10	± 10% and under 50 NTUs

Sample Time : 1400	Sampler's Signature:	Checked by :

LDR

Low - Flow Groundwater Sampling Data Sheet

Well ID: 1824DPTMW02	Samplers: JM & EN
Date: 06/28/2021	Project: LHAAP 18/24

Equipment

Pump: GEOTECH PORTABLE BLADDER PUMP

Water Level Meter: HERON DIPPER-T

Parameter Meter: YSI PRO PLUS

Turbidity Meter: HACH 2100 Q

Casing Diameter:	Initial Water Level:	Final Water Level:	Total Well Depth:	Purge Volume (Total):
4"	28.13' BTOC	30.93' BTOC	42.72' BTOC	6.75L

		# of Bottles
Sample ID: 1824DPTMW02	Analyses:	—
QC Samples: FD FS RB MS/MSD	Analyses:	
Full Sample: (Y) N	PERCHLORATE, VOCs	4
Partial Sample: Y N	Analyses Collected:	—

Well Conditions, Remarks

Metals Filtered: Y / N

Time	Depth to Water (ft)	Pumping Rate (L/min)	Purge Volume (L)	Temp. (°C)	Conductivity (uS/cm)	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1235	28.21	0.15L/min	0	24.9	4.72	3.86	5.52	312.1	3.36
1240	28.46		0.75	21.2	4.70	4.58	4.32	259.0	1.97
1245	28.69		1.50	21.2	4.68	4.97	3.95	231.8	2.26
1250	28.99		2.25	21.2	4.67	5.31	3.90	209.4	1.95
1255	29.44		3.00	20.9	4.65	5.68	4.07	187.9	2.30
1300	29.63		3.75	21.2	4.65	5.94	3.84	173.0	2.34
1305	29.96		4.50	21.3	4.65	6.17	3.96	160.9	2.92
1310	30.20		5.25	21.7	4.65	6.29	3.85	154.0	2.27
1315	30.46		6.00	21.3	4.65	6.36	3.94	150.1	2.22
1320	30.93		6.75	21.2	4.65	6.39	3.96	148.2	1.86
Stabilization Criteria:				±1°	±10%	±0.1	±10%	±10	±10% and under 50 NTUs

Sample Time: 1325 | Sampler's Signature: J. Moore | Checked by:

LDR

Low - Flow Groundwater Sampling Data Sheet

Well ID: 1824DPT MW3	Samplers: JM & EN
Date: 06/30/2021	Project: LHAAP 18/24

Equipment

Pump: GEOTECH PORTABLE BLADDER PUMP				
Water Level Meter: HERON DIPPER-T				
Parameter Meter: YSI PRO PLUS				
Turbidity Meter: HACH 2100 Q				
Casing Diameter: 4"	Initial Water Level: 35.90' BTOC	Final Water Level: 36.90' BTOC	Total Well Depth: 40.77' BTOC	Purge Volume (Total): 4.0L

Sample ID: 1824DPT MW3	Analyses:	# of Bottles
QC Samples: FD FS RB MS/MSD	Analyses:	
Full Sample: (Y) N		4
Partial Sample: Y (N)	Analyses Collected:	

Well Conditions, Remarks

Metals Filtered: Y / N

Time	Depth to Water (ft)	Pumping Rate (L/min)	Purge Volume (L)	Temp. (°C)	Conductivity (uS/cm)	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1030	36.04	0.1	0	22.9	1.07	3.77	6.95	300.9	12.7
1035	36.07		0.5	22.1	1.08	4.51	3.95	250.7	13.4
1040	36.10		1.0	22.3	1.07	4.95	4.07	222.8	13.0
1045	36.30		1.5	22.2	1.08	5.20	3.95	209.1	11.2
1050	36.42		2.0	21.9	1.08	5.50	3.81	191.5	10.8
1055	36.70		2.5	22.1	1.08	5.87	3.94	171.2	10.5
1100	36.78		3.0	22.4	1.08	6.11	3.86	158.3	10.3
1105	36.81		3.5	22.5	1.08	6.18	3.87	154.9	9.99
1110	36.90		4.0	22.6	1.08	6.20	3.88	150.3	9.98
Stabilization Criteria:				±1°	±10%	±0.1	±10%	±10	± 10% and under 50 NTUs

Sample Time: 1115	Sampler's Signature:	Checked by:

Page : 1/1

Low - Flow Groundwater Sampling Data Sheet

Well ID : 1824DPTMW04	Samplers : JM & EN
Date : 06/28/2021	Project : LHAAP 18/24

Equipment

Pump : GEOTECH PORTABLE BLADDER PUMP	
Water Level Meter : HERON DIPPER-T	
Parameter Meter : YSI PRO PLUS	
Turbidity Meter: HACH 2100Q	

Casing Diameter :	Initial Water Level :	Final Water Level :	Total Well Depth :	Purge Volume (Total):
4"	26.30' BTOC	27.76		2.50 L

Sample ID :	Analyses :	# of Bottles
QC Samples: FD FS RB MS/MSD	Analyses: —	—
Full Sample: (Y) N	PERCHLORATE, VOCs	4
Partial Sample: Y (N)	Analyses Collected: —	—

Well Conditions, Remarks

Metals Filtered : Y / N

Time	Depth to Water (ft)	Pumping Rate (L/min)	Purge Volume (L)	Temp. (°C)	Conductivity (uS/cm)	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1355	26.50	0.1 L/min	0	22.4	6.83	4.08	6.66	140.0	11.2
1400	26.63		0.5	22.1	6.81	6.60	3.96	122.3	7.77
1405	27.08		1.0	22.1	6.80	6.54	3.73	119.6	5.24
1410	27.30		1.5	21.8	6.80	6.53	3.70	119.4	9.67
1415	27.55		2.0	21.6	6.79	6.51	3.71	119.3	7.74
1420	27.76		2.5	21.6	6.80	6.51	3.73	119.6	1.80
Stabilization Criteria :				± 1°	± 10%	± 0.1	± 10%	± 10	± 10% and under 50 NTUs

Sample Time : 1425	Sampler's Signature: J. Morrow	Checked by :

LDR

Low - Flow Groundwater Sampling Data Sheet

Well ID : 1824DPTMW5	Samplers : JM
Date : 06-28-2021	Project : LHAAP 18/24

Equipment

Pump : GEOTECH PORTABLE BLADDER PUMP	
Water Level Meter : HERON DIPPER-T	
Parameter Meter : YSI PRO PLUS	
Turbidity Meter: HACH 2100 Q	

Casing Diameter :	Initial Water Level :	Final Water Level :	Total Well Depth :	Purge Volume (Total):
4"	26.23' BTOC	28.18' BTOC		3.0 L

Sample ID : 1824DPTMW05	Analyses :	# of Bottles
QC Samples: FD FS RB MS/MSD	Analyses: ~~PERCHLORATE, VOCs, DM~~	
Full Sample: (Y) N	PERCHLORATE, VOCs	4
Partial Sample: Y (N)	Analyses Collected: —	

Well Conditions, Remarks

Metals Filtered : Y / N

Time	Depth to Water (ft)	Pumping Rate (L/min)	Purge Volume (L)	Temp. (°C)	Conductivity (uS/cm)	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1020	26.40	0.1L/min	0L	23.4	2.89	6.90	3.57	113.5	13.6
1025	26.69		0.5L	23.4	3.04	6.75	2.37	113.9	7.05
1030	27.14		1.0L	23.3	2.97	6.70	2.25	114.6	7.50
1035	27.50		1.5L	23.1	2.92	6.70	1.52	115.2	5.58
1040	27.68		2.0L	23.3	2.88	6.70	1.60	115.4	5.33
1045	27.80		2.5L	23.8	2.84	6.72	1.61	115.0	4.71
1050	28.18		3.0L	23.7	2.79	6.73	1.68	115.8	4.64
Stabilization Criteria :				±1°	±10%	±0.1	±10%	±10	±10% and under 50 NTUs

Sample Time : 1055	Sampler's Signature: John Mooney	Checked by :

LDR

Low - Flow Groundwater Sampling Data Sheet

Well ID: 1824DPTMW06	Samplers: JM & EN
Date: 06/29/2021	Project: LHAAP 18/24

Equipment

Pump: GEOTECH PORTABLE BLADDER PUMP

Water Level Meter: HERON DIPPER-T

Parameter Meter: YSI PRO PLUS

Turbidity Meter: HACH 2100 Q

Casing Diameter:	Initial Water Level:	Final Water Level:	Total Well Depth:	Purge Volume (Total):
4"	8.27' BTOC	8.73' BTOC	52.15' BTOC	9.5 L

Sample ID:	Analyses:	# of Bottles
QC Samples: (FD) FS RB (MS/MSD)	Analyses:	18
Full Sample: (Y) N		6
Partial Sample: Y (N)	Analyses Collected:	

DUP-08
TB-04

Well Conditions, Remarks

Metals Filtered: Y / N

Time	Depth to Water (ft)	Pumping Rate (L/min)	Purge Volume (L)	Temp. (°C)	Conductivity (uS/cm)	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1225	8.35	0.1	0	33.2	1.10	3.82	2.28	276.7	65.8
1230	8.40		0.5	28.6	1.37	4.77	1.34	215.0	18.5
1235	8.41		1.0	27.1	1.50	5.36	1.09	190.1	32.8
1240	8.43		1.5	27.8	1.50	5.50	0.85	174.2	24.9
1245	8.41		2.0	27.9	1.49	5.62	0.82	168.0	18.9
1250	8.41		2.5	28.0	1.48	5.62	0.76	168.7	18.3
1255	8.41		3.0	28.5	1.46	5.70	0.64	165.2	16.9
1300	8.42		3.5	28.7	1.47	5.77	0.61	164.0	18.3
1306	8.42		4.0	28.4	1.46	5.21	0.61	171.2	20.6
1310	8.43		4.5	28.2	1.45	4.19	0.62	170.5	23.4
1315	8.43		5.0	27.5	1.44	5.45	0.54	170.4	24.5
1320	8.44		5.5	24.1	1.41	5.68	2.30	129.4	28.6
1325	8.64		6.0	24.1	1.30	5.52	0.99	142.7	16.5
1330	8.68		6.5	24.1	1.30	5.46	0.69	146.4	17.2
1335	8.75		7.0	24.1	1.30	5.53	0.56	145.0	12.4
Stabilization Criteria:				±1°	±10%	±0.1	±10%	±10	±10% and under 50 NTUs

INCREASE FLOW

Sample Time: 1405	Sampler's Signature:	Checked by:

LDR

Low - Flow Groundwater Sampling Data Sheet

Well ID : 1824DPTMW6			Samplers : JM & EN	
Date : 06/29/2021			Project : LHAAP 18/24	
Equipment				
Pump : GEOTECH PORTABLE BLADDER PUMP				
Water Level Meter : HERON DIPPER-T				
Parameter Meter : YSI PRO PLUS				
Turbidity Meter: HACH 2100Q				
Casing Diameter : 4"	Initial Water Level : 8.27' BTOC	Final Water Level : 8.73' BTOC	Total Well Depth : 52.15' BTOC	Purge Volume (Total): 9.5L

Sample ID :	**Analyses :**	**# of Bottles**
QC Samples: (FD) FS RB (MS/MSD)	Analyses:	18
Full Sample: (Y) N		6
Partial Sample: Y (N)	Analyses Collected:	

Well Conditions, Remarks

Metals Filtered : Y / N

Time	Depth to Water (ft)	Pumping Rate (L/min)	Purge Volume (L)	Temp. (°C)	Conductivity (uS/cm)	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1340	8.74		7.5	24.3	1.30	5.60	0.51	141.4	13.7
1345	8.74		8.0	24.2	1.30	5.66	0.24	140.7	11.2
1350	8.74		8.5	24.1	1.30	5.59	0.23	143.4	10.8
1355	8.73		9.0	24.2	1.30	5.63	0.23	145.2	9.68
1400	8.73		9.5	23.5	1.30	5.61	0.22	148.0	9.52
Stabilization Criteria :				± 1°	± 10%	± 0.1	± 10%	± 10	± 10% and under 50 NTUs

Sample Time : 1405	Sampler's Signature:	Checked by :

Attachment 5. DPT Temporary Well and Monitoring Well Summary

DPT Temporary Well and Monitoring Well Summary

Monitoring Wells (1824DPTMW1 - 1824DPTMW6)								
Well ID	Zone	Northing[1]	Easting[1]	TOC Elevation (ft MSL)	Ground Surface Elevation (ft MSL)	Well Depth (ft btoc)	Water Level (ft btoc)	Water Elevation (TOC ft AMSL/Ground Elevation ft AMSL)
1824DPTM	Wilcox Fm	6953865.251	3315957.29	180.351	1824DPTMW06	52.15	8.27	172.081
ECL1000		6953864.834	3315954.595		177.089			
ECL1000		6953868.101	3315956.871		177.06			
ECL1000		6953865.755	3315960.024		177.124			
ECL1000		6953862.497	3315957.726		177.124			
mean					177.09925			168.82925
1824DPTM	Shallow	6953389.874	3316381.081	197.573	1824DPTMW05	42.8	26.23	171.343
ECL1000		6953389.782	3316383.843		194.104			
ECL1000		6953387.117	3316381.013		194.027			
ECL1000		6953389.94	3316378.325		193.989			
ECL1000		6953392.594	3316381.16		194.089			
mean					194.05225			167.82225
1824DPTM	Shallow	6954303.382	3317393.075	197.903	1824DPTMW02	42.72	28.13	169.773
ECL1000		6954300.634	3317393.426		194.803			
ECL1000		6954303.152	3317390.484		194.921			
ECL1000		6954306.201	3317392.962		194.956			
ECL1000		6954303.66	3317395.92		194.951			
mean					194.90775			166.77775
1824DPTM	Shallow	6954052.499	3317771.698	196.254	1824DPTMW04	43.38	26.3	169.954
ECL1000		6954052.876	3317774.381		192.753			
ECL1000		6954049.713	3317771.883		192.914			
ECL1000		6954052.289	3317768.849		193.028			
ECL1000		6954055.239	3317771.268		192.966			
mean					192.91525			166.61525
1824DPTM	Shallow	6954712.546	3317318.031	197.299	1824DPTMW03	40.77	35.9	161.399
ECL1001		6954709.812	3317318.403		193.935			
ECL1001		6954712.073	3317315.186		193.98			
ECL1001		6954715.287	3317317.572		193.835			
ECL1001		6954713.006	3317320.65		193.783			
mean					193.88325			157.98325
Monitoring Wells (1824DPTMW1 - 1824DPTMW6)								
Well ID	Zone	Northing[1]	Easting[1]	TOC Elevation (ft MSL)	Ground Surface Elevation (ft MSL)	Well Depth (ft btoc)	Water Level (ft btoc)	Water Elevation (TOC ft AMSL/Ground Elevation ft AMSL)
1824DPTM	Shallow	6954778.092	3317981.444		1824DPTMW01	36.1	18.85	168.15
ECL1001		6954778.092	3317981.444		184.991			
ECL1001		6954777.322	3317985.382		184.937			
ECL1001		6954773.586	3317984.779		184.944			
ECL1001+		6954774.285	3317980.943		184.952			
mean					184.956			166.106

DPT Temporary Well and Monitoring Well Summary

Monitoring Wells (Existing Site Wells)[3]								
Well ID	Zone	Northing[1]	Easting[1]	TOC Elevation (ft MSL)	Ground Surface Elevation (ft MSL)	Well Depth (ft btoc)	Water Level (ft btoc)	Water Elevation (TOC ft AMSL/Ground Elevation ft AMSL)
18CPTMW18		6954928.07	3317820.56		194.53		25.5	169.03
18WW17		6954522	3317675		193.9		NA	NA
109		6954241.26	3317108.75		197.02		26.02	171
MW-21		6953989.18	3317301.36		198.7		28.33	170.37

Notes:

ECL 1000 = Concrete slab corner elevation shots

1 - NAD83 northing and easting

2 - NAVD88 elevation

3 - Bhate GWTP Report 2nd Quarter, 2021

Attachment 6. Data Validation Report

DATA VALIDATION REPORT

Volatile Organic Compounds (VOCs) by USEPA SW-846 Method 8260B
Perchlorate by USEPA SW-846 Method 6850
1,4-Dioxane by USEPA SW-846 Method 8270C-SIM

Project: USACE Longhorn Army Ammunition Plant (LHAAP), Texas
Soils and Groundwaters – June 2021 – Site 18/24
Project/Task Number: 10246337 - 7
Sample Data Package: M1F0904, M1F1405, M1G0158, M1G0160
Laboratory: Microbac Labs, Marietta, Ohio
Sample Matrix: Groundwater and Soil
Sampling Dates: 10-30 June 2021
Validation Guidelines: -Project QAPP *(Final Quality Assurance Project Plan for Longhorn Army Ammunition Plant, Karnack, Texas [July 2014]*);
-United States Environmental Protection Agency (USEPA) *Test Methods for Evaluating Solid Waste, Physical/Chemical Meth*ods, *3rd edition* (SW-846);
-US DoD *General Data Validation Guidelines* (Environmental Data Quality Workgroup [EDQW], February 09, 2018)*;*
-USACE *Environmental Quality Guidance for Evaluating Performance-Based Chemical Data* (USACE, EM 200-1-10, June 30, 2005); and
-professional judgment
Validation Level: Stage 2BVM (100% of data), Stage 3VM (10% of data)
Data Reviewer: Lynn K. Lutz, HDR

Sample ID	Lab ID	Date Collected	Matrix	VOCs	Perchlorate	1,4-Dioxane
1824DPT26	M1F0904-01	11-June-2021	Soil	X	X	
1824DPT27	M1F0904-02	11-June-2021	Soil	X	X	
1824DPT27A	M1F0904-08	11-June-2021	Soil	X	X	
1824DPT28	M1F0904-03	11-June-2021	Soil	X	X	
1824DPT29	M1F0904-04	11-June-2021	Soil	X	X	
1824DPT29A	M1F0904-09	10-June-2021	Soil	X	X	
1824DPT30	M1F0904-05	10-June-2021	Soil	X	X	
1824DPT30 MS	M1F0904-05 MS	10-June-2021	Soil	X	X	
1824DPT30 MSD	M1F0904-05 MSD	10-June-2021	Soil	X	X	
1824DPT31	M1F0904-06	10-June-2021	Soil	X	X	
DUP-05	M1F0904-07	10-June-2021	Soil	X	X	
1824DPT26	M1F1405-01	16-June-2021	GW	X	X	
1824DPT27	M1F1405-02	16-June-2021	GW	X	X	
1824DPT27A	M1F1405-03	16-June-2021	GW	X	X	
1824DPT28	M1F1405-04	16-June-2021	GW	X	X	
1824DPT29	M1F0904-26	12-June-2021	GW	X	X	
1824DPT29A	M1F0904-24	12-June-2021	GW	X	X	
1824DPT30	M1F0904-21	12-June-2021	GW	X	X	
1824DPT31	M1F0904-22	12-June-2021	GW	X	X	
1824DPT31 MS	M1F0904-22 MS	12-June-2021	GW	X	X	
1824DPT31 MSD	M1F0904-22 MSD	12-June-2021	GW	X	X	
1824DPT32	M1F0904-10	12-June-2021	GW	X	X	
1824DPT33	M1F0904-11	12-June-2021	GW	X	X	
1824DPT34	M1F0904-12	12-June-2021	GW	X	X	
1824DPT35	M1F0904-13	12-June-2021	GW	X	X	

Sample ID	Lab ID	Date Collected	Matrix	VOCs	Perchlorate	1,4-Dioxane
1824DPT36	M1F0904-15	12-June-2021	GW	X	X	
1824DPT37	M1F0904-20	12-June-2021	GW	X	X	
1824DPT38	M1F0904-14	12-June-2021	GW	X	X	
1824DPT39	M1F0904-16	12-June-2021	GW	X	X	
1824DPT40	M1F0904-17	12-June-2021	GW	X	X	
1824DPT41	M1F0904-19	12-June-2021	GW	X	X	
1824DPT42	M1F0904-18	12-June-2021	GW	X	X	
DUP-06	M1F0904-23	12-June-2021	GW	X	X	
DUP-07	M1F0904-25	12-June-2021	GW	X	X	
1824DPTMW01	M1G0158-01	25-June-2021	GW	X	X	
1824DPTMW02	M1G0158-03	28-June-2021	GW	X	X	
1824DPTMW03	M1G0158-07	30-June-2021	GW	X	X	
1824DPTMW04	M1G0158-04	28-June-2021	GW	X	X	
1824DPTMW05	M1G0158-02	28-June-2021	GW	X	X	
1824DPTMW06	M1G0158-05	29-June-2021	GW	X	X	X
1824DPTMW06 MS	M1G0158-05 MS	29-June-2021	GW	X	X	X
1824DPTMW06 MSD	M1G0158-05 MSD	29-June-2021	GW	X	X	X
DUP-08	M1G0158-06	29-June-2021	GW	X	X	X
TB-01	M1F0904-28	10-June-2021	QC Water	X		
TB-02	M1F0904-29	10-June-2021	QC Water	X		
TB-03	M1F1405-05	16-June-2021	QC Water	X		
TB-04	M1G0158-08	25-June-2021	QC Water	X		
EB-05	M1F0904-27	10-June-2021	QC Water	X	X	
TCLP-01	M1G0160-01	Hazard analyses				

The TCLP-01 IDW sample results were not validated.

SUMMARY

One hundred percent of the data underwent Stage 2BVM level validation. Ten percent of the data underwent Stage 3VM level validation.

Laboratory data were acceptable with qualification as noted below. No data were rejected. Completeness was 100%, which met the goal of 85% for the project.

I. SAMPLE RECEIPT / CHAIN OF CUSTODY

Samples were received at -0.70°C to 1.50°C, within the correct temperature range of 0-6°C. The lab did not note samples received below 0°C had freezing issues. The chains of custody (COCs) were filled out and signed. No qualification was required.

II. HOLDING TIMES AND PRESERVATION

Holding time and preservation criteria were generally met except as discussed below.

VOCs: All soil samples were frozen until shipping, at which time they were shipped on wet ice.

Trichlorotrifluoroethane in GW samples 1824DPT33, 1824DPT34, and DUP-06, and trichloroethene in GW samples 1824DPT40 and 1824DPT41 were analyzed at dilution five days past the 14 day holding time, and the analytes reported from these dilutions have been qualified as estimated (J).

All GW samples reported in data package M1F14095 except the trip blank were analyzed one day past the 14 day holding time. All results in these samples (1824DPT26, 1824DPT27, 1824DPT27A, and 1824DPT28) have been qualified as estimated (J) or non-detect estimated (UJ).

Perchlorate: Samples reported in data package M1G0158 were analyzed one to six days past the 28 day holding time. The lab noted in the case narrative that the initial analyses were performed within holding time but the samples required dilution due to high perchlorate concentrations. Results for these samples (1824DPTMW01 through 1824DPTMW06 and DUP-08) have been qualified as estimated (J).

Groundwater samples were filtered in the field to remove degrading microbes.

1,4-Dioxane: Samples were extracted within seven days of collection and analyzed within 40 days of extraction. No qualification was required.

III. INSTRUMENT PERFORMANCE

VOCs: GC/MS BFB tuning criteria were met. Sample analysis began within 12 hours of BFB analysis. Several closing CCVs were analyzed past the 12-hour period. No qualification was required.

Perchlorate: Not applicable.

1,4-Dioxane: GC/MS DFTPP tuning criteria were met. Sample analysis began within 12 hours of DFTPP analysis.. No qualification was required.

IV. INSTRUMENT CALIBRATION

INITIAL CALIBRATIONS

VOCs: The calibration curve included a standard at or below the LOQ. Calibration requirements were met. No qualification was required.

Perchlorate: The calibration curve included a standard at or below the LOQ. Individual calibration standards quantitated to within 20% of true value using the calibration curve. Calibration requirements were met. No qualification was required.

1,4-Dioxane: The calibration curve included a standard at or below the LOQ. Calibration requirements were met. No qualification was required.

SECOND SOURCE STANDARDS (ICV)

VOCs: Some %D values were above the required limit of 20%, and associated sample results required qualification as shown in the table below.

ICV	Analyte	%D	Associated Samples	Qualifier
B1F1117	Bromomethane Dichlorodifluoromethane Vinyl acetate	+28% +65% +89%	All soils	UJ UJ UJ
B1F1692	Vinyl chloride Acetone Dichlorodifluoromethane	-25% -20.1% +20.4%	--	None – not reported from this batch
B1G0267 B1G0340	Vinyl acetate	+20.8%	1824DPTMW01 1824DPTMW01 1824DPTMW01 1824DPTMW01 1824DPTMW01 1824DPTMW01 DUP-08 TB-04	UJ

Perchlorate: All analytes had %D values less than 15%. No qualification was required.

1,4-Dioxane: The %Ds were less than 20%. No qualification was required.

CONTINUING CALIBRATIONS

VOCs: Several analytes had %D values above the 20% limit (for opening CCVs) or the 50% limit (for closing CCVs) and associated samples were qualified as noted in the table.

CCV	Analyte	%D	Associated Samples	Qualifier
B1F1117	Bromomethane Dichlorodifluoromethane Vinyl acetate	+47% +57% +107%	--	None – All ND None – All ND None – All ND
B1F1117 Closing	Vinyl acetate	+89%	--	None – All ND
B1F1335	Chloroethane	+63.5%	--	None – All ND
B1F1335 Closing	Chloroethane	+56%	--	None – All ND
B1F1436 Closing	Vinyl acetate	-53%	M1F0904-10 through M1F0904-26	UJ
B1F1692	Dichlorodifluoromethane	+36%	--	None reported
B1G0057	Chloroethane	+69%	--	None reported
B1G0057 Closing	Chloroethane	+62%	--	None reported
B1F1679	Chloroethane	+56%	--	None – All ND
B1G0057	Chloroethane	+67%	--	None – All ND
B1G0057 Close	Chloroethane	+62%	--	None – All ND
B1G0267	Trichlorofluoromethane	+48%	--	None – All ND
B1G0267 Closing	Trichlorofluoromethane	+117%	--	None – All ND
	Vinyl acetate	-73%	1824DPTMW01 1824DPTMW02 1824DPTMW03 1824DPTMW04	UJ UJ UJ UJ
B1G0340	Trichlorofluoromethane	+114%	--	None – All ND

CCV	Analyte	%D	Associated Samples	Qualifier
B1G0340 Closing	Trichlorofluoromethane	+122%	--	None – All ND
	Vinyl acetate	-89.5%	1824DPTMW03 1824DPTMW04 DUP-08	UJ UJ UJ
B1G1358	Seven analytes	-20.1% to +53%	--	No results reported
B1G1358 Closing	Chloroethane	+81%	--	No results reported

Perchlorate: All results had %D values less than 15%. No qualification was required.

1,4-Dioxane: The %Ds were less than 20%. No qualification was required.

V. BLANKS

METHOD BLANKS (MB)

Target analytes were not detected in the method blanks except as noted below.

VOCs: A trace level of trichloroethene, 0.400 µg/L, was detected in one MB in data package M1F0904. Sample results were greater than 20 µg/L, and no qualification was required.

Acetone was detected at a trace level in one MB in data package M1G0158. No sample results were associated with this MB, and no qualification was required.

Perchlorate: Perchlorate was not detected in the MBs. No qualification was required.

1,4-Dioxane: 1,4-Dioxane was not detected in the MB. No qualification was required.

TRIP BLANKS (TB)

VOCs: VOCs were not detected in the trip blanks. No qualification was required.

Perchlorate: Not applicable.

1,4-Dioxane: Not applicable.

EQUIPMENT RINSE BLANKS (EB)

VOCs: VOCs were not detected in the EB. No qualification was required.

Perchlorate: Perchlorate was not detected in the EB. No qualification was required.

1,4-Dioxane: The EB was not analyzed for 1,4-dioxane.

VI. LABORATORY CONTROL SAMPLES (LCS)

VOCs: LCS and LCSD recoveries and relative percent differences (RPDs) were within control limits except for high recoveries of trichlorofluoromethane in several LCSs and high recoveries of bromomethane and 1,1,2,2-tetrachloroethane in one LCS/LCSD set, and one high RPD for

acetone. The associated sample results for these analytes were non-detect, and no qualification was required.

Perchlorate: LCS and LCSD recoveries and relative percent differences (RPDs) were within control limits. No qualification was required.

1,4-Dioxane: LCS and LCSD recoveries and relative percent differences (RPDs) were within control limits. No qualification was required.

VII. SURROGATES

All surrogate recoveries were within control limits except as noted below.

VOCs: Several surrogate recoveries in the samples were outside control limits, and samples required qualification as shown in the table below.

Sample ID	Surrogate	Recovery	Control Limit	Qualification
1824DPT31 (GW)	BFB	123%	85-114%	None – other surrogates OK
1824DPT36 (GW)	Toluene-d8	117%	89-112%	None – other surrogates OK
1824DPT39 (GW)	BFB Toluene-d8	133% 85.5%	85-114% 89-112%	Trichlorotrifluoroethane - J Trichloroethene - J
1824DPT33 (GW)	Toluene-d8	88.6%	89-112%	None – other surrogates OK

Perchlorate: Not applicable.

1,4-Dioxane: The recovery of the surrogate in sample DUP-08 at 147% was above the control limits of 20-129%. The 1,4-dioxane result in this sample has been qualified as estimated with a possible high bias (J+).

VIII. MATRIX SPIKE / MATRIX SPIKE DUPLICATE (MS/MSD)

VOCs: Samples 1824DPT30 (soil), 1824DPT31 (GW), and 1824DPTMW06 (GW) were designated on the COCs for MS/MSD analysis. Results are shown in the table below.

Parent Sample ID	Analyte	MS/MSD Result	Control Limits	Parent Sample Qualifier
1824DPT30 (soil)	1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 4-Chlorotoluene Bromobenzene 1,2,4-Trichlorobenzene 1,2,4-Trimethylbenzene Bromomethane Dichlorodifluoromethane Hexachlorobutadiene	OK, 73% OK, 72% OK, 72% OK, 70% OK, 76% RPD 24% OK, 74.9% OK, 145% 159%, 157% RPD 25%	78-121% 77-121% 75-120% 72-124% 78-121% RPD 20% 75-123% 53-143% 29-149% RPD 20%	UJ UJ UJ UJ UJ None – ND None None – ND None – ND None - ND
1824DPT31 (GW)	Trichloroethene 10 Analytes	-0.35%, 11% RPD >20%	79-123% 20%	J None - ND
1824DPTMW06 (GW)	1,1,2,2-Tetrachloroethane Chloroethane	OK, 124% 155%, OK	71-121% 60-138%	None – ND None – ND

	Trichloroethene Trichlorofluoromethane	OK, 67.5% 170%, 215%	79-123% 65-141%	J None - ND

Perchlorate: Samples 1824DPT30 (soil), 1824DPT31 (GW), and 1824DPTMW06 (GW) were designated on the COCs for MS/MSD analysis. The lab also spiked sample 1824DPT27 (GW) from this project. Results are shown in the table below.

Parent Sample ID	Analyte	MS/MSD Result	Control Limits	Parent Sample Qualifier
1824DPT30 (soil)	Perchlorate	Sample >4X spike, spike diluted out, RPD <15%	RPD 15%	None
1824DPT31 (GW)	Perchlorate	Sample >4X spike, spike diluted out, RPD <15%	RPD 15%	None
1824DPTMW06 (GW)	Perchlorate	OK, 120%	84-119%	J
1824DPT27 (GW)	Perchlorate	OK	--	None

1,4-Dioxane: The recoveries of 26% and 17% were below the control limits of 30-104%. The 1,4-dioxane result in the parent sample 1824DPTMW06 has been qualified as estimated (J).

IX. DUPLICATES

FIELD DUPLICATES

Field duplicate samples were collected as identified in the following table.

Parent Sample	Field Duplicate Sample	Matrix - Analysis
1824DPT31 (soil)	DUP-05	VOCs, Perchlorate
1824DPT31 (GW)	DUP-06	VOCs, Perchlorate
1824DPT29 (GW)	DUP-07	VOCs, Perchlorate
1824DPTMW06 (GW)	DUP-08	VOCs, Perchlorate, 1,4-Dioxane

RPDs were within control limits except as noted below.

VOCs: RPDs were within control limits. No qualification was required.

Perchlorate: Perchlorate was detected in 1824DPT31 (soil) at 783 µg/kg and in the FD DUP-05 at 1360 µg/kg, for an RPD of 54%, within the control limit of 75% as listed in the QAPP. Other parent / FD sample pairs also had RPDs within the control limit. No qualification was required.

1,4-Dioxane: The RPD of 14% was within the 20% control limit. No qualification was required.

LABORATORY DUPLICATES

VOCs: Not applicable.

Perchlorate: Lab duplicate analysis was not performed on any samples from this project.

1,4-Dioxane: Not applicable.

X. INTERNAL STANDARDS (ISTD)
All ISTD criteria were met except as noted below.

VOCs: All ISTD criteria were met. No qualification was required.

Perchlorate in GW: Internal standard areas and sample ion ratios were within required limits. No qualification was required.

1,4-Dioxane: All ISTD criteria were met. No qualification was required.

XI. LIMITS OF QUANTITATION (LOQs), LIMITS OF DETECTION (LODs), AND DETECTION LIMITS (DLs)
The LOQs should be at or below the project action limits (PALs) as listed in the QAPP.

VOCs: The LOQs were generally at or below the PALs listed in the QAPP. The table below shows the LOQs that were above PALs. The lab reported detections down to the DL. For these three analytes, the LOD and DL were also above the PALs, therefore it cannot be definitely determined that non-detect results were below the PALs.

Analyte	LOQ (µg/L)	LOD (µg/L)	DL (µg/L)	MCL (µg/L)	TCEQ GW-Ind MSC (µg/L)
1,2,3-Trichloropropane	2.0	1.0	0.50	--	0.041
1,2-Dibromo-3-chloropropane (DBCP)	4.0	2.0	1.0	0.2	0.2
1,2-Dibromoethane (EDB)	1.0	0.50	0.25	--	0.05

Perchlorate: The nominal LOQs were below the PALs listed in the QAPP.

Analyte	Soil LOQ (µg/kg)	Soil LOD (µg/kg)	Soil DL (µg/kg)	TCEQ GW-Ind Soil MSC (µg/kg)
Perchlorate	5.00	2.50	1.25	7200
Analyte	**LOQ (µg/L)**	**LOD (µg/L)**	**DL (µg/L)**	**TCEQ GW-Ind Water MSC (µg/L)**
Perchlorate	0.400	0.200	0.100	72

1,4-Dioxane: The nominal LOQ of 1 µg/L was below the PAL of 26 µg/L listed in the QAPP.

XII. SAMPLE RESULTS / TRANSCRIPTION VERIFICATION
Transcription between the data package and the EDDs was verified. Non-detect sample results were reported to the LOD, but detections below the LOD were reported. Sample results detected between the DL and LOQ were qualified as estimated (J).

VOCs: No issues.

Perchlorate: No issues.

1,4-Dioxane: No issues.

XIII. PARCCS PARAMETERS AND DATA USABILITY

Data were usable as discussed below.

The data quality indicators (DQIs), expressed in terms of precision, accuracy, representativeness, comparability, completeness, and sensitivity (PARCCS parameters), were assessed. This included the evaluation of sample integrity, holding times, trip blanks, rinsate blanks, method blanks, internal standards, surrogate recoveries, MS/MSD results, LCS/D results, and field and lab duplicate precision. The results of the DQI assessment are provided below.

PRECISION

Field duplicates are collected to assess sampling precision. Lab duplicates and LCS/Ds and MS/Ds are analyzed to assess analysis precision. Precision is best expressed in terms of relative percent difference (RPD).

Lab precision goals were generally met. One VOC analyte had an LCS/LCSD RPD outside control limits, but this did not result in any sample qualification. No lab duplicates were analyzed.

Field precision goals were generally met. Twelve VOC analytes had MS/MSD RPDs outside control limits, but this did not result in any sample qualification.

ACCURACY

Accuracy or bias is measured through the analyses of LCS/Ds (lab accuracy) and MS/MSDs (field accuracy). Sample specific accuracy is measured through surrogate recovery. Accuracy is expressed as percent recovery (%R).

Lab accuracy goals were generally met. Three VOC analytes in all nine soil samples and one VOC analyte in eight GW samples required qualification as estimated due to high %D values in the ICVs. One VOC analyte in 24 GW samples required qualification as estimated due to high %D values in the CCVs. Three VOC analytes had LCS recoveries outside control limits, but this did not result in any sample qualification.

Field accuracy goals were generally met. Five VOC analytes in one soil sample, one VOC analyte in two GW samples, perchlorate in one GW sample, and 1,4-dioxane in one GW sample required estimation due to MS or MSD recoveries outside control limits.

Most sample-specific accuracy via surrogate recoveries were met. Two VOC analytes in one sample and 1,4-dioxane in one sample required estimation due to surrogate recoveries outside control limits.

REPRESENTATIVENESS

Representativeness refers to the degree sample data accurately and precisely describes the population of samples at a sampling point or under certain environmental conditions. Samples that are not properly preserved or are analyzed beyond holding times may not be considered representative. Review of sampling procedures, laboratory preparation, analysis holding times, trip blank and rinsate blank analysis help in providing this assessment.

Representativeness goals were generally met except in these instances:

- Results for one VOC analyte in five samples, all VOCs in four samples, and perchlorate in seven samples were qualified as estimated due to analysis past the holding time.

COMPARABILITY
The selection of standardized methods and consistent laboratory practices facilitates the comparison of data between sampling events.

Comparability goals were met. Samples were analyzed by standardized methods (SW-846). Future sampling events will be analyzed by the same methods at the same labs to achieve comparability.

COMPLETENESS
Completeness is determined for both field and analytical objectives. Field completeness is calculated from the number of samples proposed versus the actual number of samples collected. Analytical completeness is expressed in terms of usable data.

The field completeness goal of 85% as listed in the project QAPP was met. All proposed samples were collected, for a field completeness of 100%.

The analytical completeness goal of 85% as specified in the project QAPP was met. No data were rejected, and completeness for all analytes was 100%.

SENSITIVITY
Analytical sensitivity is the concentration at which the measurement system can quantitate target analytes in the environmental matrices of concern. Analytical sensitivity is expressed in terms of the LOQ, which is provided by the respective laboratories as their reasonable and defensible quantitation limit for environmental samples above the DL, which is established by each laboratory using pure water or clean matrix.

Sensitivity goals were generally met; refer to Section XI for details. The groundwater LOQ, LOD, and DL for three VOC analytes were all above the PAL, and non-detect results for these analytes cannot be determined to be definitely below the PALs.

VOCs: No data were rejected. Data are usable as qualified for the purpose of further delineation and depth extent of contamination.

Perchlorate: No data were rejected. Data are usable as qualified for the purpose of further delineation and depth extent of contamination.

1,4-Dioxane: No data were rejected. Data are usable as qualified for the purpose of further delineation and depth extent of contamination.

Attachment 7. Raw Analytical Data Package

Attachment 8. Full Analytical Data Table

DPT Soil Results

Chemical Abstracts Service Number	Chemical Name	Sample ID	1824DPT17 (29)		1824DPT18 (29)		1824DPT19 (42)		1824DPT20 (41)		1824DPT21 (38)		1824DPT22 (38)		1824DPT23 (38)	
		Collection Date	3/19/2021		3/25/2021		3/25/2021		3/25/2021		3/25/2021		3/25/2021		3/23/2021	
		Sampled Media	Soil		Soil		Soil		Soil		Soil		Soil		Soil	
		Percent Solids	83.2		80.3		82.1		80.2		81.3		79.6		82.3	
		Comparison Level (ug/kg)	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier
SW6850 - Perchlorate (ug/kg)																
14797-73-0	Perchlorate	7200[(1)]	**11000**	J	**23900**		307		2800		4.57	J	2720		1.38	J
SW8260B - VOCs (ug/kg)																
630-20-6	1,1,1,2-Tetrachloroethane	0.0052	<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
71-55-6	1,1,1-Trichloroethane		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
79-34-5	1,1,2,2-Tetrachloroethane		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane		1220	J	32.3		<1.73	U	27.1	J	<1.94	U	1.20	J	<1.62	U
79-00-5	1,1,2-Trichloroethane		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
75-34-3	1,1-Dichloroethane		1.42	J	<2.02	U	<1.73	U	<1.92	U	<1.94	U	<1.92	U	<1.62	U
75-35-4	1,1-Dichloroethene		5.48		<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
563-58-6	1,1-Dichloropropene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
87-61-6	1,2,3-Trichlorobenzene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
96-18-4	1,2,3-Trichloropropane		<1.96	U	<2.02	U	<1.73	U	<1.92	U	<1.94	U	<1.92	U	<1.62	U
120-82-1	1,2,4-Trichlorobenzene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
95-63-6	1,2,4-Trimethylbenzene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
96-12-8	1,2-Dibromo-3-chloropropane		<3.93	U	<4.05	U	<3.45	U	<3.83	U	<3.88	U	<3.84	U	<3.24	U
106-93-4	1,2-Dibromoethane		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
95-50-1	1,2-Dichlorobenzene		<0.982	U	<1.01	U	<0.863	U	<0.958	UJ	<0.970	U	<0.960	U	<0.810	U
107-06-2	1,2-Dichloroethane		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
78-87-5	1,2-Dichloropropane		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
108-67-8	1,3,5-Trimethylbenzene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
541-73-1	1,3-Dichlorobenzene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
142-28-9	1,3-Dichloropropane		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
106-46-7	1,4-Dichlorobenzene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
594-20-7	2,2-Dichloropropane		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
78-93-3	2-Butanone		<4.91	U	<5.06	U	<4.31	U	<4.79	U	<4.85	U	<4.80	U	<4.05	U
95-49-8	2-Chlorotoluene		<0.982	U	<1.01	U	<0.863	U	<0.958	UJ	<0.970	U	<0.960	U	<0.810	U
591-78-6	2-Hexanone		<4.91	U	<5.06	U	<4.31	U	<4.79	U	<4.85	U	<4.80	U	<4.05	U
106-43-4	4-Chlorotoluene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
108-10-1	4-Methyl-2-pentanone		<4.91	U	<5.06	U	<4.31	U	<4.79	U	<4.85	U	<4.80	U	<4.05	U
67-64-1	Acetone		<9.82	U	<10.1	U	<8.63	U	5.23	J	<9.70	U	<9.60	U	4.46	J
71-43-2	Benzene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
108-86-1	Bromobenzene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
74-97-5	Bromochloromethane		<1.96	U	<2.02	U	<1.73	U	<1.92	U	<1.94	U	<1.92	U	<1.62	U
75-27-4	Bromodichloromethane		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
75-25-2	Bromoform		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
74-83-9	Bromomethane		<1.96	U	<2.02	U	<1.73	U	<1.92	U	<1.94	U	<1.92	U	<1.62	U
75-15-0	Carbon disulfide		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
56-23-5	Carbon tetrachloride		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
108-90-7	Chlorobenzene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
124-48-1	Chlorodibromomethane		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
75-00-3	Chloroethane (Ethyl chloride)		<1.96	U	<2.02	U	<1.73	U	<1.92	U	<1.94	U	<1.92	U	<1.62	U
67-66-3	Chloroform		1.49	J	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
156-59-2	cis-1,2-Dichloroethene		353	J	3.05		<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
10061-01-5	cis-1,3-Dichloropropene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
74-95-3	Dibromomethane		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
75-71-8	Dichlorodifluoromethane		<1.96	U	<2.02	U	<1.73	U	<1.92	U	<1.94	U	<1.92	U	<1.62	U
100-41-4	Ethylbenzene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
87-68-3	Hexachlorobutadiene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
98-82-8	Isopropylbenzene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
179601-23-1	m-,p-Xylene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
75-09-2	Methylene chloride	500[(1)]	<1.96	U	<2.02	U	<1.73	U	<1.92	U	<1.94	U	<1.92	U	<1.62	U
91-20-3	Naphthalene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
104-51-8	n-Butylbenzene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U

DPT Soil Results

Chemical Abstracts Service Number	Chemical Name	Sample ID	1824DPT17 (29)		1824DPT18 (29)		1824DPT19 (42)		1824DPT20 (41)		1824DPT21 (38)		1824DPT22 (38)		1824DPT23 (38)	
		Collection Date	3/19/2021		3/25/2021		3/25/2021		3/25/2021		3/25/2021		3/25/2021		3/23/2021	
		Sampled Media	Soil		Soil		Soil		Soil		Soil		Soil		Soil	
		Percent Solids	83.2		80.3		82.1		80.2		81.3		79.6		82.3	
		Comparison Level (ug/kg)	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier
100-42-5	Styrene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
98-06-6	tert-Butylbenzene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
127-18-4	Tetrachloroethene	500[1]	0.850	J	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
108-88-3	Toluene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
156-60-5	trans-1,2-Dichloroethene		1.01	J	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
10061-02-6	trans-1,3-Dichloropropene		<0.982	U	<1.01	U	<0.863	U	<0.958	U	<0.970	U	<0.960	U	<0.810	U
79-01-6	Trichloroethene	500[1]	**933**	J	31.7		<0.863	U	12.3	J	<0.970	U	<0.960	U	<0.810	U
108-05-4	Vinyl acetate		<4.91	UJ	<5.06	UJ	<4.31	UJ	<4.79	UJ	<4.85	UJ	<4.80	UJ	<4.05	UJ
75-01-4	Vinyl chloride		<1.96	U	<2.02	U	<1.73	U	<1.92	U	<1.94	U	<1.92	U	<1.62	U

Notes:

Bolded result indicates exceddance of comparison level

1 - For impact assessment only, TCEQ GWP-Ind MSC for industrial use, based on groundwater protection

ug/kg = micrograms per kilogram

J = estimated value

UJ = not detected, level of detection is estimated

U = not detected

DPT Soil Results

Chemical Abstracts Service Number	Chemical Name	Sample ID	DUP-04		1824DPT24 (27.5)		1824DPT25 (28)		1824DPT26 (38)		1824DPT27 (39)		1824DPT27A (30)		1824DPT28 (40)		1824DPT29 (40)	
		Collection Date	3/23/2021		3/17/2021		3/17/2021		6/11/2021		6/11/2021		6/11/2021		6/11/2021		6/10/2021	
		Sampled Media	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
		Percent Solids	82.1		76.6		79.7		80.9		81.5		83.6		82.5		80.8	
		Comparison Level (ug/kg)	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier
SW6850 - Perchlorate (ug/kg)																		
14797-73-0	Perchlorate	7200[1]	1.83	J	6.69		<2.51	U	53.7		3.21	J	8.22		2.05	J	**10,200**	
SW8260B - VOCs (ug/kg)																		
630-20-6	1,1,1,2-Tetrachloroethane	0.0052	<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
71-55-6	1,1,1-Trichloroethane		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
79-34-5	1,1,2,2-Tetrachloroethane		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane		<1.91	U	<9.85	U	<1.87	U	<1.90	U	<1.95	U	<1.84	U	<1.84	U	15.4	
79-00-5	1,1,2-Trichloroethane		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
75-34-3	1,1-Dichloroethane		<1.91	U	<9.85	U	<1.87	U	<1.90	U	<1.95	U	<1.84	U	<1.84	U	<1.85	U
75-35-4	1,1-Dichloroethene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
563-58-6	1,1-Dichloropropene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
87-61-6	1,2,3-Trichlorobenzene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
96-18-4	1,2,3-Trichloropropane		<1.91	U	<9.85	U	<1.87	U	<1.90	U	<1.95	U	<1.84	U	<1.84	U	<1.85	U
120-82-1	1,2,4-Trichlorobenzene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
95-63-6	1,2,4-Trimethylbenzene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
96-12-8	1,2-Dibromo-3-chloropropane		<3.82	U	<19.7	U	<3.73	U	<3.79	U	<3.90	U	<3.69	U	<3.68	U	<3.70	U
106-93-4	1,2-Dibromoethane		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
95-50-1	1,2-Dichlorobenzene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
107-06-2	1,2-Dichloroethane		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
78-87-5	1,2-Dichloropropane		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
108-67-8	1,3,5-Trimethylbenzene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
541-73-1	1,3-Dichlorobenzene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
142-28-9	1,3-Dichloropropane		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
106-46-7	1,4-Dichlorobenzene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
594-20-7	2,2-Dichloropropane		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
78-93-3	2-Butanone		<4.77	U	<24.6	U	<4.66	U	<4.74	U	<4.87	U	<4.61	U	<4.60	U	<4.63	U
95-49-8	2-Chlorotoluene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
591-78-6	2-Hexanone		<4.77	U	<24.6	U	<4.66	U	<4.74	U	<4.87	U	<4.61	U	<4.60	U	<4.63	U
106-43-4	4-Chlorotoluene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
108-10-1	4-Methyl-2-pentanone		<4.77	U	<24.6	U	<4.66	U	<4.74	U	<4.87	U	<4.61	U	<4.60	U	<4.63	U
67-64-1	Acetone		<9.55	U	<49.2	U	<9.33	U	<9.48	U	<9.74	U	<9.21	U	<9.20	U	<9.26	U
71-43-2	Benzene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
108-86-1	Bromobenzene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
74-97-5	Bromochloromethane		<1.91	U	<9.85	U	<1.87	U	<1.90	U	<1.95	U	<1.84	U	<1.84	U	<1.85	U
75-27-4	Bromodichloromethane		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
75-25-2	Bromoform		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
74-83-9	Bromomethane		<1.91	U	<9.85	U	<1.87	U	<1.90	UJ	<1.95	UJ	<1.84	UJ	<1.84	UJ	<1.85	UJ
75-15-0	Carbon disulfide		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
56-23-5	Carbon tetrachloride		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
108-90-7	Chlorobenzene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
124-48-1	Chlorodibromomethane		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
75-00-3	Chloroethane (Ethyl chloride)		<1.91	U	<9.85	U	<1.87	U	<1.90	U	<1.95	U	<1.84	U	<1.84	U	<1.85	U
67-66-3	Chloroform		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
156-59-2	cis-1,2-Dichloroethene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	2.00	
10061-01-5	cis-1,3-Dichloropropene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
74-95-3	Dibromomethane		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
75-71-8	Dichlorodifluoromethane		<1.91	U	<9.85	U	<1.87	U	<1.90	UJ	<1.95	UJ	<1.84	UJ	<1.84	UJ	<1.85	UJ
100-41-4	Ethylbenzene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
87-68-3	Hexachlorobutadiene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
98-82-8	Isopropylbenzene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
179601-23-1	m-,p-Xylene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
75-09-2	Methylene chloride	500[1]	<1.91	U	20.0		<1.87	U	1.23	J	1.13	J	1.97	J	2.02	J	1.43	J
91-20-3	Naphthalene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
104-51-8	n-Butylbenzene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U

DPT Soil Results

Chemical Abstracts Service Number	Chemical Name	Sample ID															
		Collection Date	<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
		Sampled Media	<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
		Percent Solids	<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
		Comparison Level (ug/kg)	<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
100-42-5	Styrene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
98-06-6	tert-Butylbenzene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
127-18-4	Tetrachloroethene	500(1)	<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
108-88-3	Toluene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
156-60-5	trans-1,2-Dichloroethene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
10061-02-6	trans-1,3-Dichloropropene		<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	<0.926	U
79-01-6	Trichloroethene	500(1)	<0.955	U	<4.92	U	<0.933	U	<0.948	U	<0.974	U	<0.921	U	<0.920	U	16.8	
108-05-4	Vinyl acetate		<4.77	UJ	<24.6	UJ	<4.66	UJ	<4.74	UJ	<4.87	UJ	<4.61	UJ	<4.60	UJ	<4.63	UJ
75-01-4	Vinyl chloride		<1.91	U	<9.85	U	<1.87	U	<1.90	U	<1.95	U	<1.84	U	<1.84	U	0.979	J

Notes:

Bolded result indicates exceddance of comparison level

1 - For impact assessment only, TCEQ GWP-Ind MSC for industrial use, based on groundwater protection

ug/kg = micrograms per kilogram

J = estimated value

UJ = not detected, level of detection is estimated

U = not detected

DPT Soil Results

Chemical Abstracts Service Number	Chemical Name	Sample ID	1824DPT29A (38)		1824DPT30 (37)		1824DPT31 (36)		DUP-05	
		Collection Date	6/10/2021		6/10/2021		6/10/2021		6/10/2021	
		Sampled Media	Soil		Soil		Soil		Soil	
		Percent Solids	79.8		84.0		81.7		82.1	
		Comparison Level (ug/kg)	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier	Result (ug/kg)	Qualifier
SW6850 - Perchlorate (ug/kg)										
14797-73-0	Perchlorate	7200[(1)]	1,090		5,840		783	J	1,360	J
SW8260B - VOCs (ug/kg)										
630-20-6	1,1,1,2-Tetrachloroethane	0.0052	<0.828	U	<0.861	U	<0.899	U	<0.939	U
71-55-6	1,1,1-Trichloroethane		<0.828	U	<0.861	U	<0.899	U	<0.939	U
79-34-5	1,1,2,2-Tetrachloroethane		<0.828	U	<0.861	U	<0.899	U	<0.939	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane		107		3.63	J	6.25	J	9.27	J
79-00-5	1,1,2-Trichloroethane		<0.828	U	<0.861	U	<0.899	U	<0.939	U
75-34-3	1,1-Dichloroethane		<1.66	U	<1.72	U	<1.80	U	<1.88	U
75-35-4	1,1-Dichloroethene		1.72		<0.861	U	<0.899	U	<0.939	U
563-58-6	1,1-Dichloropropene		<0.828	U	<0.861	U	<0.899	U	<0.939	U
87-61-6	1,2,3-Trichlorobenzene		<0.828	U	<0.861	U	<0.899	U	<0.939	U
96-18-4	1,2,3-Trichloropropane		<1.66	U	<1.72	U	<1.80	U	<1.88	U
120-82-1	1,2,4-Trichlorobenzene		<0.828	U	<0.861	U	<0.899	U	<0.939	U
95-63-6	1,2,4-Trimethylbenzene		<0.828	U	<0.861	U	<0.899	U	<0.939	U
96-12-8	1,2-Dibromo-3-chloropropane		<3.31	U	<3.44	U	<3.59	U	<3.76	U
106-93-4	1,2-Dibromoethane		<0.828	U	<0.861	U	<0.899	U	<0.939	U
95-50-1	1,2-Dichlorobenzene		<0.828	U	<0.861	UJ	<0.899	U	<0.939	U
107-06-2	1,2-Dichloroethane		<0.828	U	<0.861	U	<0.899	U	<0.939	U
78-87-5	1,2-Dichloropropane		<0.828	U	<0.861	U	<0.899	U	<0.939	U
108-67-8	1,3,5-Trimethylbenzene		<0.828	U	<0.861	U	<0.899	U	<0.939	U
541-73-1	1,3-Dichlorobenzene		<0.828	U	<0.861	UJ	<0.899	U	<0.939	U
142-28-9	1,3-Dichloropropane		<0.828	U	<0.861	U	<0.899	U	<0.939	U
106-46-7	1,4-Dichlorobenzene		<0.828	U	<0.861	UJ	<0.899	U	<0.939	U
594-20-7	2,2-Dichloropropane		<0.828	U	<0.861	U	<0.899	U	<0.939	U
78-93-3	2-Butanone		<4.14	U	<4.30	U	<4.49	U	<4.70	U
95-49-8	2-Chlorotoluene		<0.828	U	<0.861	U	<0.899	U	<0.939	U
591-78-6	2-Hexanone		<4.14	U	<4.30	U	<4.49	U	<4.70	U
106-43-4	4-Chlorotoluene		<0.828	U	<0.861	UJ	<0.899	U	<0.939	U
108-10-1	4-Methyl-2-pentanone		<4.14	U	<4.30	U	<4.49	U	<4.70	U
67-64-1	Acetone		<8.28	U	<8.61	U	<8.99	U	<9.39	U
71-43-2	Benzene		<0.828	U	<0.861	U	<0.899	U	<0.939	U
108-86-1	Bromobenzene		<0.828	U	<0.861	UJ	<0.899	U	<0.939	U
74-97-5	Bromochloromethane		<1.66	U	<1.72	U	<1.80	U	<1.88	U
75-27-4	Bromodichloromethane		<0.828	U	<0.861	U	<0.899	U	<0.939	U
75-25-2	Bromoform		<0.828	U	<0.861	U	<0.899	U	<0.939	U
74-83-9	Bromomethane		<1.66	UJ	<1.72	UJ	<1.80	UJ	<1.88	UJ
75-15-0	Carbon disulfide		<0.828	U	<0.861	U	<0.899	U	<0.939	U
56-23-5	Carbon tetrachloride		<0.828	U	<0.861	U	<0.899	U	<0.939	U
108-90-7	Chlorobenzene		<0.828	U	<0.861	U	<0.899	U	<0.939	U
124-48-1	Chlorodibromomethane		<0.828	U	<0.861	U	<0.899	U	<0.939	U
75-00-3	Chloroethane (Ethyl chloride)		<1.66	U	<1.72	U	<1.80	U	<1.88	U
67-66-3	Chloroform		<0.828	U	<0.861	U	<0.899	U	<0.939	U
156-59-2	cis-1,2-Dichloroethene		3.46		<0.861	U	<0.899	U	<0.939	U
10061-01-5	cis-1,3-Dichloropropene		<0.828	U	<0.861	U	<0.899	U	<0.939	U
74-95-3	Dibromomethane		<0.828	U	<0.861	U	<0.899	U	<0.939	U
75-71-8	Dichlorodifluoromethane		<1.66	UJ	<1.72	UJ	<1.80	UJ	<1.88	UJ
100-41-4	Ethylbenzene		<0.828	U	<0.861	U	<0.899	U	<0.939	U
87-68-3	Hexachlorobutadiene		<0.828	U	<0.861	U	<0.899	U	<0.939	U
98-82-8	Isopropylbenzene		<0.828	U	<0.861	U	<0.899	U	<0.939	U
179601-23-1	m-,p-Xylene		<0.828	U	<0.861	U	<0.899	U	<0.939	U
75-09-2	Methylene chloride	500[(1)]	1.08	J	2.63	J	2.16	J	2.79	J
91-20-3	Naphthalene		<0.828	U	<0.861	U	<0.899	U	<0.939	U
104-51-8	n-Butylbenzene		<0.828	U	<0.861	U	<0.899	U	<0.939	U

DPT Soil Results

Chemical Abstracts Service Number	Chemical Name	Sample ID								
		Collection Date	<0.828	U	<0.861	U	<0.899	U	<0.939	U
		Sampled Media	<0.828	U	<0.861	U	<0.899	U	<0.939	U
		Percent Solids	<0.828	U	<0.861	U	<0.899	U	<0.939	U
		Comparison Level (ug/kg)	<0.828	U	<0.861	U	<0.899	U	<0.939	U
100-42-5	Styrene		<0.828	U	<0.861	U	<0.899	U	<0.939	U
98-06-6	tert-Butylbenzene		<0.828	U	<0.861	U	<0.899	U	<0.939	U
127-18-4	Tetrachloroethene	500(1)	<0.828	U	<0.861	U	<0.899	U	<0.939	U
108-88-3	Toluene		<0.828	U	<0.861	U	<0.899	U	<0.939	U
156-60-5	trans-1,2-Dichloroethene		<0.828	U	<0.861	U	<0.899	U	<0.939	U
10061-02-6	trans-1,3-Dichloropropene		<0.828	U	<0.861	U	<0.899	U	<0.939	U
79-01-6	Trichloroethene	500(1)	21.0		1.23	J	0.732	J	0.590	J
108-05-4	Vinyl acetate		<4.14	UJ	<4.30	UJ	<4.49	UJ	<4.70	UJ
75-01-4	Vinyl chloride		2.26	J	<1.72	U	<1.80	U	<1.88	U

Notes:

Bolded result indicates exceddance of comparison level

1 - For impact assessment only, TCEQ GWP-Ind MSC for industrial use, based on groundwater protection

ug/kg = micrograms per kilogram

J = estimated value

UJ = not detected, level of detection is estimated

U = not detected

DPT Groundwater Results

01077189

Chemical Abstracts Service Number	Chemical Name	Sample ID	1824DPT01		1824DPT02		1824DPT03		1824DPT04		1824DPT05		1824DPT06		1824DPT07	
		Collection Date	3/18/2021		3/18/2021		3/18/2021		3/17/2021		3/18/2021		3/18/2021		3/18/2021	
		Sampled Media	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
		Comparison Level (ug/L)	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier
SW6850 - Perchlorate (ug/L)																
14797-73-0	Perchlorate	17[2]	**2350**		**32400**		**214000**		**85000**		**35600**		**26200**		**137000**	
SW8260B - VOCs (ug/L)																
630-20-6	1,1,1,2-Tetrachloroethane		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
71-55-6	1,1,1-Trichloroethane		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
79-34-5	1,1,2,2-Tetrachloroethane		<0.400	U	<0.400	U	<8.00	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane		1590		717		2850		8290		16400		18400		15000	
79-00-5	1,1,2-Trichloroethane	5[1]	**5.53**		0.548	J	<10.0	U	1.81		2.35		2.81		1.65	
75-34-3	1,1-Dichloroethane		2.15		0.838		<5.00	U	3.28		2.25		3.12		1.11	
75-35-4	1,1-Dichloroethene		43.1		10.4		<20.0	U	31.5		53.5		62.9		52.9	
563-58-6	1,1-Dichloropropene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
87-61-6	1,2,3-Trichlorobenzene		<0.300	U	<0.300	U	<6.00	U	<0.300	U	<0.300	U	<0.300	U	<0.300	U
96-18-4	1,2,3-Trichloropropane		<1.00	U	<1.00	U	<20.0	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
120-82-1	1,2,4-Trichlorobenzene		<0.400	U	<0.400	U	<8.00	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
95-63-6	1,2,4-Trimethylbenzene		0.526	J	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
96-12-8	1,2-Dibromo-3-chloropropane		<2.00	U	<2.00	U	<40.0	U	<2.00	U	<2.00	U	<2.00	U	<2.00	U
106-93-4	1,2-Dibromoethane		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
95-50-1	1,2-Dichlorobenzene		0.710		<0.250	U	<5.00	U	<0.250	U	0.275	J	0.326	J	<0.250	U
107-06-2	1,2-Dichloroethane		1020		59.2		59.2		114		313	J	421		174	
78-87-5	1,2-Dichloropropane		<0.400	U	<0.400	U	<8.00	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
108-67-8	1,3,5-Trimethylbenzene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
541-73-1	1,3-Dichlorobenzene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
142-28-9	1,3-Dichloropropane		<0.400	U	<0.400	U	<8.00	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
106-46-7	1,4-Dichlorobenzene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
594-20-7	2,2-Dichloropropane		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
78-93-3	2-Butanone		<5.00	U	<5.00	U	<100	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U
95-49-8	2-Chlorotoluene		<0.250	U	<0.250	U	<5.00	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U
591-78-6	2-Hexanone		<5.00	U	<5.00	U	<100	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U
106-43-4	4-Chlorotoluene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
108-10-1	4-Methyl-2-pentanone		<5.00	U	<5.00	U	<100	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U
67-64-1	Acetone		4.41	J+	<5.00	U	<100	U	<5.00	U	3.53	J+	3.30	J+	2.51	J+
71-43-2	Benzene	5[1]	**11.3**		4.26		**7.73**		4.31		**6.51**		**7.72**		**8.62**	
108-86-1	Bromobenzene		<0.250	U	<0.250	U	<5.00	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U
74-97-5	Bromochloromethane		<0.400	U	<0.400	U	<8.00	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
75-27-4	Bromodichloromethane	15[2]	<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
75-25-2	Bromoform		<1.00	U	<1.00	U	<20.0	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
74-83-9	Bromomethane		<1.00	UJ	<1.00	UJ	<20.0	UJ	<1.00	UJ	<1.00	UJ	<1.00	UJ	<1.00	UJ
75-15-0	Carbon disulfide		<1.00	U	<1.00	U	<20.0	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
56-23-5	Carbon tetrachloride		<0.500	U	33.6		35.4		15.2		19.8		30.0		64.4	
108-90-7	Chlorobenzene		<0.250	U	<0.250	U	<5.00	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U
124-48-1	Chlorodibromomethane		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
75-00-3	Chloroethane (Ethyl chloride)		<1.00	U	<1.00	U	<20.0	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
67-66-3	Chloroform		29.2		40.4		25.8		21.4		30.7		29.8		33.0	
74-87-3	Chloromethane		<1.00	U	<1.00	U	<20.0	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
156-59-2	cis-1,2-Dichloroethene*	70[1]	**16100**		122		19.6	J	**74.5**		**1570**		**2150**		**317**	
10061-01-5	cis-1,3-Dichloropropene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
74-95-3	Dibromomethane		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
75-71-8	Dichlorodifluoromethane		2.97		0.367	J	6.42	J	4.32		6.34		4.28		3.26	
100-41-4	Ethylbenzene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
87-68-3	Hexachlorobutadiene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
98-82-8	Isopropylbenzene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
179601-23-1	m-,p-Xylene		0.717	J	<1.00	U	<20.0	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
75-09-2	Methylene chloride	5[1]	4.88		0.757	J	<10.0	U	1.45		4.29		4.57		2.21	
91-20-3	Naphthalene		<0.400	U	<0.400	U	<8.00	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
104-51-8	n-Butylbenzene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U

DPT Groundwater Results

Chemical Abstracts Service Number	Chemical Name	Sample ID	1824DPT01		1824DPT02		1824DPT03		1824DPT04		1824DPT05		1824DPT06		1824DPT07	
		Collection Date	3/18/2021		3/18/2021		3/18/2021		3/17/2021		3/18/2021		3/18/2021		3/18/2021	
		Sampled Media	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
		Comparison Level (ug/L)	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier
135-98-8	sec-Butylbenzene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
100-42-5	Styrene		<0.250	U	<0.250	U	<5.00	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U
98-06-6	tert-Butylbenzene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
127-18-4	Tetrachloroethene	5[(1)]	1.85		2.83		<10.0	U	3.18		3.30		4.00		3.57	
108-88-3	Toluene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
156-60-5	trans-1,2-Dichloroethene		85.0		0.755	J	<10.0	U	5.23		15.3		18.0		5.73	
10061-02-6	trans-1,3-Dichloropropene		<1.00	U	<1.00	U	<20.0	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
79-01-6	Trichloroethene	5[(1)]	**7530**		**6340**		**2810**		**5620**		**12700**		**13100**		**11200**	
75-69-4	Trichlorofluoromethane		<0.500	U	<0.500	U	<10.0	U	<0.500	U	0.262	J	0.343	J	<0.500	U
108-05-4	Vinyl acetate		<5.00	UJ	<5.00	UJ	<100	UJ	<5.00	U	<5.00	UJ	<5.00	UJ	<5.00	UJ
75-01-4	Vinyl chloride*	2[(1)]	**445**		<50.0	U	<10.0	U	**3.73**		**26.6**		**18.7**		**5.11**	

Notes:

Bolded result indicates exceddance of comparison level

*Trichloroethene daughter products

1 - Safe Drinking Water Act (SDWA) maximum contaminant level (MCL)

2 - TRRP $^{GW}GW_{Ing}$ Protective Concentration Level (PCL) from April 2018, https://www.tceq.texas.gov/remediation/trrp/trrppcls.html

ug/L = micrograms per liter

J = estimated value

J+ = estimated value, possibly biased high

UJ = not detected, level of detection is estimated

U = not detected

DPT Groundwater Results

01077191

Chemical Abstracts Service Number	Chemical Name	Sample ID	1824DPT08		DUP-02		1824DPT09		1824DPT10		DUP-01		1824DPT11		1824DPT12		1824DPT13	
		Collection Date	3/17/2021		3/17/2021		3/17/2021		3/17/2021		3/17/2021		3/18/2021		3/18/2021		3/17/2021	
		Sampled Media	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
		Comparison Level (ug/L)	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier
SW6850 - Perchlorate (ug/L)																		
14797-73-0	Perchlorate	17[2]	**87300**		**91000**		**56900**		**42000**		**45100**		**65900**		**59500**		**71300**	
630-20-6	1,1,1,2-Tetrachloroethane		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
71-55-6	1,1,1-Trichloroethane		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
79-34-5	1,1,2,2-Tetrachloroethane		<0.400	U	<0.400	U	<8.00	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane		1590		717		2850		8290		16400		18400		15000		11000	
79-00-5	1,1,2-Trichloroethane	5[1]	**5.53**		0.548	J	<10.0	U	1.81		2.35		2.81		1.65	J	1.58	
75-34-3	1,1-Dichloroethane		2.15		0.838		<5.00	U	3.28		2.25		3.12		1.11		1.96	
75-35-4	1,1-Dichloroethene		43.1		10.4		<20.0	U	31.5		53.5		62.9		52.9		44.1	
563-58-6	1,1-Dichloropropene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
87-61-6	1,2,3-Trichlorobenzene		<0.300	U	<0.300	U	<6.00	U	<0.300	U	<0.300	U	<0.300	U	<0.300	U	<0.300	U
96-18-4	1,2,3-Trichloropropane		<1.00	U	<1.00	U	<20.0	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
120-82-1	1,2,4-Trichlorobenzene		<0.400	U	<0.400	U	<8.00	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
95-63-6	1,2,4-Trimethylbenzene		0.526	J	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500		<0.500	U
96-12-8	1,2-Dibromo-3-chloropropane		<2.00	U	<2.00	U	<40.0	U	<2.00	U	<2.00	U	<2.00	U	<2.00	U	<2.00	U
106-93-4	1,2-Dibromoethane		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
95-50-1	1,2-Dichlorobenzene		0.710		<0.250	U	<5.00	U	<0.250	U	0.275	J	0.326	J	<0.250	U	<0.250	U
107-06-2	1,2-Dichloroethane		1020		59.2		59.2		114		313	J	421		174		146	
78-87-5	1,2-Dichloropropane		<0.400	U	<0.400	U	<8.00	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
108-67-8	1,3,5-Trimethylbenzene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	J	<0.500	U
541-73-1	1,3-Dichlorobenzene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
142-28-9	1,3-Dichloropropane		<0.400	U	<0.400	U	<8.00	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
106-46-7	1,4-Dichlorobenzene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
594-20-7	2,2-Dichloropropane		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
78-93-3	2-Butanone		<5.00	U	<5.00	U	<100	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U
95-49-8	2-Chlorotoluene		<0.250	U	<0.250	U	<5.00	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U
591-78-6	2-Hexanone		<5.00	U	<5.00	U	<100	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U
106-43-4	4-Chlorotoluene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
108-10-1	4-Methyl-2-pentanone		<5.00	U	<5.00	U	<100	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U
67-64-1	Acetone		4.41	J+	<5.00	U	<100	U	<5.00	U	3.53	J+	3.30	J+	2.51	U	<5.00	U
71-43-2	Benzene	5[1]	**11.3**		4.26		**7.73**		4.31		**6.51**		**7.72**		**8.62**		3.63	
108-86-1	Bromobenzene		<0.250	U	<0.250	U	<5.00	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U
74-97-5	Bromochloromethane		<0.400	U	<0.400	U	<8.00	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
75-27-4	Bromodichloromethane	15[2]	<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
75-25-2	Bromoform		<1.00	U	<1.00	U	<20.0	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
74-83-9	Bromomethane		<1.00	UJ	<1.00	UJ	<20.0	UJ	<1.00	UJ	<1.00	UJ	<1.00	UJ	<1.00	UJ	<1.00	UJ
75-15-0	Carbon disulfide		<1.00	U	<1.00	U	<20.0	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
56-23-5	Carbon tetrachloride		<0.500	U	33.6		35.4		15.2		19.8		30.0		64.4		14.1	
108-90-7	Chlorobenzene		<0.250	U	<0.250	U	<5.00	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U
124-48-1	Chlorodibromomethane		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
75-00-3	Chloroethane (Ethyl chloride)		<1.00	U	<1.00	U	<20.0	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
67-66-3	Chloroform		29.2		40.4		25.8		21.4		30.7		29.8		33.0		24.7	
74-87-3	Chloromethane		<1.00	U	<1.00	U	<20.0	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
156-59-2	cis-1,2-Dichloroethene*	70[1]	**16100**		122		19.6	J	**74.5**		**1570**		**2150**		**317**		**94.1**	
10061-01-5	cis-1,3-Dichloropropene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
74-95-3	Dibromomethane		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
75-71-8	Dichlorodifluoromethane		2.97		0.367	J	6.42	J	4.32		6.34		4.28		3.26		4.05	
100-41-4	Ethylbenzene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
87-68-3	Hexachlorobutadiene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
98-82-8	Isopropylbenzene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
179601-23-1	m-,p-Xylene		0.717	J	<1.00	U	<20.0	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
75-09-2	Methylene chloride	5[1]	4.88		0.757	J	<10.0	U	1.45		4.29		4.57		2.21	J	1.42	
91-20-3	Naphthalene		<0.400	U	<0.400	U	<8.00	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
104-51-8	n-Butylbenzene		<0.500	U	<0.500	U	<10.0	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U

DPT Groundwater Results

Chemical Abstracts Service Number	Chemical Name	Sample ID	1824DPT08		DUP-02		1824DPT09		1824DPT10		DUP-01		1824DPT11		1824DPT12		1824DPT13	
		Collection Date	3/17/2021		3/17/2021		3/17/2021		3/17/2021		3/17/2021		3/18/2021		3/18/2021		3/17/2021	
		Sampled Media	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
		Comparison Level (ug/L)	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier
135-98-8	sec-Butylbenzene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
100-42-5	Styrene		<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U
98-06-6	tert-Butylbenzene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	0.250	J	<0.500	U
127-18-4	Tetrachloroethene	5[(1)]	1.30		1.19		**7.62**		3.55		3.54		0.940	J	1.14		3.44	
108-88-3	Toluene		<0.500	U	<0.500	U	0.268	J	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
156-60-5	trans-1,2-Dichloroethene		2.13		2.33		4.35		2.46		2.48		1.23		2.00		5.42	
10061-02-6	trans-1,3-Dichloropropene		<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
79-01-6	Trichloroethene	5[(1)]	**3540**		**3440**		**4260**		**5380**		**4580**		**2930**		**3040**		**5550**	
75-69-4	Trichlorofluoromethane		<0.500	U	<0.500	U	0.275	J	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
108-05-4	Vinyl acetate		<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	UJ	<5.00	UJ	<5.00	U
75-01-4	Vinyl chloride*	2[(1)]	1.34		1.36		**3.98**		1.52		1.46		0.647	J	0.969	J	**2.04**	

DPT Groundwater Results

Chemical Abstracts Service Number	Chemical Name	Sample ID	1824DPT14		1824DPT15		1824DPT16		1824DPT17		1824DPT18		1824DPT19		1824DPT20		1824DPT21	
		Collection Date	3/18/2021		3/18/2021		3/18/2021		3/26/2021		3/26/2021		3/26/2021		3/26/2021		3/26/2021	
		Sampled Media	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
		Comparison Level (ug/L)	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier
SW6850 - Perchlorate (ug/L)																		
14797-73-0	Perchlorate	17[2]	**36700**		**51300**		**47900**		**6410**		**148000**		**16200**		**39200**		**33.6**	
SW8260B - VOCs (ug/L)																		
630-20-6	1,1,1,2-Tetrachloroethane		<0.500	U	<0.500	U	<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
71-55-6	1,1,1-Trichloroethane		<0.500	U	<0.500	U	<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
79-34-5	1,1,2,2-Tetrachloroethane		<0.400	U	<0.400	U	<0.400	U	<0.800	U	<0.400	U	<0.800	U	<2.00	U	<0.400	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane		12100		10800		5000	J	101		39.0		268		676		<4.00	U
79-00-5	1,1,2-Trichloroethane	5[1]	0.909	J	0.967	J	0.409	J	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
75-34-3	1,1-Dichloroethane		1.28		1.16		0.416	J	1.02		1.14		<0.500	U	<1.25	U	<0.250	U
75-35-4	1,1-Dichloroethene		51.4		43.1		22.3		2.44	J	1.27	J	<2.00	U	4.10	J	<1.00	U
563-58-6	1,1-Dichloropropene		<0.500	U	<0.500	U	<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
87-61-6	1,2,3-Trichlorobenzene		<0.300	U	<0.300	U	<0.300	U	<0.600	U	<0.300	U	<0.600	U	<1.50	U	<0.300	U
96-18-4	1,2,3-Trichloropropane		<1.00	U	<1.00	U	<1.00	U	<2.00	U	<1.00	U	<2.00	U	<5.00	U	<1.00	U
120-82-1	1,2,4-Trichlorobenzene		<0.400	U	<0.400	U	<0.400	U	<0.800	U	<0.400	U	<0.800	U	<2.00	U	<0.400	U
95-63-6	1,2,4-Trimethylbenzene		<0.500	U	3.20		<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
96-12-8	1,2-Dibromo-3-chloropropane		<2.00	U	<2.00	U	<2.00	U	<4.00	U	<2.00	U	<4.00	U	<10.0	U	<2.00	U
106-93-4	1,2-Dibromoethane		<0.500	U	<0.500	U	<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
95-50-1	1,2-Dichlorobenzene		<0.250	U	<0.250	U	<0.250	U	<0.500	U	<0.250	U	<0.500	U	<1.25	U	<0.250	U
107-06-2	1,2-Dichloroethane		80.3		71.3		41.3		<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
78-87-5	1,2-Dichloropropane		<0.400	U	<0.400	U	<0.400	U	<0.800	U	<0.400	U	<0.800	U	<2.00	U	<0.400	U
108-67-8	1,3,5-Trimethylbenzene		<0.500	U	0.887	J	<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
541-73-1	1,3-Dichlorobenzene		<0.500	U	<0.500	U	<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
142-28-9	1,3-Dichloropropane		<0.400	U	<0.400	U	<0.400	U	<0.800	U	<0.400	U	<0.800	U	<2.00	U	<0.400	U
106-46-7	1,4-Dichlorobenzene		<0.500	U	<0.500	U	<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
594-20-7	2,2-Dichloropropane		<0.500	U	<0.500	U	<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
78-93-3	2-Butanone		<5.00	U	2.52	J+	<5.00	U	<10.0	U	<5.00	U	<10.0	U	<25.0	U	<5.00	U
95-49-8	2-Chlorotoluene		<0.250	U	<0.250	U	<0.250	U	<0.500	U	<0.250	U	<0.500	U	<1.25	U	<0.250	U
591-78-6	2-Hexanone		<5.00	U	<5.00	U	<5.00	U	<10.0	U	<5.00	U	<10.0	U	<25.0	U	3.10	J
106-43-4	4-Chlorotoluene		<0.500	U	<0.500	U	<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
108-10-1	4-Methyl-2-pentanone		<5.00	U	<5.00	U	<5.00	U	<10.0	U	<5.00	U	<10.0	U	<25.0	U	<5.00	U
67-64-1	Acetone		<5.00	U	11.6	J+	<5.00	U	5.32	J	3.71	J	<10.0	U	<25.0	U	2.91	J
71-43-2	Benzene	5[1]	3.25		2.98		1.49		<0.500	U	<0.250	U	<0.500	U	<1.25	U	<0.250	U
108-86-1	Bromobenzene		<0.250	U	<0.250	U	<0.250	U	<0.500	U	<0.250	U	<0.500	U	<1.25	U	<0.250	U
74-97-5	Bromochloromethane		<0.400	U	<0.400	U	<0.400	U	<0.800	U	<0.400	U	<0.800	U	<2.00	U	<0.400	U
75-27-4	Bromodichloromethane	15[2]	<0.500	U	<0.500	U	<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
75-25-2	Bromoform		<1.00	U	<1.00	U	<1.00	U	<2.00	U	<1.00	U	<2.00	U	<5.00	U	<1.00	U
74-83-9	Bromomethane		<1.00	UJ	0.603	J+	<1.00	UJ	<2.00	U	<1.00	U	<2.00	U	<5.00	U	<1.00	U
75-15-0	Carbon disulfide		<1.00	U	<1.00	U	<1.00	U	<2.00	U	<1.00	U	<2.00	U	<5.00	U	<1.00	U
56-23-5	Carbon tetrachloride		7.06		0.505	J	4.84		<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
108-90-7	Chlorobenzene		<0.250	U	<0.250	U	<0.250	U	<0.500	U	<0.250	U	<0.500	U	<1.25	U	<0.250	U
124-48-1	Chlorodibromomethane		<0.500	U	<0.500	U	<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
75-00-3	Chloroethane (Ethyl chloride)		<1.00	U	<1.00	U	<1.00	U	<2.00	U	<1.00	U	<2.00	U	<5.00	U	<1.00	U
67-66-3	Chloroform		34.9		33.7		15.5		1.32		0.390	J	0.260	J	2.05	J	<0.250	U
74-87-3	Chloromethane		<1.00	U	1.04	J+	<1.00	U	<2.00	U	<1.00	U	<2.00	U	<5.00	U	<1.00	U
156-59-2	cis-1,2-Dichloroethene*	70[1]	**120**		37.1		15.9		**135**		14.4		0.780	J	10.3		<0.500	U
10061-01-5	cis-1,3-Dichloropropene		<0.500	U	<0.500	U	<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
74-95-3	Dibromomethane		<0.500	U	<0.500	U	<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
75-71-8	Dichlorodifluoromethane		11.4		39.7		2.88		1.32	J	<0.500	U	<1.00	U	<2.50	U	<0.500	U
100-41-4	Ethylbenzene		<0.500	U	<0.500	U	<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
87-68-3	Hexachlorobutadiene		<0.500	U	<0.500	U	<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
98-82-8	Isopropylbenzene		<0.500	U	<0.500	U	<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
179601-23-1	m-,p-Xylene		<1.00	U	<1.00	U	<1.00	U	<2.00	U	<1.00	U	<2.00	U	<5.00	U	<1.00	U
75-09-2	Methylene chloride	5[1]	1.19		1.13		0.611	J	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
91-20-3	Naphthalene		<0.400	U	1.48		<0.400	U	<0.800	U	<0.400	U	<0.800	U	<2.00	U	<0.400	U
104-51-8	n-Butylbenzene		<0.500	U	<0.500	U	<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U

DPT Groundwater Results

Chemical Abstracts Service Number	Chemical Name	Sample ID	1824DPT14		1824DPT15		1824DPT16		1824DPT17		1824DPT18		1824DPT19		1824DPT20		1824DPT21	
		Collection Date	3/18/2021		3/18/2021		3/18/2021		3/26/2021		3/26/2021		3/26/2021		3/26/2021		3/26/2021	
		Sampled Media	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
		Comparison Level (ug/L)	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier
135-98-8	sec-Butylbenzene		<0.500	U	<0.500	U	<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
100-42-5	Styrene		<0.250	U	<0.250	U	<0.250	U	<0.500	U	<0.250	U	<0.500	U	<1.25	U	<0.250	U
98-06-6	tert-Butylbenzene		<0.500	U	0.450	J	<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
127-18-4	Tetrachloroethene	5[(1)]	**5.26**		4.40		1.22		<1.00	U	0.260	J	<1.00	U	<2.50	U	<0.500	U
108-88-3	Toluene		<0.500	U	<0.500	U	<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
156-60-5	trans-1,2-Dichloroethene		2.81		2.33		1.19		0.820	J	0.460	J	<1.00	U	<2.50	U	<0.500	U
10061-02-6	trans-1,3-Dichloropropene		<1.00	U	<1.00	U	<1.00	U	<2.00	U	<1.00	U	<2.00	U	<5.00	U	<1.00	U
79-01-6	Trichloroethene	5[(1)]	**3810**		**4400**		**2890**		**229**		**135**		**99.5**		**695**		<0.500	U
75-69-4	Trichlorofluoromethane		<0.500	U	<0.500	U	<0.500	U	<1.00	U	<0.500	U	<1.00	U	<2.50	U	<0.500	U
108-05-4	Vinyl acetate		<5.00	UJ	<5.00	UJ	<5.00	UJ	<10.0	UJ	<5.00	UJ	<10.0	UJ	<25.0	UJ	<5.00	UJ
75-01-4	Vinyl chloride*	2[(1)]	1.93		1.07		0.787	J	0.520	J	0.660	J	<1.00	U	<2.50	U	<0.500	U

DPT Groundwater Results

Chemical Abstracts Service Number	Chemical Name	Sample ID	1824DPT22		1824DPT23		1824DPT24		DUP-03		1824DPT25		1824DPT26		1824DPT27		1824DPT27A	
		Collection Date	3/26/2021		3/26/2021		3/18/2021		3/18/2021		3/18/2021		6/16/2021		6/16/2021		6/16/2021	
		Sampled Media	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
		Comparison Level (ug/L)	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier
SW6850 - Perchlorate (ug/L)																		
14797-73-0	Perchlorate	17[2]	**47500**		**65.9**		9.82		**23.5**		**41.7**		**95.6**		1.19	J	9.08	
SW8260B - VOCs (ug/L)																		
630-20-6	1,1,1,2-Tetrachloroethane		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
71-55-6	1,1,1-Trichloroethane		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
79-34-5	1,1,2,2-Tetrachloroethane		<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	UJ	<0.400	UJ	<0.400	UJ
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane		69.4		<4.00	U	<4.00	U	<4.00	U	<4.00	U	<4.00	UJ	<4.00	UJ	<4.00	UJ
79-00-5	1,1,2-Trichloroethane	5[1]	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
75-34-3	1,1-Dichloroethane		<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	UJ	<0.250	UJ	<0.250	UJ
75-35-4	1,1-Dichloroethene		<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	UJ	<1.00	UJ	<1.00	UJ
563-58-6	1,1-Dichloropropene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
87-61-6	1,2,3-Trichlorobenzene		<0.300	U	<0.300	U	<0.300	U	<0.300	U	<0.300	U	<0.300	UJ	<0.300	UJ	<0.300	UJ
96-18-4	1,2,3-Trichloropropane		<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	UJ	<1.00	UJ	<1.00	UJ
120-82-1	1,2,4-Trichlorobenzene		<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	UJ	<0.400	UJ	<0.400	UJ
95-63-6	1,2,4-Trimethylbenzene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
96-12-8	1,2-Dibromo-3-chloropropane		<2.00	U	<2.00	U	<2.00	U	<2.00	U	<2.00	U	<2.00	UJ	<2.00	UJ	<2.00	UJ
106-93-4	1,2-Dibromoethane		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
95-50-1	1,2-Dichlorobenzene		<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	UJ	<0.250	UJ	<0.250	UJ
107-06-2	1,2-Dichloroethane		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
78-87-5	1,2-Dichloropropane		<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	UJ	<0.400	UJ	<0.400	UJ
108-67-8	1,3,5-Trimethylbenzene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
541-73-1	1,3-Dichlorobenzene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
142-28-9	1,3-Dichloropropane		<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	UJ	<0.400	UJ	<0.400	UJ
106-46-7	1,4-Dichlorobenzene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
594-20-7	2,2-Dichloropropane		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
78-93-3	2-Butanone		<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	UJ	<5.00	UJ	<5.00	UJ
95-49-8	2-Chlorotoluene		<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	UJ	<0.250	UJ	<0.250	UJ
591-78-6	2-Hexanone		<5.00	U	2.98	J	<5.00	U	<5.00	U	<5.00	U	<5.00	UJ	<5.00	UJ	<5.00	UJ
106-43-4	4-Chlorotoluene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
108-10-1	4-Methyl-2-pentanone		<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	UJ	<5.00	UJ	<5.00	UJ
67-64-1	Acetone		3.12	J	9.66	J	<5.00	U	3.15	J+	<5.00	U	2.80	J	<5.00	J	<5.00	UJ
71-43-2	Benzene	5[1]	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	UJ	<0.250	UJ	<0.250	UJ
108-86-1	Bromobenzene		<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	UJ	<0.250	UJ	<0.250	UJ
74-97-5	Bromochloromethane		<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	UJ	<0.400	UJ	<0.400	UJ
75-27-4	Bromodichloromethane	15[2]	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
75-25-2	Bromoform		<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	UJ	<1.00	UJ	<1.00	UJ
74-83-9	Bromomethane		<1.00	U	<1.00	U	<1.00	UJ	<1.00	UJ	<1.00	UJ	<1.00	UJ	<1.00	UJ	<1.00	UJ
75-15-0	Carbon disulfide		<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	UJ	<1.00	UJ	<1.00	UJ
56-23-5	Carbon tetrachloride		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
108-90-7	Chlorobenzene		<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	UJ	<0.250	UJ	<0.250	UJ
124-48-1	Chlorodibromomethane		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
75-00-3	Chloroethane (Ethyl chloride)		<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	UJ	<1.00	UJ	<1.00	UJ
67-66-3	Chloroform		<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	UJ	<0.250	UJ	<0.250	UJ
74-87-3	Chloromethane		<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	UJ	<1.00	UJ	<1.00	UJ
156-59-2	cis-1,2-Dichloroethene*	70[1]	1.37		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
10061-01-5	cis-1,3-Dichloropropene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
74-95-3	Dibromomethane		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
75-71-8	Dichlorodifluoromethane		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
100-41-4	Ethylbenzene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
87-68-3	Hexachlorobutadiene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
98-82-8	Isopropylbenzene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
179601-23-1	m-,p-Xylene		<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	UJ	<1.00	UJ	<1.00	UJ
75-09-2	Methylene chloride	5[1]	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
91-20-3	Naphthalene		<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	UJ	<0.400	UJ	<0.400	UJ
104-51-8	n-Butylbenzene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ

DPT Groundwater Results

Chemical Abstracts Service Number	Chemical Name	Sample ID	1824DPT22		1824DPT23		1824DPT24		DUP-03		1824DPT25		1824DPT26		1824DPT27		1824DPT27A	
		Collection Date	3/26/2021		3/26/2021		3/18/2021		3/18/2021		3/18/2021		6/16/2021		6/16/2021		6/16/2021	
		Sampled Media	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
		Comparison Level (ug/L)	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier
135-98-8	sec-Butylbenzene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
100-42-5	Styrene		<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	UJ	<0.250	UJ	<0.250	UJ
98-06-6	tert-Butylbenzene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
127-18-4	Tetrachloroethene	5[(1)]	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
108-88-3	Toluene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
156-60-5	trans-1,2-Dichloroethene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
10061-02-6	trans-1,3-Dichloropropene		<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	UJ	<1.00	UJ	<1.00	UJ
79-01-6	Trichloroethene	5[(1)]	**12.5**		<0.500	U	<0.500	U	<0.500	U	<0.500	U	0.379	J	<0.500	UJ	0.253	J
75-69-4	Trichlorofluoromethane		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ
108-05-4	Vinyl acetate		<5.00	UJ	<5.00	UJ	<5.00	UJ	<5.00	UJ	<5.00	UJ	<5.00	UJ	<5.00	UJ	<5.00	UJ
75-01-4	Vinyl chloride*	2[(1)]	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	UJ	<0.500	UJ	<0.500	UJ

DPT Groundwater Results

Chemical Abstracts Service Number	Chemical Name	Sample ID	1824DPT28		1824DPT29		DUP-07		1824DPT29A		1824DPT30		1824DPT31		DUP-06		1824DPT32	
		Collection Date	6/16/2021		6/12/2021		6/12/2021		6/12/2021		6/12/2021		6/12/2021		6/12/2021		6/12/2021	
		Sampled Media	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
		Comparison Level (ug/L)	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier
SW6850 - Perchlorate (ug/L)																		
14797-73-0	Perchlorate	17[2]	10.6		**41,000**		**39,700**		**5,450**		**35,400**		**11,400**		**11,300**		**26,200**	
SW8260B - VOCs (ug/L)																		
630-20-6	1,1,1,2-Tetrachloroethane		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
71-55-6	1,1,1-Trichloroethane		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
79-34-5	1,1,2,2-Tetrachloroethane		<0.400	UJ	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane		<4.00	UJ	206		196		291		18.4		1100		920	J	10300	
79-00-5	1,1,2-Trichloroethane	5[1]	<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	**5.19**	
75-34-3	1,1-Dichloroethane		<0.250	UJ	3.56		3.80		2.40		0.510		0.930		0.910		3.20	
75-35-4	1,1-Dichloroethene		<1.00	UJ	5.45		5.35		12.4		0.510	J	2.99		2.81		45.7	
563-58-6	1,1-Dichloropropene		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
87-61-6	1,2,3-Trichlorobenzene		<0.300	UJ	<0.300	U	<0.300	U	<0.300	U	<0.300	U	<0.300	U	<0.300	U	<0.300	U
96-18-4	1,2,3-Trichloropropane		<1.00	UJ	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
120-82-1	1,2,4-Trichlorobenzene		<0.400	UJ	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
95-63-6	1,2,4-Trimethylbenzene		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	0.350	J
96-12-8	1,2-Dibromo-3-chloropropane		<2.00	UJ	<2.00	U	<2.00	U	<2.00	U	<2.00	U	<2.00	U	<2.00	U	<2.00	U
106-93-4	1,2-Dibromoethane		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
95-50-1	1,2-Dichlorobenzene		<0.250	UJ	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	0.500	
107-06-2	1,2-Dichloroethane		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	780	
78-87-5	1,2-Dichloropropane		<0.400	UJ	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
108-67-8	1,3,5-Trimethylbenzene		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
541-73-1	1,3-Dichlorobenzene		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
142-28-9	1,3-Dichloropropane		<0.400	UJ	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
106-46-7	1,4-Dichlorobenzene		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	0.140	J
594-20-7	2,2-Dichloropropane		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
78-93-3	2-Butanone		<5.00	UJ	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U
95-49-8	2-Chlorotoluene		<0.250	UJ	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U
591-78-6	2-Hexanone		<5.00	UJ	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U
106-43-4	4-Chlorotoluene		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
108-10-1	4-Methyl-2-pentanone		<5.00	UJ	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U
67-64-1	Acetone		5.02	J	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	8.17	J
71-43-2	Benzene	5[1]	<0.250	UJ	<0.250	U	0.240	J	0.210	J	<0.250	U	<0.250	U	<0.250	U	**10.8**	
108-86-1	Bromobenzene		<0.250	UJ	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U
74-97-5	Bromochloromethane		<0.400	UJ	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
75-27-4	Bromodichloromethane	15[2]	<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
75-25-2	Bromoform		<1.00	UJ	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
74-83-9	Bromomethane		<1.00	UJ	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	0.640	J
75-15-0	Carbon disulfide		<1.00	UJ	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
56-23-5	Carbon tetrachloride		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
108-90-7	Chlorobenzene		<0.250	UJ	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U
124-48-1	Chlorodibromomethane		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
75-00-3	Chloroethane (Ethyl chloride)		<1.00	UJ	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
67-66-3	Chloroform		<0.250	UJ	1.76		1.94		0.970		0.450	J	0.470	J	0.410	J	33.0	
74-87-3	Chloromethane		<1.00	UJ	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
156-59-2	cis-1,2-Dichloroethene*	70[1]	<0.500	UJ	48.8		48.9		35.5		4.54		7.82		7.24		**8,800**	
10061-01-5	cis-1,3-Dichloropropene		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
74-95-3	Dibromomethane		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
75-71-8	Dichlorodifluoromethane		<0.500	UJ	1.04		1.21		2.83		<0.500	U	1.00		1.03		27.9	
100-41-4	Ethylbenzene		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
87-68-3	Hexachlorobutadiene		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
98-82-8	Isopropylbenzene		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
179601-23-1	m-,p-Xylene		<1.00	UJ	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	0.550	J
75-09-2	Methylene chloride	5[1]	<0.500	UJ	0.250	J	<0.500	U	0.320	J	0.590	J	0.340	J	0.270	J	4.51	
91-20-3	Naphthalene		<0.400	UJ	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
104-51-8	n-Butylbenzene		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U

DPT Groundwater Results

Chemical Abstracts Service Number	Chemical Name	Sample ID	1824DPT28		1824DPT29		DUP-07		1824DPT29A		1824DPT30		1824DPT31		DUP-06		1824DPT32	
		Collection Date	6/16/2021		6/12/2021		6/12/2021		6/12/2021		6/12/2021		6/12/2021		6/12/2021		6/12/2021	
		Sampled Media	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
		Comparison Level (ug/L)	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier
135-98-8	sec-Butylbenzene		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
100-42-5	Styrene		<0.250	UJ	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U
98-06-6	tert-Butylbenzene		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
127-18-4	Tetrachloroethene	5[1]	<0.500	UJ	0.430	J	0.490	J	0.620	J	<0.500	U	<0.500	U	<0.500	U	3.81	
108-88-3	Toluene		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	0.350	J
156-60-5	trans-1,2-Dichloroethene		<0.500	UJ	1.28		1.40		1.18		<0.500	U	<0.500	U	<0.500	U	26.7	
10061-02-6	trans-1,3-Dichloropropene		<1.00	UJ	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
79-01-6	Trichloroethene	5[1]	<0.500	UJ	**273**		**260**		**193**		**28.8**		**56.4**		**52.6**		**13,400**	
75-69-4	Trichlorofluoromethane		<0.500	UJ	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	1.01	
108-05-4	Vinyl acetate		<5.00	UJ	<5.00	UJ	<5.00	UJ	<5.00	UJ	<5.00	UJ	<5.00	UJ	<5.00	UJ	<5.00	UJ
75-01-4	Vinyl chloride*	2[1]	<0.500	UJ	**21.5**		**21.5**		**10.3**		1.26		**3.99**		**3.85**		**94.6**	

DPT Groundwater Results

Chemical Abstracts Service Number	Chemical Name	Sample ID	1824DPT33		1824DPT34		1824DPT35		1824DPT36		1824DPT37		1824DPT38		1824DPT39		1824DPT40	
		Collection Date	6/12/2021		6/12/2021		6/12/2021		6/12/2021		6/12/2021		6/12/2021		6/12/2021		6/12/2021	
		Sampled Media	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
		Comparison Level (ug/L)	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Per	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier
SW6850 - Perchlorate (ug/L)																		
14797-73-0	Perchlorate	17[2]	**51,500**		**29,500**		**40,600**		**19,100**		**17,400**		**13,300**		**89,000**		**495,000**	
SW8260B - VOCs (ug/L)																		
630-20-6	1,1,1,2-Tetrachloroethane		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
71-55-6	1,1,1-Trichloroethane		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
79-34-5	1,1,2,2-Tetrachloroethane		<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane		30900	J	26900	J	1290		268		851		15.1		830	J	2140	
79-00-5	1,1,2-Trichloroethane	5[1]	1.24		0.740	J	<0.500	U	0.310	J	<0.500	U	<0.500	U	0.460	J	3.54	
75-34-3	1,1-Dichloroethane		1.07		1.09		<0.250	U	0.390	J	<0.250	U	<0.250	U	0.640		2.26	
75-35-4	1,1-Dichloroethene		49.8		51.5		5.14		12.9		3.21		1.59	J	15.3		27.6	
563-58-6	1,1-Dichloropropene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
87-61-6	1,2,3-Trichlorobenzene		<0.300	U	<0.300	U	<0.300	U	<0.300	U	<0.300	U	<0.300	U	<0.300	U	<0.300	U
96-18-4	1,2,3-Trichloropropane		<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
120-82-1	1,2,4-Trichlorobenzene		<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
95-63-6	1,2,4-Trimethylbenzene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	0.690	J
96-12-8	1,2-Dibromo-3-chloropropane		<2.00	U	<2.00	U	<2.00	U	<2.00	U	<2.00	U	<2.00	U	<2.00	U	<2.00	U
106-93-4	1,2-Dibromoethane		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
95-50-1	1,2-Dichlorobenzene		<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	0.150	J
107-06-2	1,2-Dichloroethane		108		54.8		23.5		33.8		2.62		1.09		53.4		233	
78-87-5	1,2-Dichloropropane		<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
108-67-8	1,3,5-Trimethylbenzene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
541-73-1	1,3-Dichlorobenzene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
142-28-9	1,3-Dichloropropane		<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
106-46-7	1,4-Dichlorobenzene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
594-20-7	2,2-Dichloropropane		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
78-93-3	2-Butanone		<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U
95-49-8	2-Chlorotoluene		<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U
591-78-6	2-Hexanone		<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U
106-43-4	4-Chlorotoluene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
108-10-1	4-Methyl-2-pentanone		<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U	<5.00	U
67-64-1	Acetone		<5.00	U	<5.00	U	<5.00	U	6.25	J	<5.00	U	<5.00	U	<5.00	U	<5.00	U
71-43-2	Benzene	5[1]	**6.79**		**20.1**		1.27		2.06		0.310	J	0.240	J	4.28		**31.9**	
108-86-1	Bromobenzene		<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U
74-97-5	Bromochloromethane		<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U
75-27-4	Bromodichloromethane	15[2]	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	0.270	J
75-25-2	Bromoform		<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
74-83-9	Bromomethane		<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
75-15-0	Carbon disulfide		<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
56-23-5	Carbon tetrachloride		53.5		39.2		<0.500	U	19.8		2.25		<0.500	U	12.3		94.6	
108-90-7	Chlorobenzene		<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U
124-48-1	Chlorodibromomethane		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
75-00-3	Chloroethane (Ethyl chloride)		<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
67-66-3	Chloroform		24.1		20.6		5.86		19.5		2.11		2.22		44.0		78.2	
74-87-3	Chloromethane		<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
156-59-2	cis-1,2-Dichloroethene*	70[1]	**140**		**230**		5.78		32.4		4.23		7.65		43.0		**118**	
10061-01-5	cis-1,3-Dichloropropene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
74-95-3	Dibromomethane		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
75-71-8	Dichlorodifluoromethane		18.4		45.8		3.30		2.26		0.430	J	<0.500	U	1.50		3.26	
100-41-4	Ethylbenzene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
87-68-3	Hexachlorobutadiene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
98-82-8	Isopropylbenzene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
179601-23-1	m-,p-Xylene		<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
75-09-2	Methylene chloride	5[1]	1.67		0.980	J	0.340	J	0.740	J	1.31		<0.500	U	1.12		3.54	
91-20-3	Naphthalene		<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	<0.400	U	0.420	J
104-51-8	n-Butylbenzene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U

DPT Groundwater Results

Chemical Abstracts Service Number	Chemical Name	Sample ID	1824DPT33		1824DPT34		1824DPT35		1824DPT36		1824DPT37		1824DPT38		1824DPT39		1824DPT40	
		Collection Date	6/12/2021		6/12/2021		6/12/2021		6/12/2021		6/12/2021		6/12/2021		6/12/2021		6/12/2021	
		Sampled Media	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
		Comparison Level (ug/L)	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Per	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier
135-98-8	sec-Butylbenzene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
100-42-5	Styrene		<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U	<0.250	U
98-06-6	tert-Butylbenzene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
127-18-4	Tetrachloroethene	5[(1)]	**13.9**		**10.2**		0.250	J	0.690	J	<0.500	U	<0.500	U	1.58		**8.94**	
108-88-3	Toluene		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
156-60-5	trans-1,2-Dichloroethene		3.76		1.88		0.640	J	0.300	J	<0.500	U	1.50		0.540	J	2.87	
10061-02-6	trans-1,3-Dichloropropene		<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U	<1.00	U
79-01-6	Trichloroethene	5[(1)]	**6,470**		**4,940**		**1,150**		**2,530**		**279**		**217**		**4,940**	J	**14,000**	J
75-69-4	Trichlorofluoromethane		<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U	<0.500	U
108-05-4	Vinyl acetate		<5.00	UJ	<5.00	UJ	<5.00	UJ	<5.00	UJ	<5.00	UJ	<5.00	UJ	<5.00	UJ	<5.00	UJ
75-01-4	Vinyl chloride*	2[(1)]	**2.40**		**4.68**		<0.500	U	<0.500	U	0.450	J	1.47		<0.500	U	1.02	

DPT Groundwater Results

Chemical Abstracts Service Number	Chemical Name	Sample ID	1824DPT41		1824DPT42	
		Collection Date	6/12/2021		6/12/2021	
		Sampled Media	Groundwater		Groundwater	
		Comparison Level (ug/L)	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier
SW6850 - Perchlorate (ug/L)						
14797-73-0	Perchlorate	17[2]	**124,000**		3,500	
SW8260B - VOCs (ug/L)						
630-20-6	1,1,1,2-Tetrachloroethane		0.320	U	<0.500	U
71-55-6	1,1,1-Trichloroethane		<0.500	U	4.35	
79-34-5	1,1,2,2-Tetrachloroethane		1.14	U	<0.400	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane		291		876	
79-00-5	1,1,2-Trichloroethane	5[1]	**14.2**		1.00	
75-34-3	1,1-Dichloroethane		2.62		21.2	
75-35-4	1,1-Dichloroethene		20.4		88.3	
563-58-6	1,1-Dichloropropene		<0.500	U	<0.500	U
87-61-6	1,2,3-Trichlorobenzene		<0.300	U	<0.300	U
96-18-4	1,2,3-Trichloropropane		<1.00	U	<1.00	U
120-82-1	1,2,4-Trichlorobenzene		<0.400	U	<0.400	U
95-63-6	1,2,4-Trimethylbenzene		<0.500	J	2.17	
96-12-8	1,2-Dibromo-3-chloropropane		<2.00	U	<2.00	U
106-93-4	1,2-Dibromoethane		<0.500	U	<0.500	U
95-50-1	1,2-Dichlorobenzene		0.160	J	<0.250	U
107-06-2	1,2-Dichloroethane		1030		297	
78-87-5	1,2-Dichloropropane		<0.400	U	<0.400	U
108-67-8	1,3,5-Trimethylbenzene		<0.500	U	0.560	J
541-73-1	1,3-Dichlorobenzene		<0.500	U	<0.500	U
142-28-9	1,3-Dichloropropane		<0.400	U	<0.400	U
106-46-7	1,4-Dichlorobenzene		<0.500	U	<0.500	U
594-20-7	2,2-Dichloropropane		<0.500	U	<0.500	U
78-93-3	2-Butanone		<5.00	U	<5.00	U
95-49-8	2-Chlorotoluene		<0.250	U	<0.250	U
591-78-6	2-Hexanone		<5.00	U	<5.00	U
106-43-4	4-Chlorotoluene		<0.500	U	<0.500	U
108-10-1	4-Methyl-2-pentanone		<5.00	U	<5.00	U
67-64-1	Acetone		<5.00	U	<5.00	U
71-43-2	Benzene	5[1]	4.88		0.770	
108-86-1	Bromobenzene		<0.250	U	<0.250	U
74-97-5	Bromochloromethane		<0.400	U	14.8	
75-27-4	Bromodichloromethane	15[2]	<0.500	J	<0.500	U
75-25-2	Bromoform		<1.00	U	<1.00	U
74-83-9	Bromomethane		<1.00	U	<1.00	U
75-15-0	Carbon disulfide		<1.00	U	<1.00	U
56-23-5	Carbon tetrachloride		<0.500		<0.500	U
108-90-7	Chlorobenzene		0.140	U	<0.250	U
124-48-1	Chlorodibromomethane		<0.500	U	<0.500	U
75-00-3	Chloroethane (Ethyl chloride)		<1.00	U	<1.00	U
67-66-3	Chloroform		24.5		3.83	
74-87-3	Chloromethane		<1.00	U	<1.00	U
156-59-2	cis-1,2-Dichloroethene*	70[1]	**202**		**8,730**	
10061-01-5	cis-1,3-Dichloropropene		<0.500	U	<0.500	U
74-95-3	Dibromomethane		<0.500	U	<0.500	U
75-71-8	Dichlorodifluoromethane		0.800		1.37	
100-41-4	Ethylbenzene		<0.500	U	1.68	
87-68-3	Hexachlorobutadiene		<0.500	U	<0.500	U
98-82-8	Isopropylbenzene		0.410	U	0.630	J
179601-23-1	m-,p-Xylene		0.510	U	4.25	
75-09-2	Methylene chloride	5[1]	**7.27**		**6,980**	
91-20-3	Naphthalene		0.280	J	1.01	
104-51-8	n-Butylbenzene		<0.500	U	0.300	J

DPT Groundwater Results

Chemical Abstracts Service Number	Chemical Name	Sample ID	1824DPT41		1824DPT42	
		Collection Date	6/12/2021		6/12/2021	
		Sampled Media	Groundwater		Groundwater	
		Comparison Level (ug/L)	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier
135-98-8	sec-Butylbenzene		<0.500	U	0.290	J
100-42-5	Styrene		<0.250	U	<0.250	U
98-06-6	tert-Butylbenzene		<0.500	U	<0.500	U
127-18-4	Tetrachloroethene	5[(1)]	**15.9**		**15.1**	
108-88-3	Toluene		0.320	U	16.2	
156-60-5	trans-1,2-Dichloroethene		5.11		4.62	
10061-02-6	trans-1,3-Dichloropropene		<1.00	U	<1.00	U
79-01-6	Trichloroethene	5[(1)]	**38,400**	J	**6,860**	
75-69-4	Trichlorofluoromethane		<0.500	U	<0.500	U
108-05-4	Vinyl acetate		<5.00	UJ	<5.00	UJ
75-01-4	Vinyl chloride*	2[(1)]	**18.3**		**648**	

Groundwater Results - Monitoring Wells

Chemical Abstracts Service Number	Chemical Name	Sample ID	1824DPTMW01		1824DPTMW02		1824DPTMW03		1824DPTMW04		1824DPTMW05		1824DPTMW06		DUP-08	
		Collection Date	6/25/2021		6/28/2021		6/30/2021		6/28/2021		6/28/2021		6/29/2021		6/29/2021	
		Sampled Media	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
		Comparison Level (ug/L)	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier
SW6850 - Perchlorate (ug/L)																
14797-73-0	Perchlorate	17[2]	**321**	J	**112,000**	J	4.61	J	**274**	J	**576,000**	J	0.327	J	0.503	J
SW8260B - VOCs (ug/L)																
630-20-6	1,1,1,2-Tetrachloroethane		<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
71-55-6	1,1,1-Trichloroethane		<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
79-34-5	1,1,2,2-Tetrachloroethane		<0.400	U	<2.00	U	<0.400	U	<0.400	U	<20.0	U	<0.400	U	<0.400	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane		<4.00	U	2810		<4.00	U	15.1		1080		<4.00	U	<4.00	U
79-00-5	1,1,2-Trichloroethane	5[1]	<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
75-34-3	1,1-Dichloroethane		<0.250	U	1.10	J	<0.250	U	<0.250	U	<12.5	U	<0.250	U	<0.250	U
75-35-4	1,1-Dichloroethene		<1.00	U	<5.00	U	<1.00	U	<1.00	U	<50.0	U	<1.00	U	<1.00	U
563-58-6	1,1-Dichloropropene		<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
87-61-6	1,2,3-Trichlorobenzene		<0.300	U	<1.50	U	<0.300	U	<0.300	U	<15.0	U	<0.300	U	<0.300	U
96-18-4	1,2,3-Trichloropropane		<1.00	U	<5.00	U	<1.00	U	<1.00	U	<50.0	U	<1.00	U	<1.00	U
120-82-1	1,2,4-Trichlorobenzene		<0.400	U	<2.00	U	<0.400	U	<0.400	U	<20.0	U	<0.400	U	<0.400	U
95-63-6	1,2,4-Trimethylbenzene		<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
96-12-8	1,2-Dibromo-3-chloropropane		<2.00	U	<10.0	U	<2.00	U	<2.00	U	<100	U	<2.00	U	<2.00	U
106-93-4	1,2-Dibromoethane		<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
95-50-1	1,2-Dichlorobenzene		<0.250	U	<1.25	U	<0.250	U	<0.250	U	<12.5	U	<0.250	U	<0.250	U
107-06-2	1,2-Dichloroethane		<0.500	U	<2.50	U	<0.500	U	<0.500	U	122		0.370	J	0.470	J
78-87-5	1,2-Dichloropropane		<0.400	U	<2.00	U	<0.400	U	<0.400	U	<20.0	U	<0.400	U	<0.400	U
108-67-8	1,3,5-Trimethylbenzene		<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
541-73-1	1,3-Dichlorobenzene		<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
142-28-9	1,3-Dichloropropane		<0.400	U	<2.00	U	<0.400	U	<0.400	U	<20.0	U	<0.400	U	<0.400	U
106-46-7	1,4-Dichlorobenzene		<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
594-20-7	2,2-Dichloropropane		<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
78-93-3	2-Butanone		<5.00	U	<25.0	U	<5.00	U	<5.00	U	<250	U	<5.00	U	<5.00	U
95-49-8	2-Chlorotoluene		<0.250	U	<1.25	U	<0.250	U	<0.250	U	<12.5	U	<0.250	U	<0.250	U
591-78-6	2-Hexanone		<5.00	U	<25.0	U	<5.00	U	<5.00	U	<250	U	<5.00	U	<5.00	U
106-43-4	4-Chlorotoluene		<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
108-10-1	4-Methyl-2-pentanone		<5.00	U	<25.0	U	<5.00	U	<5.00	U	<250	U	<5.00	U	<5.00	U
67-64-1	Acetone		<5.00	U	<25.0	U	2.73	J	<5.00	U	<250	U	3.96	J	3.89	J
71-43-2	Benzene	5[1]	<0.250	U	<1.25	U	<0.250	U	<0.250	U	**26.5**		<0.250	U	<0.250	U
108-86-1	Bromobenzene		<0.250	U	<1.25	U	<0.250	U	<0.250	U	<12.5	U	<0.250	U	<0.250	U
74-97-5	Bromochloromethane		<0.400	U	<2.00	U	0.570	J	<0.400	U	<20.0	U	<0.400	U	<0.400	U
75-27-4	Bromodichloromethane	15[2]	0.510	J	<2.50	U	1.58		<0.500	U	<25.0	U	<0.500	U	<0.500	U
75-25-2	Bromoform		1.90	J	<5.00	U	4.07		0.570	J	<50.0	U	<1.00	U	<1.00	U
74-83-9	Bromomethane		<1.00	U	<5.00	U	<1.00	U	<1.00	U	<50.0	U	<1.00	U	<1.00	U
75-15-0	Carbon disulfide		<1.00	U	<5.00	U	<1.00	U	<1.00	U	<50.0	U	<1.00	U	0.570	J
56-23-5	Carbon tetrachloride		<0.500	U	<2.50	U	<0.500	U	<0.500	U	38.0	J	<0.500	U	<0.500	U
108-90-7	Chlorobenzene		<0.250	U	<1.25	U	<0.250	U	<0.250	U	<12.5	U	<0.250	U	<0.250	U
124-48-1	Chlorodibromomethane		1.56		<2.50	U	3.86		0.320	J	<25.0	U	<0.500	U	<0.500	U
75-00-3	Chloroethane (Ethyl chloride)		<1.00	U	<5.00	U	<1.00	U	<1.00	U	<50.0	U	<1.00	U	<1.00	U
67-66-3	Chloroform		<0.250	U	<1.25	U	0.890		<0.250	U	30.0		<0.250	U	<0.250	U
74-87-3	Chloromethane		<1.00	U	<5.00	U	<1.00	U	<1.00	U	<50.0	U	<1.00	U	<1.00	U
156-59-2	cis-1,2-Dichloroethene	70[1]	<0.500	U	26.0		<0.500	U	<0.500	U	50.0		5.31		5.92	
10061-01-5	cis-1,3-Dichloropropene		<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U

Groundwater Results - Monitoring Wells

Chemical Abstracts Service Number	Chemical Name	Sample ID	1824DPTMW01		1824DPTMW02		1824DPTMW03		1824DPTMW04		1824DPTMW05		1824DPTMW06		DUP-08	
		Collection Date	6/25/2021		6/28/2021		6/30/2021		6/28/2021		6/28/2021		6/29/2021		6/29/2021	
		Sampled Media	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
		Comparison Level (ug/L)	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier	Result (ug/L)	Qualifier
87-68-3	Hexachlorobutadiene		<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
98-82-8	Isopropylbenzene		<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
179601-23-1	m-,p-Xylene		<1.00	U	<5.00	U	<1.00	U	<1.00	U	<50.0	U	<1.00	U	<1.00	U
75-09-2	Methylene chloride	5[1]	<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
91-20-3	Naphthalene		<0.400	U	<2.00	U	0.420	J	<0.400	U	<20.0	U	<0.400	U	<0.400	U
104-51-8	n-Butylbenzene		<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
103-65-1	n-Propylbenzene		<0.250	U	<1.25	U	<0.250	U	<0.250	U	<12.5	U	<0.250	U	<0.250	U
95-47-6	o-Xylene		<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
99-87-6	p-Isopropyltoluene		<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
135-98-8	sec-Butylbenzene		<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
100-42-5	Styrene		<0.250	U	<1.25	U	<0.250	U	<0.250	U	<12.5	U	<0.250	U	<0.250	U
98-06-6	tert-Butylbenzene		<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
127-18-4	Tetrachloroethene	5[1]	<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
108-88-3	Toluene		<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
156-60-5	trans-1,2-Dichloroethene		<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
10061-02-6	trans-1,3-Dichloropropene		<1.00	U	<5.00	U	<1.00	U	<1.00	U	<50.0	U	<1.00	U	<1.00	U
79-01-6	Trichloroethene	5[1]	<0.500	U	**466**		0.880	J	1.21		**8890**		**37.3**	J	**39.2**	
75-69-4	Trichlorofluoromethane		<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
108-05-4	Vinyl acetate		<5.00	UJ	<25.0	UJ	<5.00	UJ	<5.00	UJ	<250	UJ	<5.00	UJ	<5.00	UJ
75-01-4	Vinyl chloride	2[1]	<0.500	U	<2.50	U	<0.500	U	<0.500	U	<25.0	U	<0.500	U	<0.500	U
123-91-1	1,4-Dioxane	9.1[2]	NA		NA		NA		NA		NA		6.13	J	5.32	J+

Attachment 9. Field Activities Photo Log

Completed monitoring well 1824DPTMW01

Monitoring well 1824DPTMW01 DPT cores.

Monitoring well 1824DPTMW01 purge water.

Completed monitoring well 1824DPTMW05.

Monitoring well 1824DPTMW05 DPT cores.

Monitoring well 1824DPTMW05 purge water.

Site conditions Outside the ICT Boundary.

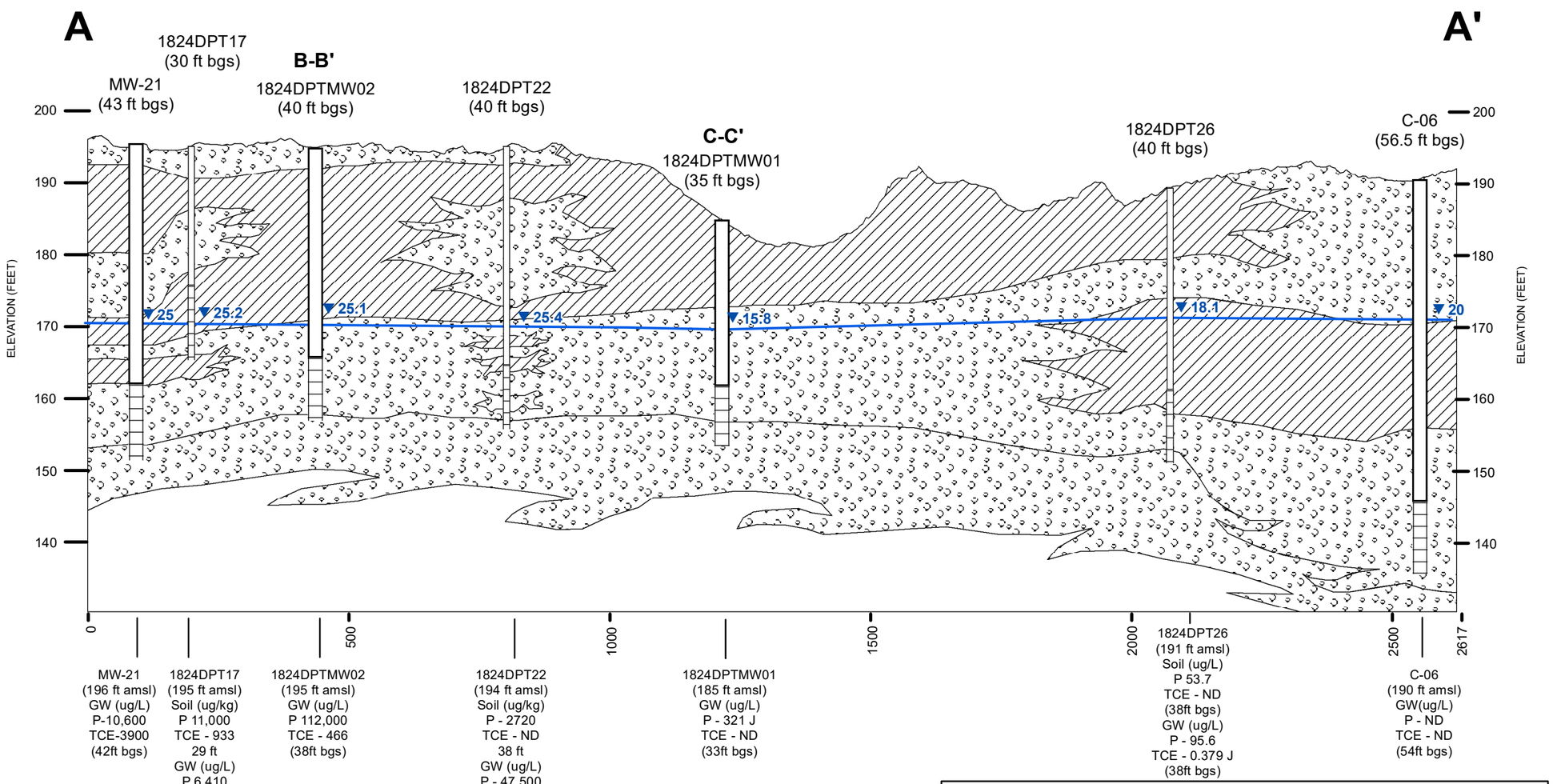
Clearing access to the area Outside the ICT Boundary.

Laying drilling mats Outside the ICT Boundary.

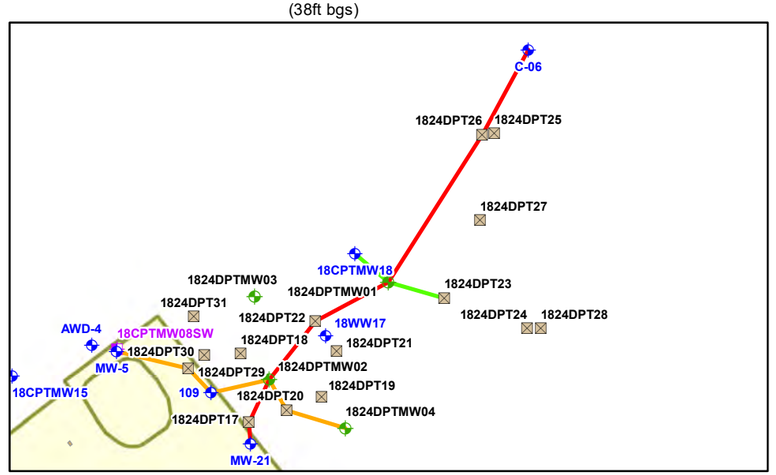
Drilling on mats Outside the ICT Boundary.

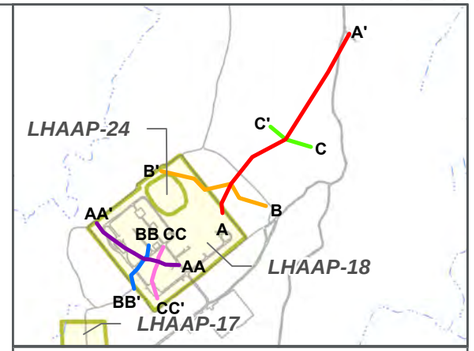
Attachment 10. Cross Sections – Outside Northeast ICT Boundary and Shallow Zone ISB Grids

SCALE: HORIZONTAL AND VERTICAL AS SHOWN



RESULTS FORMAT
Groundwater Elevation - feet above mean sea level (amsl).
Trichloroethene (TCE) - Soil
Perchlorate (P) - Soil
TCE and P in Groundwater (GW ug/L)
TCE and P in Soil (ug/kg)
(42 ft bgs) - depth groundwater sample collected
29 ft - depth soil sample collected





LEGEND

- screen
- well
- clay
- sand
- Groundwater Depth (ft bgs)
- Groundwater Table Line
- New Monitoring Well Locations
- New DPT Locations
- Shallow Zone Monitor Well
- Wilcox Formation Monitoring Well

Cross Sections

- A-A'
- B-B'
- C-C'

NOTES: Groundwater results reported in micrograms per liter
Soil results reported in milligrams per kilogram
ND- Nondetect
J- Estimated
S- Shallow monitoring well
UI- Upper Intermediate monitoring well

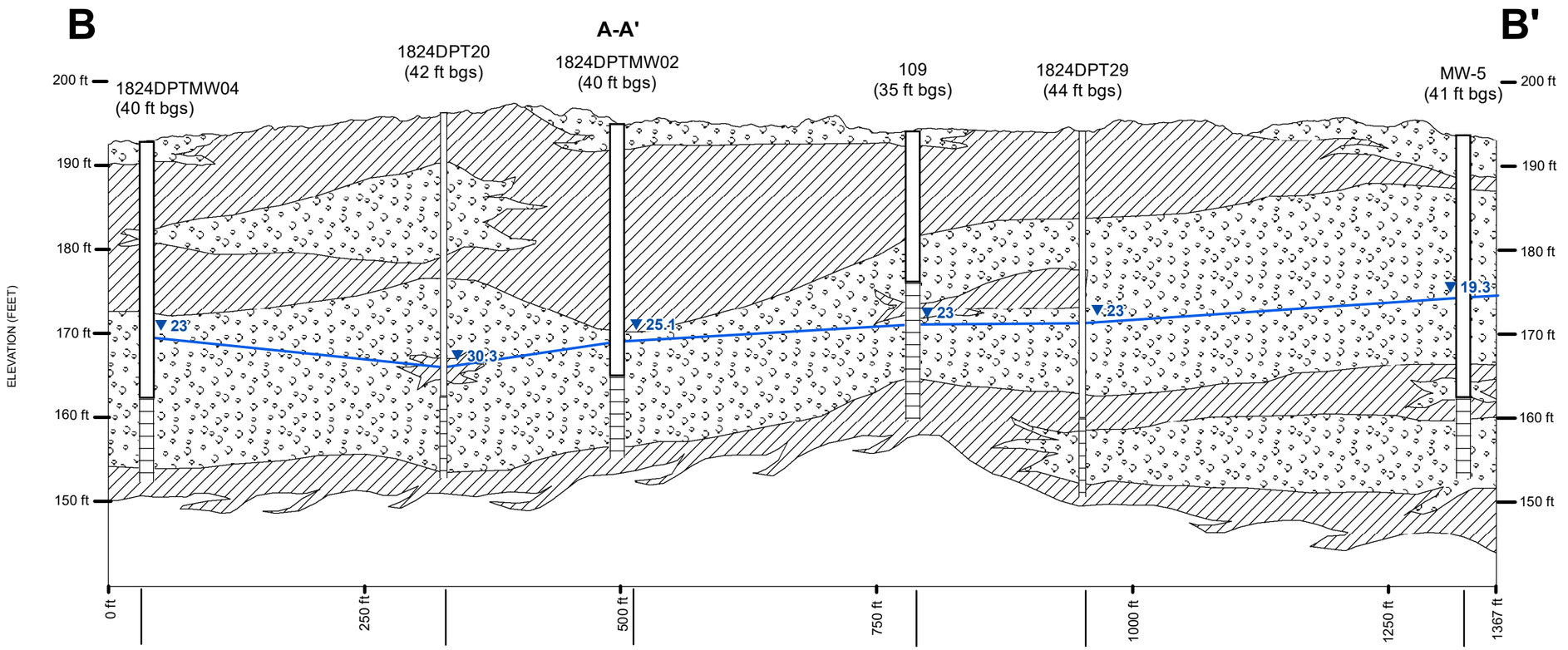
HDR data collected May (soil) - June (groundwater) 2021.
BHATE data (groundwater) collected June 2021.

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

GEOLOGICAL CROSS-SECTION A-A'

LHAAP-18/24
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

SCALE: HORIZONTAL AND VERTICAL AS SHOWN



1824 DPTMW04
(193 ft amsl)
Groundwater(ug/L)
38'bgs
Perchlorate - 274 J
TCE - 1.21

1824 DPT20
(194 ft amsl)
Soil(mg/bg)
41'bgs
Perchlorate - 2,800
TCE - 12.3
Groundwater(ug/L)
40'bgs
Perchlorate - 39,200
TCE - 695

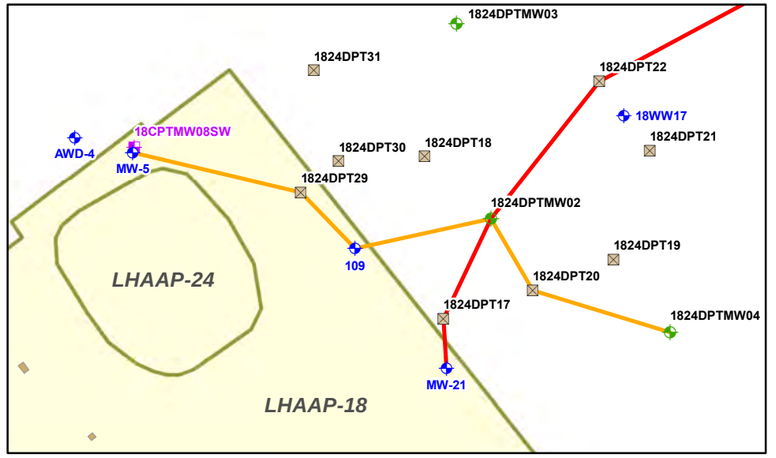
1824 DPTMW02
(195 ft amsl)
Groundwater(ug/L)
38'bgs
Perchlorate - 112,000 J
TCE - 466

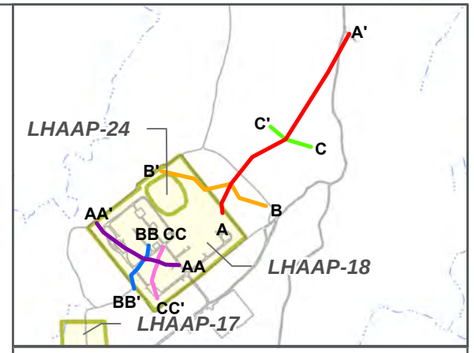
109
(194 ft amsl)
Groundwater(ug/L)
33'bgs
Perchlorate - 20,400
TCE - 240

1824 DPT29
(194 ft amsl)
Soil (mg/kg)
40'bgs
Perchlorate 10,200
TCE - 16.8
Groundwater(ug/L)
41'bgs
Perchlorate - 41,000
TCE - 273

1824 DPTMW04
(193 ft amsl)
Groundwater(ug/L)
38'bgs
Perchlorate 22,300
TCE 40

RESULTS FORMAT
Groundwater Elevation - feet above mean sea level (amsl).
Trichloroethene (TCE) - Soil
Perchlorate (P) - Soil
TCE and P in Groundwater (GW ug/L)
TCE and P in Soil (ug/kg)
(42 ft bgs) - depth groundwater sample collected
29 ft - depth soil sample collected





LEGEND

- screen
- well
- clay
- sand
- Groundwater Depth (ft bgs)
- Groundwater Table Line
- New Monitoring Well Locations
- New DPT Locations
- Shallow Zone Monitor Well
- Wilcox Formation Monitoring Well

Cross Sections

- A-A'
- B-B'
- C-C'

NOTES: Groundwater results reported in micrograms per liter
Soil results reported in milligrams per kilogram
ND- Nondetect
J- Estimated
S- Shallow monitoring well
UI- Upper Intermediate monitoring well

HDR data collected May (soil) - June (groundwater) 2021.
BHATE data (groundwater) collected June 2021.

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

GEOLOGICAL CROSS-SECTION B-B'

LHAAP-18/24
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

SCALE: HORIZONTAL AND VERTICAL AS SHOWN

C

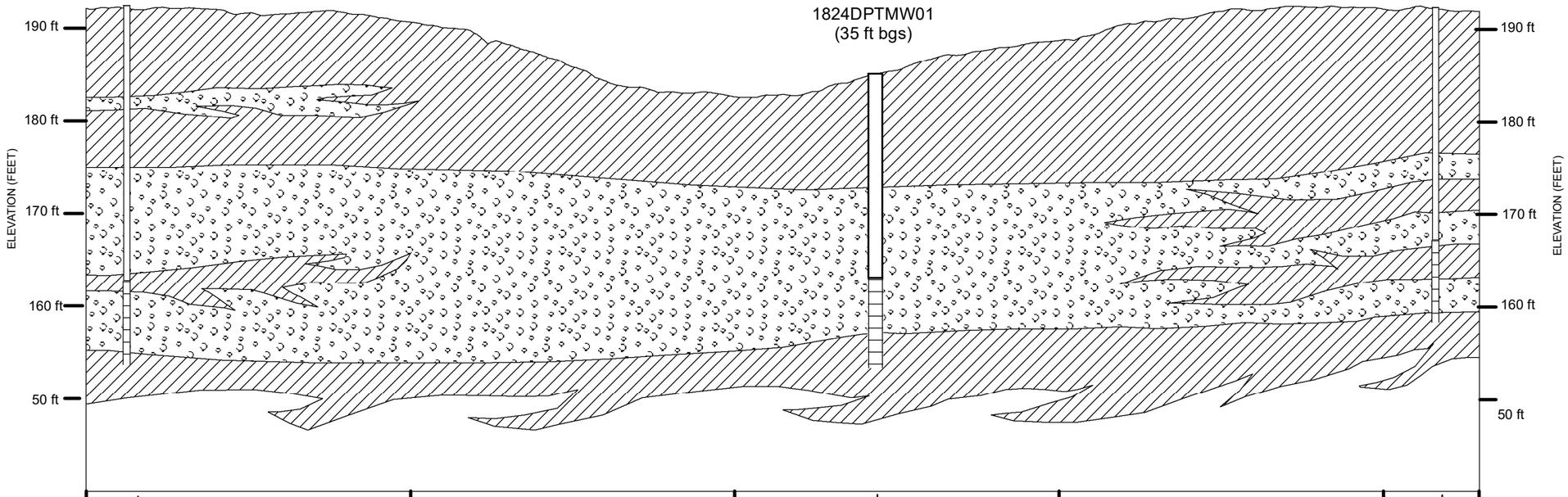
C'

A-A'

1824DPT23
(39 ft bgs)

1824DPTMW01
(35 ft bgs)

18CPTMW18
(34 ft bgs)

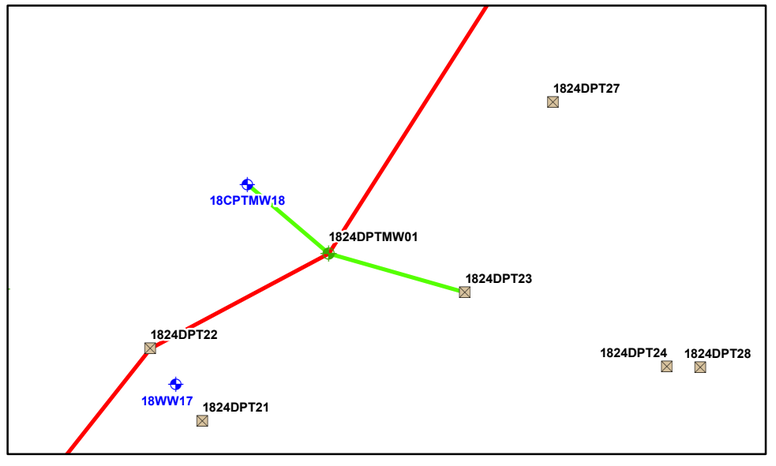


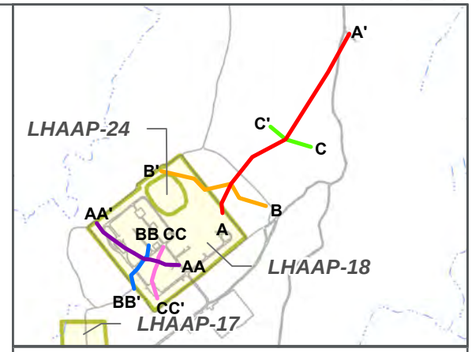
1824DPT23
(192 ft amsl)
Soil(ug/mg)
Perchlorate - 1.38 J
TCE - ND
Groundwater (ug/L)
Perchlorate - 65.9
TCE - ND

1824DPTMW01
(185 ft amsl)
Groundwater (ug/L)
33 bgs
Perchlorate - 321 J
TCE - ND

18CPTMW18
(192 ft amsl)
Groundwater (ug/L)
Perchlorate - ND
TCE - ND

RESULTS FORMAT
Groundwater Elevation - feet above mean sea level (amsl).
Trichloroethene (TCE) - Soil
Perchlorate (P) - Soil
TCE and P in Groundwater (GW ug/L)
TCE and P in Soil (ug/kg)
(42 ft bgs) - depth groundwater sample collected
29 ft - depth soil sample collected





LEGEND

- screen
- well
- clay
- sand
- New Monitoring Well Locations
- New DPT Locations
- Shallow Zone Monitor Well
- Wilcox Formation Monitoring Well

Cross Sections

- A-A'
- B-B'
- C-C'

NOTES: Groundwater results reported in micrograms per liter
Soil results reported in milligrams per kilogram
ND- Nondetect
J- Estimated
S- Shallow monitoring well
UI- Upper Intermediate monitoring well

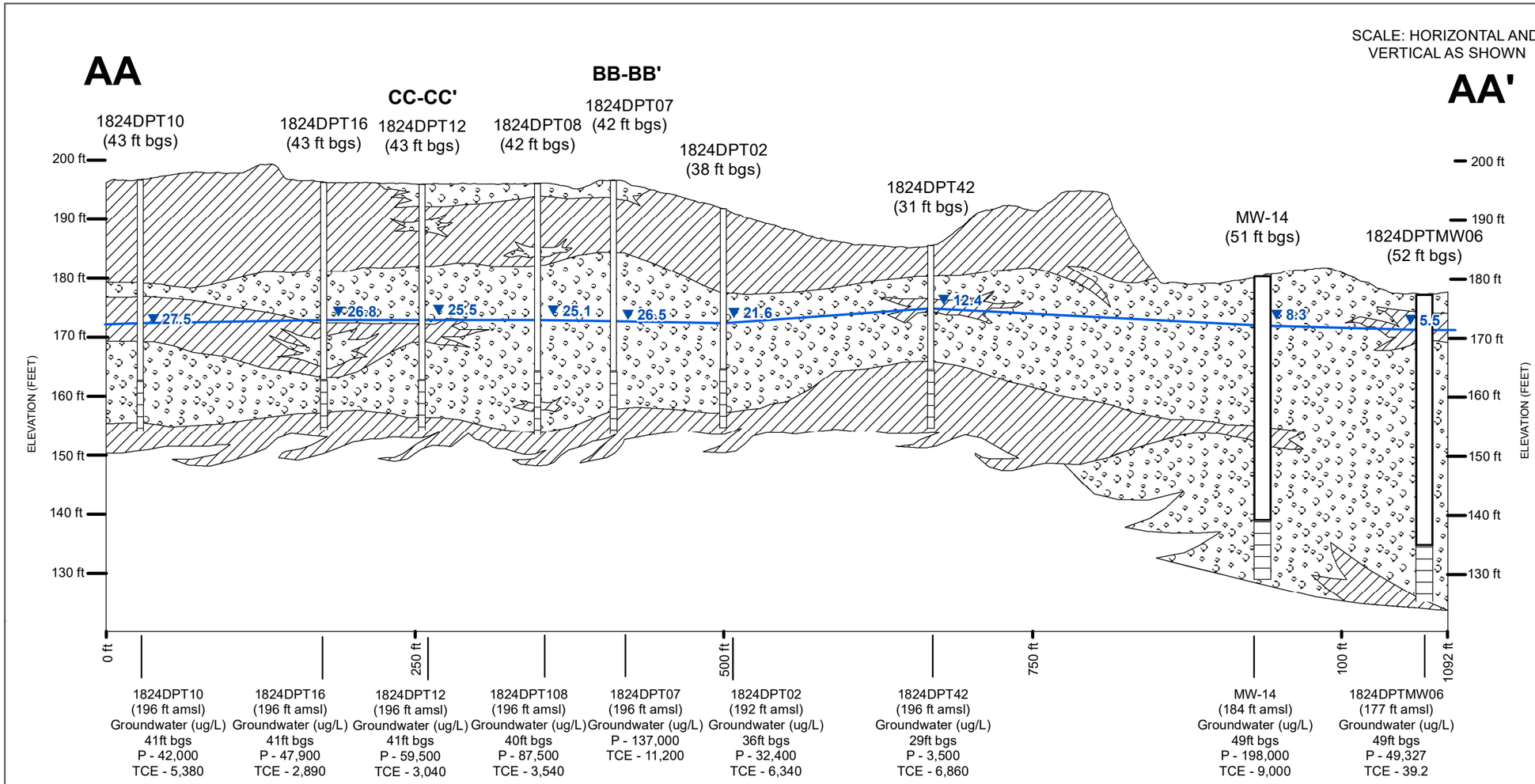
HDR data collected May (soil) - June (groundwater) 2021.
BHATE data (groundwater) collected June 2021.

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

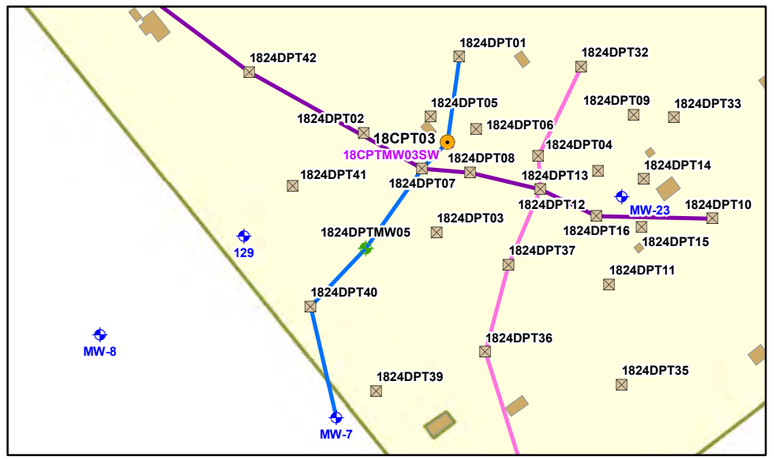
GEOLOGICAL CROSS-SECTION C-C'

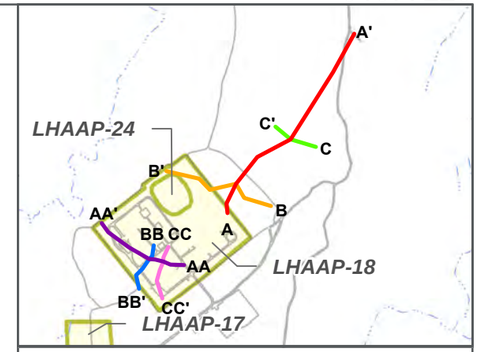
LHAAP-18/24
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

SCALE: HORIZONTAL AND VERTICAL AS SHOWN



RESULTS FORMAT
Groundwater Elevation - feet above mean sea level (amsl).
Trichloroethene (TCE) - Soil
Perchlorate (P) - Soil
TCE and P in Groundwater (GW ug/L)
TCE and P in Soil (ug/kg)
(42 ft bgs) - depth groundwater sample collected
29 ft - depth soil sample collected





LEGEND

- screen
- well
- clay
- sand
- Groundwater Depth (ft bgs)
- Groundwater Table Line
- New Monitoring Well Locations
- New DPT Locations
- Shallow Zone Monitor Well
- Wilcox Formation Monitoring Well

Cross Sections

- AA-AA'
- BB_BB'
- CC-CC'

NOTES: Groundwater results reported in micrograms per liter
Soil results reported in milligrams per kilogram
ND- Nondetect
J- Estimated
S- Shallow monitoring well
UI- Upper Intermediate monitoring well

HDR data collected May (soil) - June (groundwater) 2021.
BHATE data (groundwater) collected June 2021.

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

GEOLOGICAL CROSS-SECTION AA-AA'

LHAAP-18/24
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

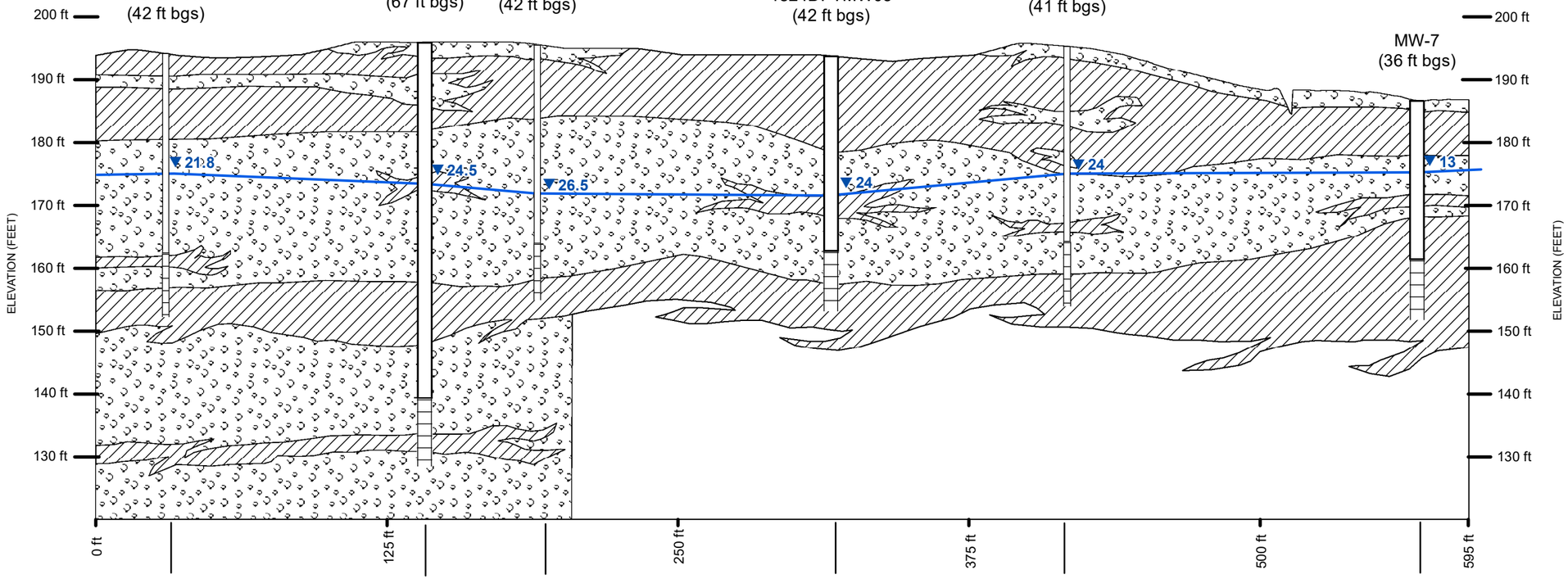
PATH: J:\2018\18-025_LHAAP_SITES29_47_18AND24_ROD_(WERNER)\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\LHAAP18_24\PDI_2021\LHAAP_18_42_SITE_XSECTION_AA-AA.MXD - USER: KLOFGREN - DATE: 11/10/2021

BB

SCALE: HORIZONTAL AND VERTICAL AS SHOWN

BB'

AA-AA'



1824DPT01
(194 ft amsl)
Groundwater (ug/L)
40' bgs
P - 2,350
TCE - 7,530

18CPTMW03SW
(196 ft amsl)
Groundwater (ug/L)
70' bgs
P - 0.65
TCE - 18

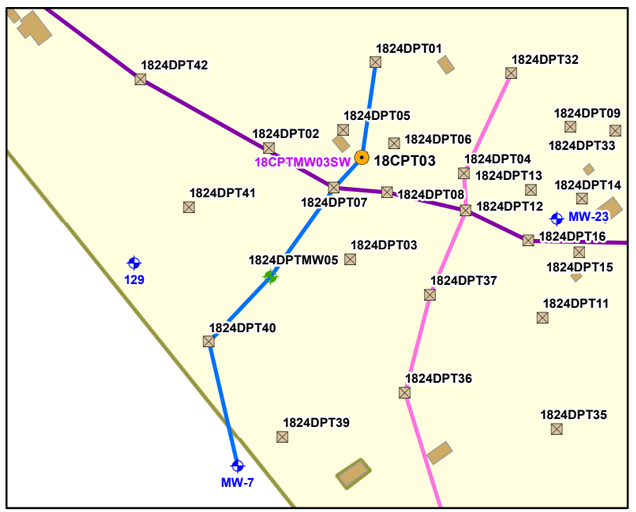
1824DPT07
(196 ft amsl)
Groundwater (ug/L)
40' bgs
P - 137,000
TCE - 11,200

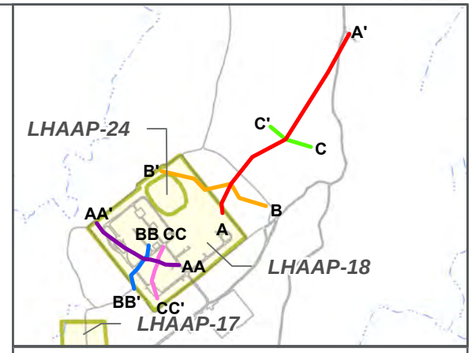
1824DPTMW05
(194.5 ft amsl)
Groundwater (ug/L)
40' bgs
P - 576,000
TCE - 8,890

1824DPT40
(196 ft amsl)
Groundwater (ug/L)
39' bgs
P - 495,000
TCE - 14,000

MW-7
(187 ft amsl)
Groundwater (ug/L)
23' bgs
P - 13,100
TCE - 2,000

RESULTS FORMAT
Groundwater Elevation - feet above mean sea level (amsl).
Trichloroethene (TCE) - Soil
Perchlorate (P) - Soil
TCE and P in Groundwater (GW ug/L)
TCE and P in Soil (ug/kg)
(42 ft bgs) - depth groundwater sample collected
29 ft - depth soil sample collected





LEGEND

- screen
- well
- clay
- sand
- Groundwater Depth (ft bgs)
- Groundwater Table Line
- New Monitoring Well Locations
- New DPT Locations
- Shallow Zone Monitor Well
- Wilcox Formation Monitoring Well

Cross Sections

- AA-AA'
- BB_BB'
- CC-CC'

NOTES: Groundwater results reported in micrograms per liter
Soil results reported in milligrams per kilogram
ND- Nondetect
J- Estimated
S- Shallow monitoring well
UI- Upper Intermediate monitoring well

HDR data collected May (soil) - June (groundwater) 2021.
BHATE data (groundwater) collected June 2021.

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

GEOLOGICAL CROSS-SECTION BB-BB'

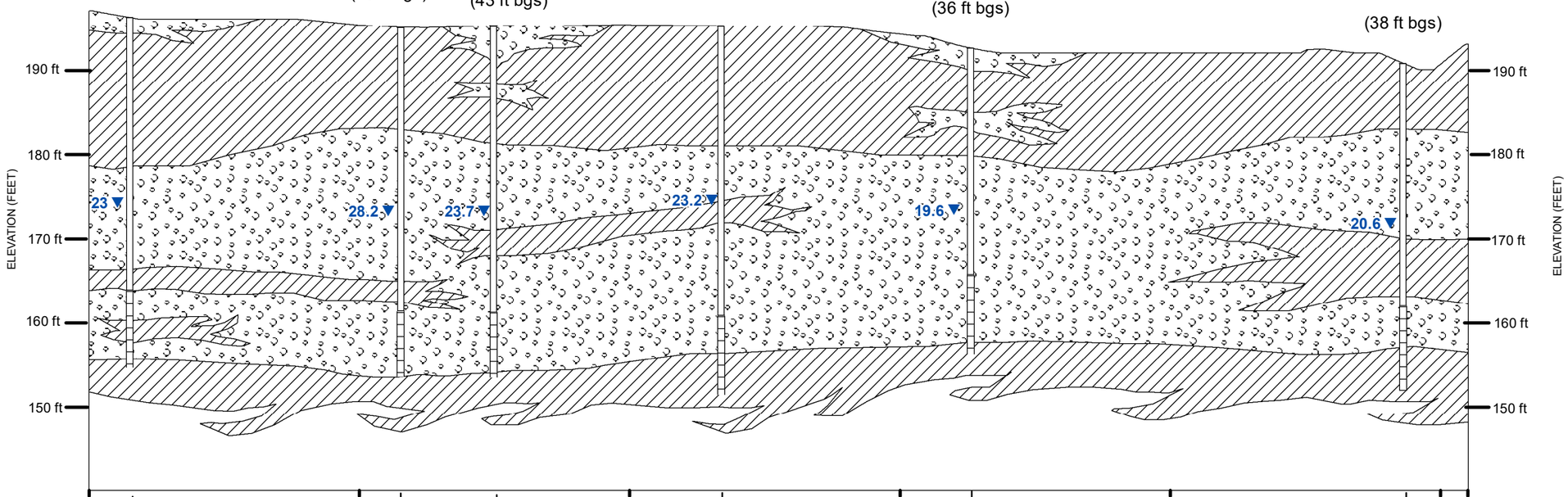
LHAAP-18/24
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

CC

SCALE: HORIZONTAL AND VERTICAL AS SHOWN

CC'

AA-AA'



1824DPT32
(197 ft amsl)
Groundwater (ug/L)
(40ft bgs)
P - 26,200
TCE - 13,400

1824DPT32
(197 ft amsl)
Groundwater (ug/L)
(41ft bgs)
P - 85,000
TCE - 5,620

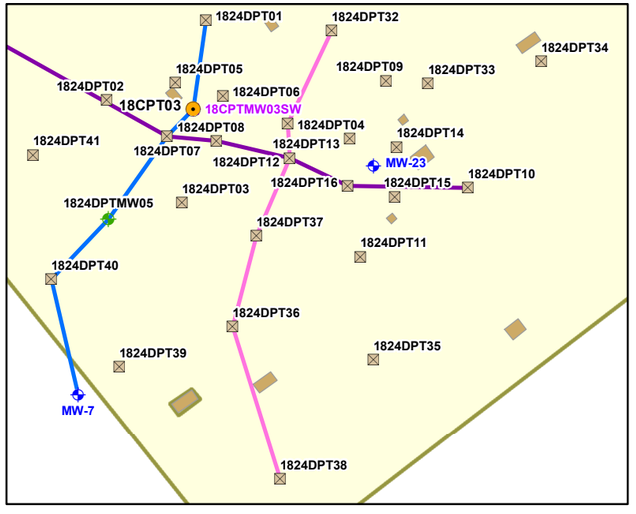
1824DPT12
(196 ft amsl)
Groundwater (ug/L)
(41 ft bgs)
P - 59,500
TCE - 3,040

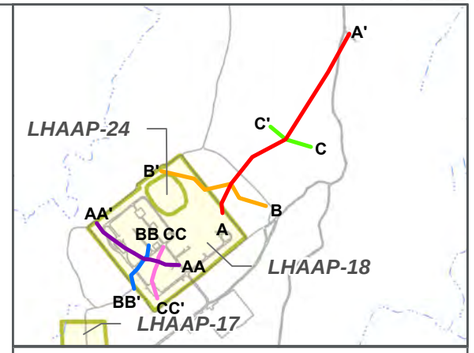
1824DPT37
(196 ft amsl)
Groundwater (ug/L)
(42ft bgs)
P - 17,400
TCE - 279

1824DPT36
(193 ft amsl)
Groundwater (ug/L)
(34ft bgs)
P - 19,100
TCE - 2,530

1824DPT38
(192 ft amsl)
Groundwater (ug/L)
(36ft bgs)
P - 13,300
TCE - 217

RESULTS FORMAT
Groundwater Elevation - feet above mean sea level (amsl).
Trichloroethene (TCE) - Soil
Perchlorate (P) - Soil
TCE and P in Groundwater (GW ug/L)
TCE and P in Soil (ug/kg)
(42 ft bgs) - depth groundwater sample collected
29 ft - depth soil sample collected





LEGEND

- screen
- well
- clay
- sand
- Groundwater Depth (ft bgs)
- Groundwater Table Line
- New Monitoring Well Locations
- New DPT Locations
- Shallow Zone Monitor Well
- Wilcox Formation Monitoring Well

Cross Sections

- AA-AA'
- BB_BB'
- CC-CC'

NOTES: Groundwater results reported in micrograms per liter
Soil results reported in milligrams per kilogram
ND- Nondetect
J- Estimated
S- Shallow monitoring well
UI- Upper Intermediate monitoring well

HDR data collected May (soil) - June (groundwater) 2021.
BHATE data (groundwater) collected June 2021.

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

GEOLOGICAL CROSS-SECTION CC-CC'

LHAAP-18/24
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

March 1, 2022

DAIN-ODB-LO

Mr. Brian Follin
U.S. Environmental Protection Agency
1201 Elm Street, Suite 500
Dallas, TX 75270-2002

Re: Draft Final Seventh Annual Remedial Action Operation Report
LHAAP-50 Former Sump Water Tank
Longhorn Army Ammunition Plant, Karnack, Texas, March 2022

Dear Mr. Follin,

An electronic copy of the above referenced 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 January 31, 2022 and the Texas Commission on Environmental Quality's comment received on February 1, 2022. Tables of responses to the EPA and TCEQ comments on the Draft version are included with this Draft Final document. In accordance with Federal Facility Agreement, this Draft Final will be considered Final after 30 days without further comment.

The document was prepared by Bhate Environmental Associates, Inc., (Bhate) team, on behalf of the Army as part of Bhate's Performance Based Remediation contract for the facility. I ask that Kim Nemmers, Bhate's Project Manager, be copied on any communications related to the project.

The point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.m.zeiler.ctr@army.mil.

Sincerely,

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Electronic Copies furnished:
A. Palmie, TCEQ, Austin, TX
P. Bruckwicki, 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

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

March 1, 2022

DAIN-ODB-LO

Ms. April Palmie
Texas Commission on Environmental Quality
Superfund Section, MC-136
12100 Park 35 Circle, Bldg D
Austin, TX 78753

Re: Draft Final Seventh Annual Remedial Action Operation Report
LHAAP-50 Former Sump Water Tank
Longhorn Army Ammunition Plant, Karnack, Texas, March 2022

Dear Ms. Palmie,

An electronic copy of the above referenced 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 January 31, 2022 and the Texas Commission on Environmental Quality's comment received on February 1, 2022. Tables of responses to the EPA and TCEQ comments on the Draft version are included with this Draft Final document. In accordance with Federal Facility Agreement, this Draft Final will be considered Final after 30 days without further comment.

The document was prepared by Bhate Environmental Associates, Inc., (Bhate) team, on behalf of the Army as part of Bhate's Performance Based Remediation contract for the facility. I ask that Kim Nemmers, Bhate's Project Manager, be copied on any communications related to the project.

The point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.m.zeiler.ctr@army.mil.

Sincerely,

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Electronic Copies furnished:
B. Follin, USEPA Region 6, Dallas, TX
P. Bruckwicki, 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 Seventh Annual Remedial Action Operation Report, LHAAP-50

Submittal Date: December 9, 2021
Comment Date: January 31, 2022

Reviewers: Brian Follin - USEPA
Respondent: Dr. Rose Zeiler - 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 1.2	Insert the word for into the first sentence of this section. "The remedy selected for LHAAP-50 is described in Section 2.9.1 …."	C	Concur, the word "for" will be added to the text.	
2	Section 1.4	May want to indicate that 50WW10 is the only monitoring well in the intermediate zone when listed the number of wells in the different zones.	C	Concur. The paragraph where wells are listed is specific to the 27 new wells that were installed to evaluate the upper and lower portions of the shallow zone. The discussion of 50WW10, three paragraphs below, will be moved to the last sentence of the 4th paragraph and revised as follows: "The depth to groundwater in 50WW10, the intermediate water-bearing zone well, was 22.55 feet bgs in April 2021, indicating confined conditions."	
3	Figure 1-3	Should 47WW38 and LHSMW53 sites be shown on the map?	D	Do not concur. Wells 47WW38 and LHSMW53 are LHAAP-47 wells, that have been used to delineate the LHAAP-50 plumes to the north and northeast.	
		There are 18 upper shallow monitoring wells labeled the map, but one green site is not labeled. Is that 50WW29? A label should be added.	C	Concur. The well in question is 50WW29 and the figure will be revised to include a label for it.	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
		Then, wouldn't the number of wells monitored in the upper shallow zone be 19 wells?	C	Assuming this comment is directed at the well numbers quantified in Section 1.4, see response to comment #2. The number of wells initially installed to evaluate the upper shallow zone was 18. The text will be clarified by adding the following text to the end of the paragraph: "Upper shallow zone monitoring well 50WW29 was installed later to better define the downgradient edge of the plume beyond 50WW12 (Bhate 2019a)."	
4	Figure 1-4	The flow direction symbol is a little difficult to see in this map.	C	Concur. The font for the creek flow arrow will be increased and the arrow will be included in the legend to clarify that the arrow is for the Goose Prairie Creek Flow Direction. This revision will be applied to Figures 1-3, 1-4, and 2-1 through 2-11 for consistency.	
		You cannot see the differences in the perchlorate plume with the trichloroethene plume overlain on the map as well.	C	Concur. The perchlorate plume isoconcentration contour colors on Figure 1-4 will be updated to match the colors shown in the legend and on Figure 2-10 and 2-11. See also the response to TCEQ Comment #1 regarding Figures 2-10 and 2-11.	
5	Section 3.0	There is an extra ")" at the end of the second sentence in the first paragraph.	C	The extra ")" will be deleted.	

Response to Comments on
Draft Seventh Annual Remedial Action Operation Report, LHAAP-50

Submittal Date: December 9, 2022
Comment Date: February 1, 2022

Reviewers: April Palmie - TCEQ
Respondent: Dr. Rose Zeiler - 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	Figure 2-10 and 2-11	The green for TCE concentrations is difficult to see. Suggest a darker shade of green.	C	Concur. The green color for the TCE concentrations will be made darker so that it is easier to read.	

Draft Final
Seventh Annual Remedial Action Operation Report, LHAAP-50 Former Sump Water Tank
Longhorn Army Ammunition Plant
Karnack, Texas

Prepared for

U.S. Army Corps of Engineers, Tulsa District
Contracting Division
2488 East 81st Street
Tulsa, Oklahoma 74137-4290

Prepared by

bhate

1608 13th Avenue South, Suite 300
Birmingham, Alabama 35205
1-800-806-4001 • www.bhate.com

Prepared by

APTIM

Aptim Federal Services, LLC
10333 Richmond Ave, Suite 1030
Houston, Texas 77042

Contract No. W9128F-13-D-0012
Task Order No. W9128BV17F0150
Project No. 501032
Rev 0
March 2022

Table of Contents

List of Tables ..... **ii**
List of Figures ..... **ii**
List of Appendices ..... **ii**
Acronyms and Abbreviations ..... **iii**

1.0 Introduction **1-1**
1.1 Remedial Action Objectives 1-2
1.2 Performance Objectives 1-2
1.3 Site Description 1-4
1.4 Conceptual Site Model 1-4
2.0 Site Activities at LHAAP-50 ..... **2-1**
2.1 Annual LUC Compliance Inspection, Monitoring, and Repair 2-1
2.1.1 Annual LUC Compliance Inspection 2-1
2.1.2 Well Field Operation and Maintenance 2-1
2.2 Groundwater Monitoring 2-1
2.2.1 Groundwater Elevations and Flow Direction 2-2
2.2.2 Groundwater Analytical Results 2-3
2.2.3 Groundwater Monitoring Optimization 2-4
2.3 Surface Water Sampling 2-4
2.4 Well Abandonment 2-5
3.0 Remedy Evaluation **3-1**
3.1 First Line of Evidence: Plume Stability 3-1
3.1.1 Change in COC Concentrations over Time and with Distance 3-1
3.1.2 Plume Extent 3-6
3.2 Second Line of Evidence: Geochemical Indicators 3-8
3.3 Third Line of Evidence: Microbial Analysis and Predictive Modeling 3-10
3.3.1 Microbial Analysis 3-10
3.3.2 Predictive Modeling 3-11
4.0 Summary and Conclusions **4-1**
4.1 Summary 4-1
4.2 Conclusion 4-2
5.0 References **5-1**

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • March 2022

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • March 2022

List of Tables

Table 2-1 ISB Performance Monitoring Network Locations and Analyses
Table 2-2 RA-O / Long-Term Monitoring Network, LHAAP-50
Table 2-3 Groundwater Elevation Data, LHAAP-50
Table 2-4 Year 1 RA-O Analytical Results, LHAAP-50
Table 2-5 Historical COC Concentrations, LHAAP-50
Table 2-6 Groundwater Elevation vs. Bottom of Drainage Channel Elevation, LHAAP-50
Table 3-1 Mann-Kendall Trend Summary, LHAAP-50

List of Figures

Figure 1-1 LHAAP Location Map
Figure 1-2 LHAAP Site Location Map
Figure 1-3 Land Use Control Boundary
Figure 1-4 TCE and Perchlorate Plumes, Baseline
Figure 2-1 RA-O Monitoring Network
Figure 2-2 Shallow Zone Potentiometric Map, Quarter 1
Figure 2-3 Shallow Zone Potentiometric Map, Quarter 2
Figure 2-4 Shallow Zone Potentiometric Map, Quarter 3
Figure 2-5 Shallow Zone Potentiometric Map, Quarter 4
Figure 2-6 COC Concentrations in Groundwater, Quarter 1
Figure 2-7 COC Concentrations in Groundwater, Quarter 2
Figure 2-8 COC Concentrations in Groundwater, Quarter 3
Figure 2-9 COC Concentrations in Groundwater, Quarter 4
Figure 2-10 TCE and Perchlorate Plumes, Quarter 2
Figure 2-11 TCE and Perchlorate Plumes, Quarter 4
Figure 3-1 COC Concentration Trends

List of Appendices

Appendix A Annual Land-Use Control Compliance Certification and Documentation
Appendix B Photographic Log and Well Inspection Forms
Appendix C Groundwater Sampling Forms
Appendix D Laboratory Analytical Data Package
Appendix E Mann-Kendall Trend Test Results

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • March 2022

Acronyms and Abbreviations

§	Section
µg/L	micrograms per liter
1,1-DCE	1,1-dichloroethene
1,2-DCA	1,2-dichloroethane
AECOM	AECOM Technical Services, Inc.
amsl	above mean sea level
APTIM	Aptim Federal Services, LLC
AST	aboveground storage tank
bgs	below ground surface
Bhate	Bhate Environmental Associates, Inc.
cis-1,2-DCE	cis-1,2-dichloroethene
COCs	contaminants of concern
DHC	Dehalococcoides ethenogenes
DO	dissolved oxygen
ESD	Explanation of Significant Differences
ISB	in-situ bioremediation
LHAAP	Longhorn Army Ammunition Plant
LTM	long-term monitoring
LUCs	land use controls
MCLs	maximum contaminant levels
mg/L	milligram(s) per liter
MNA	monitored natural attenuation
mV	millivolts
No.	number
ORP	oxidation-reduction potential
PCE	tetrachloroethene
PCL	protective concentration level
RACR	Remedial Action Completion Report
RA-O	Remedial Action Operation
RAWP	Remedial Action Work Plan
RD	Remedial Design
ROD	Record of Decision
TAC	Texas Administrative Code
TCE	trichloroethene
TCEQ	Texas Commission on Environmental Quality

Acronyms and Abbreviations (continued)

TOC	total organic carbon
U.S.	United States
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VC	vinyl chloride
VOC	volatile organic compound

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • March 2022

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 Number (No.) W9128BV17F0150, to conduct environmental restoration at multiple sites at the former Longhorn Army Ammunition Plant (LHAAP). The Bhate Team consists of Bhate and Aptim Federal Services, LLC (APTIM).

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 north and east. The eastern fence is 3.5 miles from the Texas-Louisiana state border. LHAAP-50 is slated for transfer from the Army to the U.S. Fish and Wildlife Service for incorporation into the Caddo Lake National Wildlife Refuge in the future.

The Draft Final Third Annual Remedial Action Operation (RA-O) Report concluded that monitored natural attenuation (MNA) was ineffective and implementation of a contingency remedy would be appropriate (Bhate 2018a). A Final Explanation of Significant Differences (ESD) was submitted in July 2019 for changes to the Record of Decision (ROD) to implement the in situ bioremediation (ISB) contingency remedy (USACE 2019a). The U.S. Environmental Protection Agency (USEPA) signed the ESD, and the Texas Commission on Environmental Quality (TCEQ) concurred with the USEPA approval in September 2019. The Remedial Design (RD)/Remedial Action Work Plan (RAWP) for the contingency remedy was submitted in December 2019 and approved by USEPA in December 2019 and TCEQ in January 2020 (USACE 2019b). The Year 6 RA-O sampling event in November 2019 was used as the baseline, prior to the ISB groundwater treatment. The ISB injections for the contingency remedy were completed in March 2020 and included injection of the emulsified vegetable oil carbon source (Electron Donor Solution – Extended Release™ from Tersus Environmental, LLC), microbial nutrient (diammonium phosphate), and APTIM's dechlorinating culture (SDC-9™). The implementation of the ISB contingency remedy was reported in the Draft Final Remedial Action Completion Report (RACR) for Contingency Remedy in September 2020 (Bhate 2020).

This Seventh Annual RA-O Report represents the first year of RA-O implementation post-ISB and summarizes the results of the site inspections and sampling activities conducted between

June 2020 and June 2021. The Year 7 RA-O activities consisted of four quarterly sampling events conducted in July 2020, October 2020, January 2021, and April 2021. In accordance with the RD/RAWP, a remedy evaluation of the ISB injections is included in this report.

1.1 Remedial Action Objectives

The remedial action objectives for LHAAP-50, consistent with the reasonably anticipated future use as a national wildlife refuge, are:

- Protection of human health by preventing human exposure to the contaminated groundwater.
- Protection of human health and environment by preventing contaminated groundwater from migrating into nearby surface water.
- Protection of human health by preventing further potential degradation of groundwater and surface water from contaminated soil.
- Return of groundwater to its potential beneficial uses as drinking water, wherever practicable.

1.2 Performance Objectives

The remedy selected for LHAAP-50 is described in Section 2.9.1 of the ROD (USACE 2010) and includes excavation of contaminated soil, MNA of COCs in groundwater, and land use controls (LUC).

Implementation of the excavation, MNA, and LUC remedy was documented in the 2016 RACR (AECOM 2016a). The Final ESD added ISB as a contingency remedy for COCs in groundwater due to the determination that MNA was ineffective (Bhate 2019b). The components of the remedy implemented for groundwater at LHAAP-50 are described in more detail below:

- **LUCs.** LUCs have been implemented for the impacted area as described in the RACR (AECOM 2016a) to ensure the protection of human health by restricting the use of groundwater. The groundwater use restriction will remain in place until the contaminants of concern (COC) in groundwater and soil allow unrestricted use and unlimited exposure.
- **ISB.** The ISB contingency remedy has been implemented in the areas where the highest concentrations were observed, in the upper and lower shallow groundwater in the vicinity of wells 50WW11 and 50WW13, and in the shallow groundwater in the vicinity of well 50WW12. The ISB remedy involved injecting amendments including microbial cultures, electron donor sources, and nutrients into the

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • March 2022

subsurface to remove contaminant mass by enhancing microbial populations that will utilize the contaminants in groundwater during respiratory or metabolic activities. The RACR for the Contingency Remedy (Bhate 2020) documented the implementation of the contingency ISB.

- **MNA.** MNA constitutes a passive treatment where the contaminant concentrations decrease through natural attenuation processes such as biodegradation, dispersion, dilution, sorption, and volatilization (USEPA 1998). MNA was found to be ineffective as the primary remedy for COCs in groundwater and was enhanced with ISB. However, monitoring of MNA processes continues as part of the RA-O.
- **RA-O/LTM.** Data from performance monitoring are used to evaluate whether the ISB and MNA remedies are effectively reducing COCs and that the trichloroethene (TCE) and perchlorate plumes are stable and will not migrate to nearby surface water at levels that may present an unacceptable risk to human health and the environment. RA-O monitoring of the contingency remedy is being conducted quarterly for the first two years post-injection. LTM of the MNA remedy will continue to be conducted annually until the next Five Year Review. A cleanup time has not been estimated and will be evaluated following two years of quarterly post-injection monitoring.

The performance monitoring program and LUC inspection program is provided in the Contingency Remedy RD/RAWP (USACE 2019b). The performance objectives for the operation of the selected remedy 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
  - Restrict land use to nonresidential
- ISB treatment areas 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.

– 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 ISB treatment areas will be based on the two lines of evidence presented in Section 5.3.1 of the Contingency Remedy RD/RAWP (USACE 2019b). The performance of the MNA remedy will continue to be evaluated outside of the treatment areas using the criteria in the 2016 RACR (AECOM 2016a).

1.3 Site Description

LHAAP-50 (former sump water tank) is in the north-central portion of LHAAP and covers an area of approximately 1 acre (**Figure 1-2**). The site is an open area of grass and brush that is bounded by South Crocket Avenue to the northeast, a drainage ditch to the west, a railroad spur to the south, and Goose Prairie Creek to the north. Runoff from the northeastern portion of the site is generally toward the northeast. Runoff is collected by a drainage ditch to the northeast that runs parallel to South Crockett Avenue and eventually joins Goose Prairie Creek. Runoff from the southwestern portion of the site is collected to the west by a drainage ditch that carries the runoff north into Goose Prairie Creek. Goose Prairie Creek eventually empties into Caddo Lake.

When operational, LHAAP-50 contained a 47,000-gallon capacity aboveground storage tank (AST) which received industrial wastewater from various industrial waste production sumps throughout LHAAP between 1955 and 1988. After the solids were filtered, the storage tank contents were discharged into Goose Prairie Creek upstream of the Goose Prairie Creek bridge on South Crockett Avenue, south of 51st Street (**Figure 1-3**). The flow in the creek was sufficient to dilute the water to safe levels (Jacobs 2002). If natural flow in the creek was considered insufficient, clean water was reportedly pumped into the creek to dilute the contents. The AST is no longer present.

The LUC area associated with the groundwater use restriction at LHAAP-50 extends beyond the northern, southern, eastern, and western historical site boundaries and encompasses a total of approximately 77.19 acres (**Figure 1-3**). The nearest significant surface water body to LHAAP-50 is Goose Prairie Creek, located approximately 80 feet north of the site, which eventually flows into Caddo Lake. LHAAP-50 has no known areas of archaeological or historical importance.

1.4 Conceptual Site Model

The nature and extent of contamination at LHAAP-50 were evaluated during field investigations conducted between 1992 and 2010. Releases associated with AST operation are

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • March 2022

the most likely source of contaminants released into the environment. Since the AST has been removed, there is no longer a potential release mechanism for leaks or spills. Perchlorate and volatile organic compounds (VOC) were released via overland spills and discharges to the soil and adjacent surface water.

The COCs at LHAAP-50 include dissolved phase perchlorate and VOCs including tetrachloroethene (PCE), TCE, 1,1-dichloroethene (1,1-DCE), 1,2-dichloroethane (1,2-DCA), cis-1,2-dichloroethene (cis-1,2-DCE), and vinyl chloride (VC) in groundwater, and perchlorate in soil. There are no COCs in other environmental media at the site. The presence of these COCs in the soil and groundwater represents the primary driver for remedial action, as there are no ecological risks at the site. The soil cleanup levels are the Texas Risk Reduction Rules Standard No. 2 industrial medium-specific concentrations. The groundwater cleanup levels are the USEPA maximum contaminant levels (MCL). For perchlorate, the cleanup level is the Texas Risk Reduction Program groundwater residential protective concentration level (PCL).

The area of perchlorate contamination in soil was small, and the concentrations of perchlorate did not pose an unacceptable risk to human health (hypothetical future maintenance worker) or ecological receptors. The perchlorate in soil is no longer present after removal and off-site disposal of approximately 183 cubic yards of perchlorate-contaminated soil in September 2013 as described in the Final RACR (AECOM 2016a). An area of groundwater contamination is observed in the shallow groundwater (upper and lower zones) and poses an unacceptable carcinogenic risk and noncarcinogenic hazard to a future maintenance worker under an industrial exposure scenario. There is no groundwater contamination in the intermediate groundwater zone. The potential exposure pathways are via use of groundwater as drinking water and migration of impacted groundwater into surface water. Shallow groundwater is not used as drinking water at the refuge, and this potential exposure pathway is eliminated from any hypothetical receptor because LUCs are in place that prohibit the use of groundwater other than for environmental monitoring and testing. The nearest significant surface water body to LHAAP-50 is Goose Prairie Creek, approximately 80 feet to the north of the site.

In previous documents, the site hydrogeology was represented as consisting of a shallow zone (approximately 0 to 30 feet below ground surface [bgs]) and an intermediate zone (approximately 35 to 60 feet bgs). Drilling activities, performed during implementation of the remedial action (AECOM 2016a), revealed only a shallow unconfined aquifer extending from ground surface to approximately 60 feet bgs across the site. While intermittent clay layers are present, no true aquiclude exists to prevent vertical communication between ground surface and approximately 60 feet bgs. The intermediate groundwater zone was identified at 100 feet bgs, underlying a dry unit of clay with some interbedded sands. The clay unit is first encountered across the site at approximately 60 feet bgs. The depth to groundwater in

50WW10, the intermediate water-bearing zone well, was 22.55 feet bgs in April 2021, indicating confined conditions.

Because the shallow zone is approximately 60 feet in thickness, the potential for differences in nature and extent of contaminant impacts between upper and lower portions of the shallow zone was recognized. To evaluate this concept, 27 wells were installed in configurations to separately monitor the upper portion of the shallow zone (18 wells) and the lower portion of the shallow zone (6 wells). Additionally, three fully penetrating wells (50WW17, 50WW19, and 50WW20) were installed with screened intervals across the entire saturated shallow zone. Upper shallow zone monitoring well 50WW29 was installed later to better define the downgradient edge of the plume beyond 50WW12 (Bhate 2019a). Monitoring well locations are shown on **Figure 1-3**.

Beginning with the First Annual RA-O Report (AECOM 2016b) and in all future reports, the zone formerly referred to as the shallow zone is referred to as the "upper shallow" zone (0 to 30 feet bgs), and the zone formerly referred to as the intermediate zone is referred to as the "lower shallow" zone (30 to 60 feet bgs). The zone formerly referred to as the deep zone is referred to as the "intermediate" zone (>100 feet bgs).

Based on the groundwater gauging data conducted in April 2021, groundwater in the shallow water-bearing zone ranges from approximately 15.31 feet bgs at 50WW28 to 23.68 feet bgs at 50WW07, flowing to the north within most of the LUC boundary but to the northeast and east-northeast across most of the plume area, with a hydraulic gradient of approximately 0.002 to 0.004 feet per foot.

The Third Annual RA-O Report concluded that MNA was ineffective due the migration of perchlorate away from the original center of the plume. To reduce concentrations and the plume size, the implementation of a contingency remedy was deemed appropriate (Bhate 2018a). The Final ESD was submitted in July 2019 for changes to the ROD to implement the ISB contingency remedy (USACE 2019a). USEPA signed the ESD, and TCEQ concurred with their approval in September 2019. A new well (50WW29) was recommended for installation, as stated above, in the April 2018 Monthly Manager's Meeting to evaluate how far the plumes extend downgradient of 50WW12 (Bhate 2019a). Monitoring well 50WW29 was installed and sampled in August 2019 and November 2019. Details of the well installation, sampling results, and proposed ISB injections were included in the RD/RAWP for the contingency remedy. In November 2019, perchlorate and TCE at 50WW29 were below the detection limit and the MCL. The highest perchlorate concentration in November 2019 was detected in the upper shallow well, 50WW12 at 47,000 micrograms per liter (µg/L) and the highest TCE concentration was detected in the center of the plume at the upper shallow well 50WW13 at 7,300 µg/L in November 2019 (**Figure 1-4**).

The ISB contingency remedy was implemented in March 2020 (**Figure 1-4**) and is documented in the RACR for Contingency Remedy (Bhate 2020). The first quarterly sampling event for the contingency remedy was conducted in July 2020, and the first four quarters of sampling data are summarized in this Annual RA-O Report. 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.

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • March 2022

This page intentionally left blank.

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • March 2022

2.0 SITE ACTIVITIES AT LHAAP-50

2.1 Annual LUC Compliance Inspection, Monitoring, and Repair

2.1.1 Annual LUC Compliance Inspection

The objectives of the LUCs at LHAAP-50 are to prohibit non-residential land use, to prevent human exposure to groundwater contamination presenting an unacceptable risk to human health, and to ensure that there is no withdrawal or use of groundwater beneath the site for anything other than environmental monitoring and testing until the cleanup levels are attained. A restriction against use of groundwater will remain in effect until the levels of COCs in groundwater and soil allow unrestricted use and unlimited exposure.

The LUCs address the area of the LHAAP-50 site that contains shallow zone groundwater VOC and perchlorate contamination. A metes and bounds survey of the 77.19-acre LUC boundary and notices of the groundwater use restrictions accompany all property transfer documents and were recorded at the Harrison County Courthouse in June 2015 in accordance with the Texas Administrative Code (TAC) Title 30, Section (§) 335.566. Additionally, the survey plat, legal boundary, and description of the groundwater restriction, in conjunction with a locator map, were provided to the Texas Department of Licensing and Regulation in June 2015.

A LUC compliance inspection was conducted on September 15, 2020. The Annual LUC Compliance Certification Documentation Form for the Year 7 Annual RA-O period is included in **Appendix A**. No compliance issues, changes in land use, or concerns were noted during the annual inspection.

2.1.2 Well Field Operation and Maintenance

Inspections of the conditions/integrity of monitoring wells are conducted during each sampling event. **Appendix B** includes a photo log and well inspection forms which document the condition of the wells during the inspection. Maintenance or repairs are performed as needed, based on observed conditions. For the seventh annual reporting period, no damage to well bollards, pads, or protective well casings and only minimal encroachment of weeds or brush on the well pads was observed. Mowing the area to control brush and weeds is conducted on a routine basis and as needed to allow access to the wells, typically before sampling events. Mowing was conducted at LHAAP-50 on September 28, 2020.

2.2 Groundwater Monitoring

The seventh annual reporting period includes the period from June 2020 to June 2021 and encompasses the first year of post-injection quarterly monitoring for the ISB contingency

remedy. The RA-O groundwater monitoring network approved in the Draft Final RD/RAWP (USACE 2019b) includes eight wells to be sampled as part of the performance monitoring program to evaluate the ISB remedy on a quarterly basis (**Table 2-1**), and 14 wells to be sampled on an annual basis as part of the RA-O/LTM network (**Table 2-2**). The monitoring well locations are shown on **Figure 2-1**. Quarterly groundwater sampling events for the ISB performance monitoring were conducted in July 2020, October 2020, January 2021, and April 2021. The monitoring wells included in the RA-O/LTM network were sampled during the October 2020 sampling event. The analytes for each well are summarized in **Table 2-1** and **Table 2-2**.

Before collecting groundwater samples, the wells were gauged using a water level probe and both the depth to water and total depth were recorded to the nearest 0.01 foot from the top of casing. Water samples were collected using the low-flow sampling technique as described in the groundwater sampling procedures in the *Final Installation-Wide Work Plan* (Bhate 2018b). The objective of using this method was to collect representative samples of the groundwater in the formation adjacent to the well screen, eliminating the mixing of stagnant water above and below the well screen. After water quality parameters stabilized and were within acceptable ranges per the Work Plan, samples were collected at the same low flow rate.

Groundwater sampling forms are presented in **Appendix C**. Chain-of-custody forms and laboratory reports are presented in **Appendix D**.

2.2.1 Groundwater Elevations and Flow Direction

During the Year 7 RA-O quarterly sampling events, groundwater elevations in each well varied by 0.3 to 4.6 feet throughout the year with the highest groundwater elevations generally occurring during the April 2020 events, near the end of the typically rainy season at LHAAP, and the lowest elevations occurring during the October 2020 event. Groundwater elevations are included in **Table 2-3**. **Figures 2-2** through **2-5** provide potentiometric contour maps for each quarterly event. Monitoring wells screened in the upper shallow zone or fully penetrating the saturated zone were used in the development of the potentiometric contours, while wells that are screened only in the lower shallow zone (50WW06, 50WW09, 50WW14, 50WW25, 50WW26, and 50WW27) were not used. Monitoring wells 50WW02 and 50WW03 were dry during the first three quarters, and 50WW04 was dry during all four quarters.

Shallow groundwater flow at LHAAP-50 during all four quarters was interpreted to flow to the northeast or east within the plume area, with some northerly flow indicated along the southern edge of the site.

2.2.2 Groundwater Analytical Results

Quarterly groundwater samples were collected from eight monitoring wells included in **Table 2-1** and analyzed for perchlorate according to EPA Method 6850 and VOCs (8260C). Five of the eight monitoring wells were sampled for geochemical parameters (ferrous iron, anions, dissolved gases, and total organic carbon [TOC]) as shown in **Table 2-1**. Additionally, a longer list of wells (14 wells) was sampled as part of RA-O/LTM event in Quarter 3 (October 2020). ISB was conducted at LHAAP-50 in the vicinity of 50WW13 and 50WW12 to remediate groundwater impacted with VOCs and perchlorate as shown on **Figure 1-4**.

Analytical results for Quarters 1 through 4 are included in **Table 2-4** and on **Figures 2-6** through **2-9**. TCE and perchlorate plumes for Quarters 2 and 4 are included in **Figures 2-10** and **2-11**. The Quarter 2 sampling event included a longer list of wells (14 wells) sampled as part of the on-going annual RA-O/LTM network and therefore a plume map was created for the Quarter 2 event; the Quarter 4 sampling event conducted in April 2021 was the last RA-O event for Year 1 RA-O and therefore a plume map was created for the Quarter 4 sampling event. Plume maps were not created for Quarters 1 and 3, with a smaller set of sampled locations, for the sake of redundancy. The historical COC concentrations are shown in **Table 2-5**.

Perchlorate, PCE, TCE, 1,2-DCA, 1,1-DCE, VC, and cis-1,2-DCE were detected above their respective cleanup levels in the Year 7 quarterly RA-O sampling at multiple wells.

Year 1, Quarter 1. During the July 2020 sampling event, VOCs were detected above the MCLs at five wells (50WW05, 50WW08, 50WW11, 50WW12, 50WW13) and perchlorate was detected above the PCL at four wells (50WW08, 50WW11, 50WW12, and 50WW13). The maximum TCE concentration of 3,400 µg/L was detected at 50WW13. The maximum perchlorate concentration of 43,000 µg/L was detected at 50WW12.

Year 1, Quarter 2. During the October 2020 sampling event (including the longer list of wells sampled for the annual LTM monitoring), VOCs were detected above MCLs at nine wells (50WW05, 50WW06, 50WW08, 50WW09, 50WW11, 50WW12, 50WW13, 50WW14, and 50WW15) and perchlorate was detected above the PCL at five wells (50WW06, 50WW08, 50WW11, 50WW12, and 50WW13). The maximum TCE concentration of 8,300 µg/L was detected at 50WW13. The maximum perchlorate concentration of 41,600 µg/L was detected at 50WW12.

Year 1, Quarter 3. During the January 2021 sampling event, VOCs were detected above the MCLs at six wells (50WW05, 50WW08, 50WW11, 50WW12, 50WW13 and 50WW14); perchlorate was detected above the PCL at five wells (50WW06, 50WW08, 50WW11,

50WW12, and 50WW13). The maximum TCE and perchlorate concentrations were both detected at 50WW12 at 690 µg/L and 83,800 µg/L, respectively.

Year 1, Quarter 4. During the April 2021 sampling event, VOCs were detected above the MCLs at six wells (50WW05, 50WW08, 50WW11, 50WW12, 50WW13, and 50WW14); perchlorate was detected above the PCL at four wells (50WW08, 50WW11, 50WW12 and 50WW13). The maximum TCE and perchlorate concentrations were both detected at monitoring well 50WW12 at 1,600 µg/L and 90,000 µg/L, respectively.

None of the COCs were detected above the MCLs/PCLs in intermediate well 50WW10 during any of the quarterly sampling events.

Laboratory analytical results are included in **Appendix D** and are discussed further in the context of remedial performance in **Section 3.0**. Historical groundwater analytical results are presented in **Table 2-5**.

2.2.3 Groundwater Monitoring Optimization

No change to the groundwater monitoring network is proposed for the Year 8 RA-O event. Samples will be collected during the Year 8 RA-O as shown in **Tables 2-1** and **2-2**.

2.3 Surface Water Sampling

No samples were collected from surface water location 50SW06 during Year 7 RA-O. The purpose of sampling at this location is to evaluate the potential groundwater to surface water pathway. Per the RAWP (AECOM 2013), samples are to be collected during the groundwater sampling events if there was water in the creek and the groundwater elevation at the nearest well, 50WW16, is above the bottom of the creek elevation. The groundwater elevation in 50WW16 was 179.03 feet above mean sea level (amsl) in Quarter 1, 178.16 feet amsl in Quarter 2, 178.37 feet amsl in Quarter 3, and 179.71 feet amsl in Quarter 4. The bottom of the creek elevation is 182.90 feet amsl; thus, the groundwater elevations during all four quarters were below the bottom of the creek and there was no contribution to surface water from groundwater. Therefore, no samples were collected at 50SW06 (**Table 2-6**). Evaluation of relative groundwater and surface water elevations and sampling of 50SW06, when groundwater elevations indicate that groundwater flow to the creek may be occurring, will continue in the Year 8 RA-O.

GPW-1 and GPW-1A were discontinued from surface water sampling because the perchlorate levels in the creek had been consistently below the PCL. The recommendation to discontinue sampling these locations was included in the Third Annual RA-O Report (Bhate 2018a) and approved by TCEQ and USEPA in July 2018.

2.4 Well Abandonment

Abandonment of monitoring wells 50WW03 and 50WW19 was approved based on the recommendations of the Second Annual RA-O Report and the Third Annual RA-O Report (AECOM 2016c, Bhate 2018a). However, these wells have not been abandoned and are being retained so that they are available for sampling, if needed. No wells are recommended for abandonment in this report.

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • March 2022

This page intentionally left blank.

3.0 REMEDY EVALUATION

This section presents the results of the ISB and natural attenuation evaluation in accordance with the three lines of evidence. Though the Draft Final contingency remedy RD/RAWP (USACE 2019b) included the evaluation of only two lines of evidence, the Year 6 RA-O Report included the recommendation to sample for DHC for the first four quarters of RA-O post-ISB; therefore, this discussion evaluates three lines of evidence for LHAAP-50 groundwater COCs. The discussion below pertains only to the shallow aquifer where COCs were detected above cleanup levels. The primary focus of this assessment is remedy evaluation in the active treatment areas. However, a full evaluation of the ISB remedy and associated statistical trends will not be possible until eight quarters of post-injection sampling data are available.

The RA-O monitoring network includes wells in the upper shallow zone, lower shallow zone, and upgradient/cross-gradient wells. The ISB treatment is not expected to result in immediate changes in concentrations in the upgradient/cross-gradient wells that lie outside the influence of the treatment area. The wells in the treatment area are 50WW06, 50WW11, 50WW12, 50WW13, and 50WW14.

3.1 First Line of Evidence: Plume Stability

The RD/RAWP describes the first line of evidence as plume stability (i.e., plume concentrations are declining in the performance wells, and the plume is not expanding in areal extent, as demonstrated by downgradient monitoring wells). The two parts of plume stability discussed below are: 1) change in COC Concentrations with time and distance; and 2) plume extent.

3.1.1 Change in COC Concentrations over Time and with Distance

Samples were collected from eight monitoring wells and analyzed for VOCs and perchlorate, as indicated in **Table 2-1**. The Draft Final RD/RAWP (USACE 2019b) identified these wells to monitor performance of the ISB contingency remedy at LHAAP-50. Additionally, 14 wells were sampled in October 2020 as part of the ongoing annual RA-O/LTM network (**Table 2-2**). Perchlorate, PCE, TCE, 1,2-DCA, 1,1-DCE, VC, and cis-1,2-DCE were detected above their respective PCL and MCLs.

Mann-Kendall statistical trend analysis was completed for nine impacted monitoring wells with COC concentrations above the cleanup levels (50WW05, 50WW06, 50WW08, 50WW09, 50WW11, 50WW12, 50WW13, 50WW14, and 50WW15). The data set used for the analysis included the 2013 baseline samples and all subsequent RA-O monitoring events. It should be noted that the trends for wells within the treatment area include data from prior to

the ISB injections because there is insufficient data for statistical analysis using only post- ISB data. Following the completion of the second year of quarterly sampling, trends using only post-injection data will be calculated with sufficient statistical significance. The trend analysis results are presented in **Appendix E** in graphical format with statistical results presented below the Mann-Kendall analysis. The dates are presented on the x-axis of each graph in **Appendix E**, and the concentrations of COCs are presented on the y-axis in µg/L.

The Mann-Kendall Test is a nonparametric statistical test to assess trends and is especially suited for evaluation of concentration-time series data to establish if trends are present (Gilbert 1987). This is a general test to determine whether concentrations tend to increase or decrease with time. The GSI Mann-Kendall Toolkit was used to conduct the analysis. Half of the detection limit was used for nondetect results, where applicable. Field duplicate data were not used, only the original sample. The Mann-Kendall Test was conducted for each of wells for each COC that contained a concentration above the MCL/PCL during the Year 7 RA-O. The Mann-Kendall trends for all COCs detected during the Year 7 RA-O were "stable," "no trend," or "significantly decreasing," except for perchlorate and TCE in 50WW12 and cis-1,2-DCE in 50WW05, which had "significantly increasing" trends. A summary of the Mann-Kendall results is presented in **Table 3-1**. The COC concentrations over time for selected wells at LHAAP-50 are shown on **Figures 3-1a** through **3-1i**.

Monitoring Well 50WW05

TCE and cis-1,2-DCE were detected above the cleanup levels in 50WW05 during all four quarters. The TCE concentrations had decreased from the baseline level of 280 µg/L in 2013 to 110 µg/L in May 2019; however, the concentration increased to 290 µg/L in November 2019 and further increased post ISB to 370 µg/L in October 2020 followed by a slight decrease in concentration to 240 µg/L in April 2021. The concentrations of cis-1,2-DCE had remained below the cleanup level of 70 µg/L since baseline in 2013; however, the concentration increased from 28 µg/L in May 2019 to 200 µg/L in November 2019 and showed a steady increase in concentration to 280 µg/L in October 2020, followed by a slight decrease in concentration to 140 µg/L in April 2021. The presence of the TCE daughter product cis-1,2-DCE indicates that limited reductive dechlorination is taking place.

The Mann-Kendall trend analysis for 50WW05 was conducted for TCE and cis-1,2-DCE. The Mann-Kendall results indicate a stable trend for TCE at a 66.1 percent confidence factor. The results for cis-1,2-DCE indicate a statistically significant increasing trend, at a 99.9 percent confidence factor. The COC concentration trends are shown on **Figure 3-1a**. There does not seem to be a definite correlation between COC concentrations and fluctuations in groundwater elevations.

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • March 2022

Monitoring Well 50WW06

Perchlorate and TCE were the only COCs detected above cleanup levels in 50WW06 in the baseline event in November 2019 and in October 2020. Since November 2016, both perchlorate and TCE concentrations had decreased significantly compared to 2013 concentrations until the November 2019 sampling event, when concentrations of both COCs increased back to levels similar to the November 2016 concentrations. Post-ISB, TCE, and perchlorate decreased to below cleanup levels in July 2020 and increased to above cleanup levels in October 2020 followed by a reduction in concentrations to below cleanup levels in January 2021 and April 2021.

The Mann-Kendall trend analysis for 50WW06 was conducted for perchlorate and TCE. The results indicate a decreasing trend for both TCE and perchlorate with confidence factors of 96.6 and 99.1 percent. TCE and perchlorate concentration trends are shown on **Figure 3-1b**. There is a distinct inverse correlation between groundwater elevations and TCE concentrations from 2013 to late 2016. The correlation is less consistent through 2017 and 2018, and more significant from 2019 and post-ISB.

Monitoring Well 50WW08

Perchlorate and TCE were the only COCs detected above the cleanup levels in 50WW08 during all four quarters. TCE and perchlorate concentrations increased post-ISB compared to baseline concentrations in November 2019. TCE and perchlorate increased from 420 and 83 µg/L, respectively, in November 2019 to 610 and 115 µg/L, respectively, in April 2021.

The Mann-Kendall trend analysis for 50WW08 was conducted for TCE and perchlorate. Despite the recent increases, the results indicate an overall stable trend for TCE at a 75 percent confidence factor while there was no statistically significant trend observed for perchlorate. Although there is not a statistically significant decreasing trend in perchlorate concentrations, the concentrations have decreased from 6,404 µg/L in the 2013 baseline to 115 µg/L in April 2021. Though the TCE trend is statistically stable, TCE concentrations show wide fluctuations with an increase in concentration from 247 µg/L in 2013 to 610 µg/L in April 2021. TCE and perchlorate concentration trends are shown on **Figure 3-1c**. Since early 2014 to November 2019, generally, the increase and decrease of perchlorate concentrations seem to be correlated with changes in groundwater elevations; however, post-ISB, the fluctuation in perchlorate concentrations and groundwater elevations are inversely related, as shown on **Figure 3-1c**.

Monitoring Well 50WW09

TCE was the only COC detected above the MCL at 50WW09 in October 2020. This well is only part of the LTM network and was not sampled during the other quarters. TCE concentrations have decreased from the highest level observed in August 2015 (235 µg/L) to

21 µg/L in October 2020, including some lower fluctuations as shown on **Figure 3-1d**. The Year 7 TCE concentration of 21 µg/L declined from 30 µg/L in November 2019.

The Mann-Kendall trend analysis conducted for TCE indicates that the concentrations are stable. Generally, the increase and decrease in TCE concentrations seems to be moderately correlated to the increase and decrease in groundwater elevations as shown on **Figure 3-1d**, except for the Year 5 through Year 7 RA-O sampling events, which show an inverse correlation.

Monitoring Well 50WW11

Perchlorate, TCE, 1,1-DCE, and 1,2-DCA were detected above their respective cleanup levels at 50WW11 during all four quarters. PCE and cis-1,2-DCE were detected above the MCLs only in the October 2020 sampling event and decreased to below MCLs in January and April 2021. Perchlorate concentrations decreased from 20,000 µg/L in November 2017 to 450 µg/L in May 2019, then increased to 8,000 µg/L in November 2019. Post-ISB, perchlorate concentrations have decreased to 421 µg/L in April 2021. Similar to perchlorate, TCE concentrations have fluctuated with a decrease from 4,700 µg/L in November 2017, to 95 µg/L in May 2019, and then an increase to 3,000 µg/L in November 2019. Post-ISB, concentrations of TCE reached a high at 3,300 µg/L in October 2020 and have since decreased to 250 µg/L in January 2021 and 200 µg/L in April 2021. 1,2-DCA and 1,1-DCE were detected at levels above the MCL in Quarters 1 and 2 and decreased to below the MCLs in Quarters 3 and 4. The concentrations of each of the COCs present have an inverse relationship with groundwater elevations as shown on **Figure 3-1e**. The reduction in COC concentrations and the increase in concentration of daughter products may indicate that reductive dechlorination is occurring.

The Mann-Kendall trend analysis for 50WW11 was conducted for perchlorate, TCE, cis-1,2-DCE, 1,1-DCE, and 1,2-DCA. The results indicate no statistically significant trend in concentrations for cis-1,2-DCE, and 1,1-DCE while a stable trend was identified for TCE and 1,2-DCA. Perchlorate concentrations showed a decreasing trend with a confidence factor of 97.5 percent. The contaminant concentration trends are shown on **Figure 3-1e**.

Monitoring Well 50WW12

Perchlorate and TCE were detected above their cleanup levels at 50WW12 during all four quarters. 1,1-DCE was detected above the MCL in July 2020 and April 2021, and 1,2-DCA was detected above the MCL in January and April 2021. The concentrations of perchlorate increased from 47,000 µg/L in November 2019 to 90,000 µg/L in April 2021, while TCE concentrations also increased from 280 µg/L in November 2019 to 1,600 µg/L in April 2021. The TCE concentration of 1,600 µg/L in April 2021 was the highest concentrations observed at 50WW12 since 2013, while the perchlorate concentration of 90,000 µg/L was the highest detection since May of 2018.

The Mann-Kendall trend analysis for 50WW12 was conducted for perchlorate and TCE. The results indicate a statistically significant increasing trend for TCE and perchlorate concentrations at a >99.9 and 99.1 percent confidence factor, respectively. TCE and perchlorate concentration trends are shown on **Figure 3-1f**. The increase and decrease in concentrations appear to be directly correlated to the change in groundwater elevations. The relatively high perchlorate concentrations, with seasonal peaks during times with elevated groundwater levels may suggest that residual source mass is present near this well. The increase in TCE over time suggests that the core of TCE plume may be migrating towards 50WW12, although the concentrations at downgradient well 50WW29 remain non-detect, indicating that the plume has not expanded downgradient.

Monitoring Well 50WW13

PCE, perchlorate, TCE, cis-1,2-DCE, 1,1-DCE, and 1,2-DCA were detected above their cleanup levels at 50WW13 during the Year 7 RA-O sampling. 1,1-DCE, 1,2-DCE, and cis-1,2-DCE concentrations were detected above the MCLs in Quarters 1 and 2 and decreased to below the MCLs in Quarters 3 and 4. PCE was only detected above the MCL in October 2020 at 8.6 µg/L and decreased to below the MCL in Quarters 3 and 4.

Post-ISB perchlorate concentrations showed fluctuations with the highest concentration in October 2020 at 4,390 µg/L but overall concentrations decreased from 4,900 µg/L in November 2019 to 155 µg/L in January 2021 and decreased further to 122 µg/L in April 2021. TCE concentrations reached a post-ISB high of 8,300 µg/L in October 2020 but decreased overall from 7,300 µg/L in November 2019 to 690 µg/L in January 2021 and further decreased to 410 µg/L in April 2021. Similar fluctuations have been observed with cis-1,2-DCE, 1,1-DCE, and 1,2-DCA, as shown on **Figure 3-1g**.

The Mann-Kendall trend analysis for 50WW13 was conducted for perchlorate, TCE, cis-1,2-DCE, 1,1-DCE, and 1,2-DCA. The results indicate no statistically significant trend in concentrations for perchlorate and 1,1-DCE and a stable trend for TCE, cis-1,2-DCE, and 1,2-DCA. The increases and decreases in concentrations appear to be inversely correlated to the groundwater elevations as shown on **Figure 3-1g**.

Monitoring Well 50WW14

TCE was the only COC detected in 50WW14 above the cleanup levels during the Year 7 RA-O. TCE levels have fluctuated in the last few years of sampling. TCE concentrations increased slightly from 37 µg/L in November 2019 to 74 µg/L in October 2020 and decreased to 23 µg/L in April 2021. Even though there was an increase in TCE in October 2020, the concentrations have decreased overall from the 93.8 µg/L measured in the 2013 baseline.

The Mann-Kendall trend analysis for 50WW14 was conducted for TCE. The results indicate no statistically significant trend in TCE concentrations. The TCE concentration trend is shown on **Figure 3-1h**. The fluctuating concentrations appear to generally be directly correlated to groundwater elevation changes, between 2016 and 2019, except for Year 7 RA-O.

Monitoring Well 50WW15

TCE was the only COC detected above the cleanup level in 50WW15 in November 2019. TCE levels have continued to fluctuate with an overall decline since early 2015 but increased slightly from 2.3 µg/L in May 2019 to 7.2 µg/L in November 2019, and further increased to 8.4 µg/L in October 2020.

The Mann-Kendall trend analysis in 50WW15 was conducted for TCE, evaluating data from 2013 to October 2020. The results indicate a statistically significant decreasing trend with a 99.9 percent confidence level. The TCE concentration trend is shown on **Figure 3-1i**. There appears to be an inverse correlation between contaminant concentrations and groundwater elevations except for Year 7 RA-O, when TCE increased slightly in October 2020 with an increase in groundwater elevation.

3.1.2 Plume Extent

A COC plume map for the shallow zone for Quarters 2 and 4 are presented on **Figures 2-10** and **2-11**. Plume maps were not created for Quarters 1 and 3. The Quarter 2 sampling event included a longer list of wells (14 wells) sampled as part of the RA-O/LTM network; therefore, a plume map was created for the Quarter 2 event. The Quarter 4 sampling event conducted in April 2021 was the last RA-O event for Year 1 RA-O; therefore, a plume map was created for the Quarter 4 sampling event representing the current state of the plume for the purposes of this reporting period. Plume maps were not created for Quarters 1 and 3, where the smaller set of locations was sampled, for the sake of redundancy. TCE and perchlorate are the most widespread COCs in the shallow groundwater. cis-1,2-DCE, 1,1-DCE, and 1,2-DCA plumes are contained within the TCE plume footprint. PCE increased to above MCLs only during Quarter 2 at two wells (50WW11 and 50WW13) and decreased to below MCL and remained below MCL in Quarters 3 and 4. The shapes of both the TCE and perchlorate plumes are oblong, elongated along the northeasterly groundwater flowpath. The groundwater contaminants follow the pattern of groundwater flow to the northeast and east-northeast. The TCE and perchlorate plumes in October 2020 and April 2021 resemble the shape of the November 2019 plume.

The TCE and perchlorate plumes extend northeastward from the eastern edge of the LHAAP-50 site boundary, encompassing several monitoring wells (50WW05, 50WW06, 50WW08/50WW09, 50WW11, 50WW13/50WW14, and 50WW15) and ending just past well 50WW12. In lower shallow zone well 50WW06, perchlorate was above the PCL in

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • March 2022

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • March 2022

October 2020 and decreased to below the PCL in January 2021 and remained below the PCL in April 2021; perchlorate was below the PCL in lower shallow wells 50WW09 and 50WW14 during all the quarters sampling was conducted. In lower shallow well 50WW06, TCE was above the MCL in October 2020 and decreased to below the PCL in January 2021 and April 2021; TCE remained above the MCL in lower shallow wells 50WW09 and 50WW14. The COC data for the Year 7 RA-O monitoring period suggest that the plumes are showing overall stable conditions and are not expanding.

Even though the overall plume is relatively stable, the Mann-Kendall analysis indicates a significant increasing trend for TCE and perchlorate concentrations at the downgradient well 50WW12. TCE concentrations were found to be significantly decreasing at 50WW06 and 50WW15. At five wells (50WW05, 50WW08, 50WW09, 50WW11, and 50WW13), stable TCE trends were observed; the increase in concentration of daughter products indicates that reductive dechlorination is occurring. No trend was observed for TCE at well 50WW14. The highest TCE during the Year 7 RA-O was detected at 50WW13 in October 2020 at 8,300 µg/L, which then decreased to 410 µg/L in April 2021. At this time, the consistent lack of detectable concentrations at wells outside of the plume suggest that the overall TCE plume extent is relatively stable, although concentrations are increasing at 50WW12, suggesting that downgradient migration of the plume core may be occurring. The samples collected from downgradient well 50WW29 did not contain detectable TCE, indicating that the plume does not extend far beyond 50WW12.

The stability of the perchlorate plume was also evaluated using the wells outside of the plume and those inside the plume with concentrations above the PCL. At 50WW11 and 50WW06, located in the middle of the plume, perchlorate concentrations were found to be significantly decreasing. At downgradient well 50WW12, significantly increasing concentrations were observed over the course of the four quarterly sampling events, with the highest perchlorate concentration since May 2018 detected in April 2021 (90,000 µg/L). However, perchlorate was not detected in the sample collected from well 50WW29, downgradient of 50WW12, indicating that the plume does not extend far beyond 50WW12. At 50WW08 and 50WW13, located within the plume, no statistical trend was observed for perchlorate. At this time, the consistent lack of detectable concentrations at wells outside of the plume suggest that the perchlorate plume is relatively stable, although there may be some residual source feeding concentrations near downgradient well 50WW12.

Overall, during the Year 7 RA-O, both TCE and perchlorate plumes were stable and did not expand. COC concentrations at 50WW29 were not detected during all four quarters for Year 7 RA-O event, indicating the plumes are bound by 50WW29 and have not expanded very far beyond 50WW12. However, TCE and perchlorate at 50WW12 have shown a steady increase in concentrations compared to baseline concentrations in 2019. ISB injections conducted in

the vicinity of 50WW12 have not reduced concentrations as expected. The absence of daughter products like cis-1,2-DCE and VC indicate that reductive dichlorination may be limited in the vicinity of 50WW12. It should be noted that the concentrations of perchlorate, while elevated from baseline concentrations, are within the range of concentrations previously detected in 2018-2019. Quarterly RA-O monitoring will be continued for the second year to evaluate the effects of the ISB remedy on VOC and perchlorate concentrations in the treatment area and surrounding wells.

3.2 Second Line of Evidence: Geochemical Indicators

Table 2-1 identifies the wells that were chosen to evaluate the performance of the ISB remedy. Geochemical parameters are collected in the field and are recorded for all sampling events for all wells. The field measured parameters for LHAAP-50 wells include dissolved oxygen (DO), oxidation-reduction potential (ORP), pH, conductivity, turbidity, temperature, and ferrous iron. Groundwater samples were also analyzed for MNA parameters (nitrate, sulfate, chloride dissolved gases, and TOC).

The wells in the treatment area are 50WW06, 50WW11, 50WW12, 50WW13, and 50WW14.

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 generally cannot function at DO concentrations greater than approximately 0.5 milligram per liter (mg/L), and biotic reductive dechlorination is not expected to occur at DO levels above that threshold. DO levels in the fourth quarterly RA-O monitoring for wells within the treatment area are presented in **Table 2-2** and ranged between 0.17 and 1.39 mg/L. The DO levels in wells outside the treatment area ranged between 0.32 and 0.66. The third quarterly RA-O event showed significantly lower DO readings at the wells in the treatment area ranging between 0.03 to 0.09. DO readings in the wells outside the treatment area during Quarter 3 ranged between 0.02 and 0.08. Based on the DO readings, the DO levels decreased post-ISB, showing favorable conditions for reductive dechlorination in Quarter 3. However, the Quarter 4 RA-O event measurements indicate that DO levels are not conducive to reductive dechlorination.

Oxidation-Reduction Potential

The ORP levels indicate how oxidative or reductive the groundwater is in the aquifer matrix and provide real-time data regarding whether conditions may be conducive for anaerobic biodegradation. ORP values less than 50 millivolts (mV) are indicative that anaerobic conditions are present and are conducive for the biological reduction of perchlorate, chlorinated ethenes, and ethanes, though lower values (less than -150 mV) are considered to be ideal. During the fourth quarterly sampling event the in Year 7 RA-O, ORP was above

50 mV at all the wells in the treatment area except 50WW14, where the ORP was -34 mV. Outside the treatment area, the ORP values were above 50 mV at all wells. The ORP values in the impacted wells indicate that oxidative conditions are present in all wells except for 50WW14, which is not favorable for reductive dechlorination. However, the ORP levels during the Quarter 3 monitoring event in the Year 7 RA-O were negative in two locations (50WW13 and 50WW14) and positive, but below 50 mV in another (50WW29).

Nitrate

After DO has been depleted in the microbiological treatment zone, 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). Nitrate levels in LHAAP-50 groundwater were detected near or below the laboratory reporting limit of 0.1 µg/L during the seventh annual RA-O monitoring period (**Table 2-2**). Therefore, nitrate levels indicate that nitrate-reducing processes will not inhibit anerobic biodegradation of perchlorate or chlorinated ethenes.

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 2-2** indicates that the sulfate concentrations were above 20 mg/L in all the wells in the treatment area. Sulfate concentrations were above 20 mg/L at the four out of five wells in the treatment area and ranged between 304 and 572 mg/L, indicating that sulfate may compete as an electron acceptor with VOCs and perchlorate. Sulfate was detected at 10.9 mg/L at 50WW06. Sulfate was not analyzed for in wells outside the treatment area.

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 measured at the five wells in the treatment area ranged between 1.13 and 3.0 µg/L in the fourth quarterly monitoring event during the Year 7 RA-O. Methane concentrations do not indicate highly reducing conditions.

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). TOC concentrations were measured during this monitoring period in select wells and were found to be below 20 mg/L. The TOC levels detected are not sufficient to support the reduction of perchlorate or VOCs.

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). The groundwater pH within the treatment area ranged between 5.04 and 6.34 standard units in the fourth quarter monitoring event as part of the Year 7 RA-O; outside the treatment area, the pH ranged between 5.56 and 6.78. The pH levels in the treatment area were below 6 standard units at three of the five wells. The sub-optimal pH levels maybe marginal for microbial populations but will not necessarily prevent biological degradation from occurring.

Ethane and Ethene

Ethane and ethene, the two end products of the reductive dechlorination pathways for chlorinated ethanes and ethenes, continued to be below the laboratory reporting limits during the seventh annual RA-O monitoring period. These results indicate that complete degradation of chlorinated ethenes is not occurring.

Geochemical Indicator and MNA Parameter Summary

The qualitative assessment of geochemical indicators in the shallow groundwater zone at LHAAP-50 indicates that conditions may have been conducive to biological degradation early in the post ISB sampling, but the conditions in the most recent 4th quarterly sampling event were not conducive to the biological reduction of VOCs and perchlorate within the treatment area. Continued quarterly monitoring will determine whether the 4th quarter conditions are the result of seasonal recharge and fluctuating conditions. Nonetheless, the presence of degradation products cis-1,2-DCE and VC suggests that limited biological degradation is occurring; however, the primary MNA processes reducing concentrations may be abiotic.

3.3 Third Line of Evidence: Microbial Analysis and Predictive Modeling

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.

3.3.1 Microbial Analysis

Dechlorinating bacteria (Dehalococcoides ethenogenes [DHC] and associated functional genes) were analyzed and ranged between 0.4 J and 13.4 cell equivalent per milliliter in the

treatment area. DHC results indicate that a microbial culture potentially capable of reductive dechlorination exists in site groundwater, but the populations present were not sufficient to promote significant contaminant degradation.

3.3.2 Predictive Modeling

Calculation of first-order degradation rates will not be conducted until eight quarterly sampling events have been completed post-ISB. First order rate constants will be calculated using the Year 8 RA-O report.

This page intentionally left blank.

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • March 2022

4.0 SUMMARY AND CONCLUSIONS

4.1 Summary

A LUC compliance inspection was conducted in September 2020. No change in land or groundwater use has occurred at the site, and the use of the site is still consistent with that mandated by the ROD.

No damage to bollards, well pads, or protective casings was observed during the 2020/2021 well inspections, and minimal encroachment of weeds or brush on the wells pads was observed.

The VOCs, perchlorate, and geochemical data were collected for four quarters during the Year 7 RA-O monitoring period at LHAAP-50 to evaluate effectiveness of the ISB remedy. A tiered approach assessing the three lines of evidence was used to evaluate the occurrence of natural attenuation in site groundwater.

TCE and perchlorate are the most widespread COCs in shallow groundwater. No COCs were detected above the cleanup levels in intermediate groundwater. An assessment of the first line of evidence shows that both TCE and perchlorate plumes were relatively stable during the Year 7 RA-O monitoring. The plumes are bounded by downgradient well 50WW29, where the COCs were not detected.

In the upgradient portion of the plume, TCE concentrations at 50WW05 and 50WW08 are stable, and 50WW15 shows a significant decreasing trend. During the Year 7 of RA-O sampling, the highest concentration of TCE was observed at 50WW13 in October 2020 at 8,300 µg/L near the center of the plume and decreased to 410 µg/L in April 2021. In the downgradient portion of the plume at well 50WW12, the TCE concentrations show a significant increasing trend; TCE was observed at 280 µg/L in November 2019 and increased to 1,600 µg/L in April 2021.

Perchlorate, like TCE, also shows an increasing trend at 50WW12. During the Year 7 RA-O sampling event, the highest perchlorate concentration since May 2018 was detected at downgradient well 50WW12 at 90,000 µg/L in April 2021. Monitoring well 50WW29, installed to delineate the plume more tightly in the downgradient direction, did not contain detectable COC concentrations in April 2021. This indicates that the plume is delineated and has not expanded far beyond 50WW12.

A review of the data in individual wells over the course of the monitoring period shows both direct and inverse correlations between groundwater elevations and COC concentrations. The increasing TCE concentrations and the seasonal fluctuations at 50WW12 indicate the plume

core may be migrating towards 50WW12 and that a residual mass of perchlorate may be affected by seasonal groundwater elevation fluctuations.

The qualitative assessment of geochemical indicators in the shallow groundwater zone at LHAAP-50 indicates that conditions were initially somewhat conducive to the biological reduction of VOCs and perchlorate within the treatment area during the post ISB sampling, but the most recent conditions in the 4th quarterly sampling event were not conducive to biological degradation of COCs. The continued quarterly monitoring will reveal whether the more recent unfavorable conditions are the result of seasonal groundwater fluctuations or reflect a longer-term trend. Nonetheless, the presence of degradation products, cis-1,2-DCE, and VC suggest that limited biological degradation is occurring; however, the primary MNA processes reducing concentrations may be abiotic.

Surface water samples to evaluate the performance of soil removal action (soil to surface water pathway) were not collected during the Year 7 RA-O monitoring period based on the recommendations in the Third Annual RA-O Report, which was approved in July 2018 (Bhate 2018a). Sampling of 50SW06 to evaluate potential groundwater to surface water pathway was also not conducted during the Year 7 RA-O because the groundwater elevation was below the bottom of the creek and it was determined that there was no contribution from groundwater to surface water.

There is no change in the monitoring network for the Year 8 RA-O, and the sampling will be conducted as approved in the RD/RAWP for contingency remedy (USACE 2019b). The wells are in good condition and do not require additional maintenance during the Year 8 RA-O.

4.2 Conclusion

Based on the first year of RA-O data post ISB injections (Year 7 post-remedy), stable and decreasing trends for TCE and perchlorate have been observed in the treatment area except for monitoring well 50WW12. Geochemical parameters (DO, ORP and TOC) indicated that reducing conditions were present through the third quarterly sampling event in January 2021, but the conditions were not favorable for reductive dichlorination during the Year 7 fourth quarter RA-O. While COCs elsewhere within the treatment areas are decreasing, TCE and perchlorate concentrations have shown a steady increase at 50WW12. The increasing TCE concentrations and the seasonal fluctuations at 50WW12 indicate that the core of the plume may be migrating towards 50WW12 and that a residual mass of perchlorate may be affected by seasonal groundwater elevation fluctuations. Quarterly RA-O monitoring will be continued in the second year to evaluate the impact of the ISB remedy and seasonal groundwater fluctuations on VOC and perchlorate concentrations

Based on the first year of RA-O data, the ISB remedy is not meeting the performance criteria at 50WW12 as outlined in the RD/RAWP (USACE 2019b). Additional investigation may be needed in the vicinity of 50WW12 to understand the source of increasing TCE and perchlorate concentrations.

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • March 2022

This page intentionally left blank.

5.0 REFERENCES

AECOM Technical Services, Inc. [AECOM]. 2013. *Draft Final Third Annual Remedial Action Operation Report, LLHAAP-50, Former Sump Water Tank, Longhorn Army Ammunition Plant, Karnack, Texas*. July 2018.

AECOM. 2016a. *Final Remedial Action Completion Report, LHAAP-50, Former Sump Water Tank, Longhorn Army Ammunition Plant, Karnack, Texas*. June.

AECOM. 2016b. *Draft Final 1st Annual Remedial Action Operation Report, LHAAP-50, Former Sump Water Tank, Longhorn Army Ammunition Plant, Karnack, Texas*. November.

AECOM. 2016c. *Final 2nd Annual Remedial Action Operation Report, LHAAP-50, Former Sump Water Tank, Longhorn Army Ammunition Plant, Karnack, Texas*. December.

Bhate Environmental Associates, Inc. (Bhate). 2018a. *Draft Final Third Annual Remedial Action Operation Report, LHAAP-50 Former Sump Water Tank, Longhorn Army Ammunition Plant, Karnack, Texas.* July.

Bhate. 2018b. *Final Installation-Wide Work Plan, Longhorn Army Ammunition Plant, Karnack, Texas*. May.

Bhate. 2019a. *Final Remedial Design and Remedial Action Work Plan, Contingency Remedy, LHAAP-50, Longhorn Army Ammunition Plant, Karnack, Texas*. April.

Bhate. 2019b. *Final Technical Memorandum – Monitored Natural Attenuation Parameters.* Longhorn Army Ammunition Plant, Karnack, Texas. February.

Bhate. 2020. Draft Final Remedial Action Completion Report, Contingency Remedy, LHAAP-50 Former Sump Water Tank. Longhorn Army Ammunition Plant, Karnack, Texas. November.

Gilbert, R. O. 1987. *Statistical Methods for Environmental Pollution Monitoring. Van Nostrand Reinhold, New York, NY. ISBN 0-442-23050-8.*

Jacobs Engineering Group, Inc. 2002. *Final Remedial Investigation Report for the Group 4 Sites, Sites 35A, 35B, 35C, 46, 47, 48, 50, and 60, and Goose Prairie Creek, Longhorn Army Ammunition Plant, Karnack, Texas*. January.

U.S. Army Corps of Engineers (USACE). 2010. *Record of Decision, LHAAP-50, Former Sump Water Tank, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas*. September.

USACE. 2019a. *Final Explanation of Significant Differences, Record of Decision for Contingency Remedy at LHAAP-50, Former Sump Water Tank, Longhorn Army Ammunition Plant, Karnack, Texas*. July.

USACE. 2019b. *Draft Final Remedial Design/Remedial Action Work Plan, Contingency Remedy LHAAP-50 Former Sump Water Tank, Longhorn Army Ammunition Plant*. December.

U.S. Environmental Protection Agency (USEPA). 1998. *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*. EPA/600/R-98/128. September.

Tables

Table 2-1
ISB Performance Monitoring Network Locations and Analyses

Monitoring Location	Primary Rationale for Well Selection	Proposed Analyses: Performance – Years 1 and 2 (Quarterly)								
		Perchlorate (314.0)	VOCs	DO (field reading)	ORP (field reading)	pH (field reading)	Ferrous Iron (field reading)	Anions (E300.0)	Diss Gases (ethene, ethane, methane & carbon dioxide)	TOC (SW9060)
50WW08	Upgradient well	✓	✓	✓	✓	✓				
50WW05	Cross-gradient well	✓	✓	✓	✓	✓				
50WW06	Performance data within the plume	✓	✓	✓	✓	✓	✓	✓	✓	✓
50WW11	Performance data within the treatment zone	✓	✓	✓	✓	✓	✓	✓	✓	✓
50WW12	Performance data within the treatment zone	✓	✓	✓	✓	✓	✓	✓	✓	✓
50WW13	Performance data within the treatment zone	✓	✓	✓	✓	✓	✓	✓	✓	✓
50WW14	Performance data within the treatment zone	✓	✓	✓	✓	✓	✓	✓	✓	✓
50WW29	Downgradient well	✓	✓	✓	✓	✓				

Notes:

Anions include chloride, nitrate, and sulfate.

✓ Indicates that sample will be collected and analyzed for the listed analyte.

DO - dissolved oxygen

ISB - in situ bioremediation

ORP - oxygen-reduction potential

TOC - total organic carbon

VOC - volatile organic compound

Table 2-2
RA-O/Long-Term Monitoring Network, LHAAP-50

Well ID	VOCs	Perchlorate	Field Parameters	TOC	Anions (chloride, nitrate, sulfate)	Dissolved Gases (ethene, ethane, methane)	Carbon dioxide	Ferrous Iron (only field)
Groundwater Sample Locations								
50WW05	X	X	X					
50WW06	X	X	X	X	X	X	X	X
50WW08	X	X	X					
50WW09	X	X	X					
50WW11	X	X	X	X	X	X	X	X
50WW12	X	X	X	X	X	X	X	X
50WW13	X	X	X	X	X	X	X	X
50WW14	X	X	X	X	X	X	X	X
50WW15	X	X	X					
50WW16	X	X	X					
50WW18	X	X	X					
50WW22	X	X	X					
50WW23	X	X	X					
50WW29	X	X	X					

Notes:

The RA-O results from the Nov 2019 sampling event will be used for baseline sampling event.

Field Parameters: DO, ORP, pH, specific conductivity, temperature.

ID - identifier

DO - dissolved oxygen

ORP - oxidation-reduction potential

RA-O - remedial action operation

TOC - total organic carbon

VOC - volatile organic compound

Table 2-3
Groundwater Elevation Data, LHAAP-50

Monitoring Well	Aquifer	Date	Ground Surface Elevation (ft amsl)	Top of Casing Elevation (ft amsl)	Top of Screen (ft BTOC)	Bottom of Screen (ft BTOC)	Constructed Well Depth (ft bgs)	Measured Well Depth (ft BTOC)	Depth to Water (ft BTOC)	Groundwater Elevation (ft amsl)	Screened Interval Siltation (%)
50WW01	Upper Shallow	7/9/2020	195.29	198.50	13.21	23.21	23.21	23.25	18.65	179.85	None
		10/6/2020	195.29	198.50	13.21	23.21	23.21	23.25	19.15	179.35	None
		1/28/2021	195.29	198.50	13.21	23.21	23.21	23.25	18.90	179.60	None
		4/5/2021	195.29	198.50	13.21	23.21	23.21	23.23	17.85	180.65	None
50WW02	Upper Shallow	7/8/2020	197.40	200.74	12.34	22.34	22.34	22.37	DRY	DRY	None
		10/6/2020	197.40	200.74	12.34	22.34	22.34	22.37	DRY	DRY	None
		1/28/2021	197.40	200.74	12.34	22.34	22.34	22.20	DRY	DRY	1.4
		4/5/2021	197.40	200.74	12.34	22.34	22.34	22.20	20.50	180.24	1.4
50WW03	Upper Shallow	7/8/2020	199.88	202.94	13.06	23.06	23.06	23.20	DRY	DRY	None
		10/6/2020	199.88	202.94	13.06	23.06	23.06	23.20	DRY	DRY	None
		1/28/2021	199.88	202.94	13.06	23.06	23.06	22.98	DRY	DRY	0.8
		4/5/2021	199.88	202.94	13.06	23.06	23.06	23.00	21.45	181.49	0.6
50WW04	Upper Shallow	7/8/2020	201.64	204.51	12.87	22.87	22.87	23.20	DRY	DRY	None
		10/6/2020	201.64	204.51	12.87	22.87	22.87	23.20	DRY	DRY	None
		1/28/2021	201.64	204.51	12.87	22.87	22.87	23.20	DRY	DRY	None
		4/5/2021	201.64	204.51	12.87	22.87	22.87	23.22	DRY	DRY	None
50WW05	Upper Shallow	7/8/2020	195.2	197.60	14.34	24.34	25.34	25.35	18.60	179.08	9.9
		10/1/2020	195.2	197.60	14.34	24.34	25.34	25.30	19.00	178.60	None
		1/25/2021	195.2	197.60	14.34	24.34	25.34	25.31	18.33	179.27	None
		4/5/2021	195.2	197.60	14.34	24.34	25.34	25.31	17.95	179.65	None
50WW06	Lower Shallow	7/9/2020	192.99	195.35	47.35	57.35	60.35	58.00	12.62	182.73	None
		10/1/2020	192.99	195.35	47.35	57.35	60.35	58.05	17.05	178.30	None
		1/28/2021	192.99	195.35	47.35	57.35	60.35	58.10	13.50	181.85	None
		4/6/2021	192.99	195.35	47.35	57.35	60.35	58.11	12.44	182.91	None
50WW07	Upper Shallow	7/9/2020	199.88	202.55	21.67	31.67	31.67	31.81	24.12	178.43	None
		10/6/2020	199.88	202.55	21.67	31.67	31.67	31.81	24.20	178.35	None
		1/28/2021	199.88	202.55	21.67	31.67	31.67	31.81	23.97	178.58	None
		4/5/2021	199.88	202.55	21.67	31.67	31.67	31.82	23.68	178.87	None
50WW08	Upper Shallow	7/8/2020	197.16	199.67	17.11	31.71	32.26	32.71	20.50	179.17	None
		10/5/2020	197.16	199.67	17.11	31.71	32.26	32.72	20.98	178.69	None
		1/25/2021	197.16	199.67	17.11	31.71	32.26	32.73	20.35	179.32	None
		4/5/2021	197.16	199.67	17.11	31.71	32.26	32.72	19.64	180.03	None

Table 2-3
Groundwater Elevation Data, LHAAP-50

Monitoring Well	Aquifer	Date	Ground Surface Elevation (ft amsl)	Top of Casing Elevation (ft amsl)	Top of Screen (ft BTOC)	Bottom of Screen (ft BTOC)	Constructed Well Depth (ft bgs)	Measured Well Depth (ft BTOC)	Depth to Water (ft BTOC)	Groundwater Elevation (ft amsl)	Screened Interval Siltation (%)
50WW09	Lower Shallow	7/8/2020	197.06	199.41	46.75	61.25	61.85	62.42	20.05	179.36	None
		10/5/2020	197.06	199.41	46.75	61.25	61.85	62.42	20.75	178.66	None
		1/28/2021	197.06	199.41	46.75	61.25	61.85	62.42	21.57	177.84	None
		4/5/2021	197.06	199.41	46.75	61.25	61.85	62.42	19.47	179.94	None
50WW10	Intermediate	7/8/2020	196.72	199.25	101.43	110.93	111.53	111.25	20.37	178.88	None
		10/6/2020	196.72	199.25	101.43	110.93	111.53	111.23	23.38	175.87	None
		1/28/2021	196.72	199.25	101.43	110.93	111.53	111.25	22.95	176.30	None
		4/5/2021	196.72	199.25	101.43	110.93	111.53	111.37	22.55	176.70	None
50WW11	Upper Shallow	7/9/2020	194.72	197.07	22.55	37.05	37.65	37.78	17.98	179.09	None
		10/1/2020	194.72	197.07	22.55	37.05	37.65	37.80	18.55	178.52	None
		1/28/2021	194.72	197.07	22.55	37.05	37.65	37.80	18.33	178.74	None
		4/6/2021	194.72	197.07	22.55	37.05	37.65	37.80	17.21	179.86	None
50WW12	Upper Shallow	7/9/2020	193.26	195.66	22.50	37.00	37.60	37.92	17.00	178.66	None
		10/1/2020	193.26	195.66	22.50	37.00	37.60	37.92	17.53	178.13	None
		1/28/2021	193.26	195.66	22.50	37.00	37.60	37.92	17.28	178.38	None
		4/6/2021	193.26	195.66	22.50	37.00	37.60	37.84	16.20	179.46	None
50WW13	Upper Shallow	7/9/2020	195.01	197.45	22.44	36.94	37.54	37.65	19.35	178.10	None
		10/1/2020	195.01	197.45	22.44	36.94	37.54	37.63	18.95	178.50	None
		1/28/2021	195.01	197.45	22.44	36.94	37.54	37.65	18.75	178.70	None
		4/6/2021	195.01	197.45	22.44	36.94	37.54	37.65	17.65	179.80	None
50WW14	Lower Shallow	7/9/2020	195.14	197.52	45.78	60.28	60.88	60.70	18.38	179.14	None
		10/1/2020	195.14	197.52	45.78	60.28	60.88	60.70	19.04	178.48	None
		1/28/2021	195.14	197.52	45.78	60.28	60.88	60.67	18.88	178.64	None
		4/6/2021	195.14	197.52	45.78	60.28	60.88	59.95	17.82	179.70	2.3
50WW15	Upper Shallow	7/8/2020	193.95	196.30	22.25	36.75	37.35	37.90	17.00	179.30	None
		10/5/2020	193.95	196.30	22.25	36.75	37.35	37.88	17.63	178.67	None
		1/28/2021	193.95	196.30	22.25	36.75	37.35	37.90	17.33	178.97	None
		4/5/2021	193.95	196.30	22.25	36.75	37.35	37.90	16.34	179.96	None
50WW16	Upper Shallow	7/9/2020	194.1	196.66	22.66	37.16	37.76	37.90	17.63	179.03	None
		10/5/2020	194.1	196.66	22.66	37.16	37.76	38.04	18.50	178.16	None
		1/28/2021	194.1	196.66	22.66	37.16	37.76	38.04	18.29	178.37	None
		4/5/2021	194.1	196.66	22.66	37.16	37.76	38.02	16.95	179.71	None

Table 2-3
Groundwater Elevation Data, LHAAP-50

Monitoring Well	Aquifer	Date	Ground Surface Elevation (ft amsl)	Top of Casing Elevation (ft amsl)	Top of Screen (ft BTOC)	Bottom of Screen (ft BTOC)	Constructed Well Depth (ft bgs)	Measured Well Depth (ft BTOC)	Depth to Water (ft BTOC)	Groundwater Elevation (ft amsl)	Screened Interval Siltation (%)
50WW17	Fully Penetrating Shallow	7/9/2020	192.73	195.13	22.30	66.80	67.40	64.63	17.07	178.06	4.9
		10/6/2020	192.73	195.13	22.30	66.80	67.40	64.63	17.48	177.65	4.9
		1/28/2021	192.73	195.13	22.30	66.80	67.40	64.63	17.17	177.96	4.9
		4/5/2021	192.73	195.13	22.30	66.80	67.40	64.55	16.50	178.63	5.1
50WW18	Upper Shallow	7/9/2020	192.57	194.84	22.37	36.87	37.47	37.65	16.88	177.96	None
		10/5/2020	192.57	194.84	22.37	36.87	37.47	37.65	17.21	177.63	None
		1/28/2021	192.57	194.84	22.37	36.87	37.47	37.65	16.95	177.89	None
		4/5/2021	192.57	194.84	22.37	36.87	37.47	37.44	17.21	177.63	None
50WW19	Fully Penetrating Shallow	7/9/2020	193.71	195.96	21.35	65.85	66.45	64.90	17.75	178.21	2.1
		10/6/2020	193.71	195.96	21.35	65.85	66.45	64.88	18.11	177.85	2.2
		1/28/2021	193.71	195.96	21.35	65.85	66.45	64.88	17.87	178.09	2.2
		4/5/2021	193.71	195.96	21.35	65.85	66.45	65.00	17.10	178.86	1.9
50WW20	Fully Penetrating Shallow	7/8/2020	200.3	202.54	20.54	55.04	55.54	57.80	23.42	179.12	None
		10/6/2020	200.3	202.54	20.54	55.04	55.54	57.80	23.83	178.71	None
		1/28/2021	200.3	202.54	20.54	55.04	55.54	55.83	23.80	178.74	None
		4/5/2021	200.3	202.54	20.54	55.04	55.54	55.84	23.00	179.54	None
50WW21	Upper Shallow	7/8/2020	197.68	200.14	22.36	36.86	37.46	37.67	21.17	178.97	None
		10/6/2020	197.68	200.14	22.36	36.86	37.46	37.67	21.60	178.54	None
		1/28/2021	197.68	200.14	22.36	36.86	37.46	37.63	21.70	178.44	None
		4/5/2021	197.68	200.14	22.36	36.86	37.46	37.65	20.51	179.63	None
50WW22	Upper Shallow	7/8/2020	199.93	202.10	21.97	36.57	37.17	37.82	23.03	179.07	None
		10/5/2020	199.93	202.10	21.97	36.57	37.17	37.82	23.42	178.68	None
		1/28/2021	199.93	202.10	21.97	36.57	37.17	37.80	23.22	178.88	None
		4/5/2021	199.93	202.10	21.97	36.57	37.17	37.80	22.25	179.85	None
50WW23	Upper Shallow	7/8/2020	198.33	200.75	22.42	36.92	37.52	37.82	22.00	178.75	None
		10/5/2020	198.33	200.75	22.42	36.92	37.52	37.82	22.30	178.45	None
		1/28/2021	198.33	200.75	22.42	36.92	37.52	37.82	22.24	178.51	None
		4/5/2021	198.33	200.75	22.42	36.92	37.52	37.84	21.45	179.30	None
50WW24	Upper Shallow	7/8/2020	199.37	201.63	22.66	37.16	37.76	38.02	22.92	178.71	None
		10/6/2020	199.37	201.63	22.66	37.16	37.76	38.00	23.05	178.58	None
		1/28/2021	199.37	201.63	22.66	37.16	37.76	37.96	23.07	178.56	None
		4/5/2021	199.37	201.63	22.66	37.16	37.76	38.02	22.48	179.15	None

Table 2-3
Groundwater Elevation Data, LHAAP-50

Monitoring Well	Aquifer	Date	Ground Surface Elevation (ft amsl)	Top of Casing Elevation (ft amsl)	Top of Screen (ft BTOC)	Bottom of Screen (ft BTOC)	Constructed Well Depth (ft bgs)	Measured Well Depth (ft BTOC)	Depth to Water (ft BTOC)	Groundwater Elevation (ft amsl)	Screened Interval Siltation (%)
50WW25	Lower Shallow	7/9/2020	193.48	195.98	47.50	56.90	57.50	57.81	16.91	179.07	None
		10/6/2020	193.48	195.98	47.50	56.90	57.50	57.80	17.67	178.31	None
		1/28/2021	193.48	195.98	47.50	56.90	57.50	57.80	17.39	178.59	None
		4/5/2021	193.48	195.98	47.50	56.90	57.50	57.82	16.13	179.85	None
50WW26	Lower Shallow	7/8/2020	197.68	200.07	47.49	61.99	62.59	62.80	21.25	178.82	None
		10/6/2020	197.68	200.07	47.49	61.99	62.59	62.80	21.31	178.76	None
		1/28/2021	197.68	200.07	47.49	61.99	62.59	62.77	22.57	177.50	None
		4/5/2021	197.68	200.07	47.49	61.99	62.59	62.85	20.55	179.52	None
50WW27	Lower Shallow	7/8/2020	193.84	196.22	45.28	59.78	60.38	59.95	16.91	179.31	None
		10/6/2020	193.84	196.22	45.28	59.78	60.38	59.93	17.57	178.65	None
		1/28/2021	193.84	196.22	45.28	59.78	60.38	59.94	17.05	179.17	None
		4/5/2021	193.84	196.22	45.28	59.78	60.38	59.93	16.35	179.87	None
50WW28	Upper Shallow	7/28/2020	192.04	194.71	16.57	26.57	26.97	27.10	16.03	178.68	None
		10/6/2020	192.04	194.71	16.57	26.57	26.97	27.10	16.72	177.99	None
		1/28/2021	192.04	194.71	16.57	26.57	26.97	27.10	16.49	178.22	None
		4/5/2021	192.04	194.71	16.57	26.57	26.97	27.10	15.31	179.40	None
50WW29	Upper Shallow	7/8/2020	192.18	195.63	23.45	38.45	38.45	37.90	17.69	177.94	3.7
		10/1/2020	192.18	195.63	23.45	38.45	38.45	38.10	18.03	177.60	2.3
		1/25/2021	192.18	195.63	23.45	38.45	38.45	38.10	17.18	178.45	2.3
		4/5/2021	192.18	195.63	23.45	38.45	38.45	37.90	16.93	178.70	3.7

Notes:

% - percent

ft amsl - feet above mean sea level

ft bgs - feet below ground surface

ft BTOC - feet below top of casing

LHAAP - Longhorn Army Ammunition Plant.

Table 2-4
Year 1 RA-O Analytical Results, LHAAP-50

			Location Code	50WW05 (Upper Shallow)										50WW08 (Upper Shallow)										50WW11 (U					
			Sample ID	50WW05-191108		50WW05-200708		50WW05-201001		50WW05-210125		50WW05-210405		50WW08-191112		50WW08-200708		50WW08-201005		50WW08-210125		50WW08-210405		50WW11-191112		50WW11-200709-		50WW11-200709		50WW11-201001-	
			Sample Date	11/8/2019		7/8/2020		10/1/2020		1/25/2021		4/5/2021		11/12/2019		7/8/2020		10/5/2020		1/25/2021		4/5/2021		11/12/2019		7/9/2020		7/9/2020		10/1/2020	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		FD		REG		FD	
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	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																															
	Dehalococcoides	cells/mL	NV																									0.5			
Field Tests																															
	Dissolved oxygen	mg/L	NV	0.02		0.12		0.37		0.05		0.32		0.14		0.09		3.17		0.08		0.66		0.71				1.88			
	Ferrous Iron	mg/L	NV											0.09										0.64				0.51			
	Flow Rate	mL/Min	NV	100		100		100		100		100		100		100		100		100		100		100				100			
	Measured well depth	Ft BTOC	NV	25.31										32.74										37.8							
	Oxidation Reduction Potential	mV	NV	58		99		105		94		159		153		212		220		186		151		145				131			
	pH	pH_units	NV	6.75		7.07		6.71		7.02		6.78		6.99		7.23		6.02		6.12		6.57		6.39				6.69			
	Specific conductivity	mS/cm	NV	1.15		1.45		1.44		1.75		1.60		2.23		2.26		2.36		2.61		2.51		1.96				1.93			
	Temperature	deg. C	NV	16.78		21.76		20.30		19.52		17.50		16.17		21.38		18.27		19.13		16.96		14.64				21.79			
	Total Purge	Gal	NV	3.5		3.0		3		3		3.0		3		3		3		3		3		3.5				3.0			
	Turbidity	NTU	NV	0.7		0		0		0		0.2		72.7		0		0		17		18.3		116				43.6			
	Water Level at Reading Time	Ft BTOC	NV	20.73		18.79		19.19		18.53		18.18		22.61		20.72		21.22		20.56		19.89		20.2				18.22			
Gases																															
	Carbon dioxide	µg/L	NV											69,000										270,000		80,000		85,000		79,000	
	Ethane	µg/L	NV											< 0.47	U									< 0.47	U	< 0.47	U	< 0.47	U	< 0.47	U
	Ethylene	µg/L	NV											< 0.55	U									< 0.55	U	< 0.55	U	< 0.55	U	< 0.55	U
	Methane	µg/L	NV											3										6.8		0.93	J	< 1	U	5.1	
General Chemistry																															
	Chloride	mg/L	NV											361										294		300		306		301	
	Nitrate	mg/L	10											0.118										< 0.1	U	< 0.1	U	< 0.1	U	< 0.1	U
	Sulfate	mg/L	NV											304										351		388		391		403	
	Total organic carbon	mg/L	NV											0.83										1.49		1.16	J	1.18	J	1.86	
Perchlorate																															
	Perchlorate	µg/L	17	< 2	U	3.08		0.621		< 0.05	U	< 0.05	U	**83**		**89.8**		**172**		**126**		**115**		**8,000**		**4,960**		**4,880**		**7,940**	
Volatiles																															
	1,1,1,2-Tetrachloroethane	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
	1,1,1-Trichloroethane	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
	1,1,2,2-Tetrachloroethane	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
	1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	NV	< 0.5	U									1.6										< 5	U						
	1,1,2-Trichloroethane	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
	1,1-Dichloroethane	µg/L	NV	0.41	J									1										< 5	U						
	1,1-Dichloroethene	µg/L	7	4.8		4.9		7		4.4		4.7		1.2		0.95	J	1		0.82	J	1.3		**26**		**15**		**15**		**34**	
	1,1-Dichloropropene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
	1,2,3-Trichlorobenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
	1,2,3-Trichloropropane	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
	1,2,4-Trichlorobenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
	1,2,4-Trimethylbenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
	1,2-Dibromo-3-chloropropane	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
	1,2-Dibromoethane	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
	1,2-Dichlorobenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
	1,2-Dichloroethane	µg/L	5	2.7		2.4		3.1		2		1.6		2.2		1.5		2.2		2.3		1.8		**28**		**13**		**13**		**25**	
	1,2-Dichloropropane	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
	1,3,5-Trimethylbenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
	1,3-Dichlorobenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						

Table 2-4
Year 1 RA-O Analytical Results, LHAAP-50

	Location Code	50WW05 (Upper Shallow)										50WW08 (Upper Shallow)										50WW11 (U					
	Sample ID	50WW05-191108		50WW05-200708		50WW05-201001		50WW05-210125		50WW05-210405		50WW08-191112		50WW08-200708		50WW08-201005		50WW08-210125		50WW08-210405		50WW11-191112		50WW11-200709-		50WW11-200709		50WW11-201001-	
	Sample Date	11/8/2019		7/8/2020		10/1/2020		1/25/2021		4/5/2021		11/12/2019		7/8/2020		10/5/2020		1/25/2021		4/5/2021		11/12/2019		7/9/2020		7/9/2020		10/1/2020	
	Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		FD		REG		FD	
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	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3-Dichloropropane	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
1,4-Dichlorobenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
2,2-Dichloropropane	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
2-Butanone	µg/L	NV	< 1	U									< 1	U									< 10	U						
2-Chlorotoluene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
2-Hexanone	µg/L	NV	< 1	U									< 1	U									< 10	U						
4-Chlorotoluene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
Acetone	µg/L	NV	< 2	U									< 2	U									< 20	U						
Benzene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
Bromobenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
Bromochloromethane	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
Bromodichloromethane	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
Bromoform	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
Bromomethane	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
Carbon disulfide	µg/L	NV	< 1	U									< 1	U									< 10	U						
Carbon tetrachloride	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
Chlorobenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
Chloroethane	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
Chloroform	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
Chloromethane	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
cis-1,2-Dichloroethene	µg/L	70	**200**		**250**		**280**		**160**		**140**		39		41		57		55		58		58		29		29		**74**	
cis-1,3-Dichloropropene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
Dibromochloromethane	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
Dibromomethane	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
Dichlorodifluoromethane	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
Ethylbenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
Hexachlorobutadiene	µg/L	NV	< 1	U									< 1	U									< 10	U						
Isopropylbenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
m,p-Xylenes	µg/L	NV	< 1	U									< 1	U									< 10	U						
Methyl isobutyl ketone	µg/L	NV	< 1	U									< 1	U									< 10	U						
Methylene chloride	µg/L	NV	< 1	U									< 1	U									< 10	U						
Naphthalene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
n-Butylbenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
n-Propylbenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
o-Xylene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
p-Isopropyltoluene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
sec-Butylbenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
Styrene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
tert-Butylbenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
Tetrachloroethene	µg/L	5	1.2		< 1	U	0.75	J	0.86	J	< 1	U	1.3		1.4		1.4		1.4		1.6		< 5	U	2.7		2.4		**7.1**	
Toluene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
trans-1,2-Dichloroethene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
trans-1,3-Dichloropropene	µg/L	NV	< 0.5	U									< 0.5	U									< 5	U						
Trichloroethene	µg/L	5	**290**		**280**		**370**		**270**		**240**		**420**		**390**		**500**		**550**		**610**		**3,300**		**1,500**		**1,600**		**3,500**	
Trichlorofluoromethane	µg/L	NV	< 0.5	U									< 0.5	U									< 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	< 5	U	1.1		1.1		**3.5**	

Table 2-4
Year 1 RA-O Analytical Results, LHAAP-50

			Location Code	pper Shallow)								50WW12 (Upper Shallow)												50WW13 (Upper Shal					
			Sample ID	50WW11-201001		50WW11-210128		50WW11-210406-		50WW11-210406		50WW12-191112-		50WW12-191112		50WW12-200709		50WW12-201001		50WW12-210128		50WW12-210406		50WW13-191113		50WW13-200709		50WW13-201001	
			Sample Date	10/1/2020		1/28/2021		4/6/2021		4/6/2021		11/12/2019		11/12/2019		7/9/2020		10/1/2020		1/28/2021		4/6/2021		11/13/2019		7/9/2020		10/1/2020	
			Sample Purpose	REG		REG		FD		REG		FD		REG		REG		REG		REG		REG		REG		REG		REG	
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	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																													
	Dehalococcoides	cells/mL	NV	4		1.4				0.9						0.4	J	1.4		0.5	J	0.4	J			2		3.8	
Field Tests																													
	Dissolved oxygen	mg/L	NV	1.12		0.03				1.16				0.14		0.05		0.27		0.08		0.65		0.02		0.78		0.14	
	Ferrous Iron	mg/L	NV			1.91				0.74				0.61		0.31				0.97		0.58		0.7					
	Flow Rate	mL/Min	NV	100		100				100				100		100		100		100		100		100		100		100	
	Measured well depth	Ft BTOC	NV											37.9										37.64					
	Oxidation Reduction Potential	mV	NV	94		72				200				156		201		96		100		170		40		97		86	
	pH	pH_units	NV	6.70		5.60				5.70				6.22		6.20		6.46		5.71		6.11		6.77		6.88		6.06	
	Specific conductivity	mS/cm	NV	2.1		2.32				1.96				4.43		4.4		4.85		4.77		4.31		2.11		2.15		2.15	
	Temperature	deg. C	NV	19.05		15.42				18.11				15.07		21.31		19.65		15.56		18.66		12.95		20.8		18.84	
	Total Purge	Gal	NV	3.0		3				3.0				3.5		3		3		3.0		3.0		3.0		3		3.0	
	Turbidity	NTU	NV	20		73.3				60.3				142		17.2		32		43.3		73.1		118		23.1		11.8	
	Water Level at Reading Time	Ft BTOC	NV	18.77		18.54				17.43				19.16		17.22		17.73		17.45		16.4		20.35		19.58		19.21	
Gases																													
	Carbon dioxide	µg/L	NV	74,000		380,000	J	300,000	J	310,000	J	300,000		250,000		140,000		140,000		420,000		130,000	J	86,000		72,000		310,000	
	Ethane	µg/L	NV	< 0.47	U	< 0.47	U	< 0.47	U	< 0.47	U	< 0.47	U	< 0.47	U	< 0.47	U	< 0.47	U	< 0.47	UJ	< 0.47	U	< 0.47	U	< 0.47	U	< 0.47	U
	Ethylene	µg/L	NV	< 0.55	U	< 0.55	U	< 0.55	U	< 0.55	U	< 0.55	U	< 0.55	U	< 0.55	U	< 0.55	U	< 0.55	U	< 0.55	U	< 0.55	U	< 0.55	U	< 0.55	U
	Methane	µg/L	NV	4.6		4.4		1.7	J	1.1	J	1.6		1.5		0.68	J	0.83	J	0.61	J	1.5		4.7		0.65	J	4.2	
General Chemistry																													
	Chloride	mg/L	NV	305		295		283		295		1060		1070		1080		1080		1020		994		308		353		316	
	Nitrate	mg/L	10	< 0.1	U	< 0.1	U	< 0.1	U	< 0.1	U	< 0.1	U	< 0.1	U	< 0.1	U	< 0.2	U	0.11	J	0.226		< 0.1	U	< 0.1	U	< 0.1	U
	Sulfate	mg/L	NV	475		261		294		304		533		531		561		595		499		572		316		363		356	
	Total organic carbon	mg/L	NV	1.82		1.98		1.62		1.65		1.19		1.11		0.73	J	1.14		1.85		1.73		1.78		1.39	J	3.54	
Perchlorate																													
	Perchlorate	µg/L	17	**6,630**		**651**		**482**		**421**		**43,000**		**47,000**		**43,000**		**41,600**		**83,800**		**90,000**		**4,900**		**2,900**		**4,390**	
Volatiles																													
	1,1,1,2-Tetrachloroethane	µg/L	NV									< 0.5	U	< 0.5	U									< 12	U				
	1,1,1-Trichloroethane	µg/L	NV									< 0.5	U	< 0.5	U									< 12	U				
	1,1,2,2-Tetrachloroethane	µg/L	NV									< 0.5	U	< 0.5	U									< 12	U				
	1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	NV									< 0.5	U	< 0.5	U									< 12	U				
	1,1,2-Trichloroethane	µg/L	NV									< 0.5	U	< 0.5	U									< 12	U				
	1,1-Dichloroethane	µg/L	NV									1.5		< 0.5	U									< 12	U				
	1,1-Dichloroethene	µg/L	7	**35**		2.1	J	2		1.5		4.1		4.6		**7.3**		5.2		5.9	J	**17**		**17**	J	**7.4**		**17**	
	1,1-Dichloropropene	µg/L	NV									< 0.5	U	< 0.5	U									< 12	U				
	1,2,3-Trichlorobenzene	µg/L	NV									< 0.5	U	< 0.5	U									< 12	U				
	1,2,3-Trichloropropane	µg/L	NV									< 0.5	U	< 0.5	U									< 12	U				
	1,2,4-Trichlorobenzene	µg/L	NV									< 0.5	U	< 0.5	U									< 12	U				
	1,2,4-Trimethylbenzene	µg/L	NV									< 0.5	U	< 0.5	U									< 12	U				
	1,2-Dibromo-3-chloropropane	µg/L	NV									< 0.5	U	< 0.5	U									< 12	U				
	1,2-Dibromoethane	µg/L	NV									< 0.5	U	< 0.5	U									< 12	U				
	1,2-Dichlorobenzene	µg/L	NV									< 0.5	U	< 0.5	U									< 12	U				
	1,2-Dichloroethane	µg/L	5	**26**		2.4	J	1.8		1.5		2.7		2.7		4.4		3		**5.8**		**11**		**39**		**20**		**47**	
	1,2-Dichloropropane	µg/L	NV									< 0.5	U	< 0.5	U									< 12	U				
	1,3,5-Trimethylbenzene	µg/L	NV									< 0.5	U	< 0.5	U									< 12	U				
	1,3-Dichlorobenzene	µg/L	NV									< 0.5	U	< 0.5	U									< 12	U				

Table 2-4
Year 1 RA-O Analytical Results, LHAAP-50

		Location Code	pper Shallow)								50WW12 (Upper Shallow)												50WW13 (Upper Shal					
		Sample ID	50WW11-201001		50WW11-210128		50WW11-210406-		50WW11-210406		50WW12-191112-		50WW12-191112		50WW12-200709		50WW12-201001		50WW12-210128		50WW12-210406		50WW13-191113		50WW13-200709		50WW13-201001	
		Sample Date	10/1/2020		1/28/2021		4/6/2021		4/6/2021		11/12/2019		11/12/2019		7/9/2020		10/1/2020		1/28/2021		4/6/2021		11/13/2019		7/9/2020		10/1/2020	
		Sample Purpose	REG		REG		FD		REG		FD		REG		REG		REG		REG		REG		REG		REG		REG	
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	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3-Dichloropropane		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
1,4-Dichlorobenzene		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
2,2-Dichloropropane		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
2-Butanone		µg/L	NV								< 1	U	< 1	U									< 25	U				
2-Chlorotoluene		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
2-Hexanone		µg/L	NV								< 1	U	< 1	U									< 25	U				
4-Chlorotoluene		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
Acetone		µg/L	NV								< 2	U	< 2	U									< 25	U				
Benzene		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
Bromobenzene		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
Bromochloromethane		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
Bromodichloromethane		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
Bromoform		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
Bromomethane		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
Carbon disulfide		µg/L	NV								< 1	U	< 1	U									< 25	U				
Carbon tetrachloride		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
Chlorobenzene		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
Chloroethane		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
Chloroform		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
Chloromethane		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
cis-1,2-Dichloroethene		µg/L	70	**74**		6.7	J	5.7		5.3		0.76	J	< 0.5	U	1.1		0.87	J	1.3		4	J	**230**		**120**		**300**	
cis-1,3-Dichloropropene		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
Dibromochloromethane		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
Dibromomethane		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
Dichlorodifluoromethane		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
Ethylbenzene		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
Hexachlorobutadiene		µg/L	NV								< 1	U	< 1	U									< 12	U				
Isopropylbenzene		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
m,p-Xylenes		µg/L	NV								< 1	U	< 1	U									< 25	U				
Methyl isobutyl ketone		µg/L	NV								< 1	U	< 1	U									< 25	U				
Methylene chloride		µg/L	NV								< 1	U	< 1	U									< 25	U				
Naphthalene		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
n-Butylbenzene		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
n-Propylbenzene		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
o-Xylene		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
p-Isopropyltoluene		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
sec-Butylbenzene		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
Styrene		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
tert-Butylbenzene		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
Tetrachloroethene		µg/L	5	**6.8**		0.87	J	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 5	U	< 12	U	3.4	J	**8.6**	
Toluene		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
trans-1,2-Dichloroethene		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
trans-1,3-Dichloropropene		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
Trichloroethene		µg/L	5	**3,300**		**250**		**230**		**200**		**260**		**280**		**550**		**380**		**690**		**1,600**		**7,300**		**3,400**		**8,300**	
Trichlorofluoromethane		µg/L	NV								< 0.5	U	< 0.5	U									< 12	U				
Vinyl chloride		µg/L	2	**3.4**		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	UJ	< 2.5	U	< 12	U	< 2.5	U	**3.3**	J

Table 2-4
Year 1 RA-O Analytical Results, LHAAP-50

Location Code	low)		50WW15 (Upper Shallow)				50WW16 (Upper Shallow)				50WW18 (Upper Shallow)								50WW22 (Upper Shallow)				50WW23 (Upper Shallow)			
Sample ID	50WW13-210128		50WW13-210406		50WW15-191108		50WW15-201005		50WW16-191113		50WW16-201005		50WW18-191108		50WW18-201005		50WW18-201005-		50WW22-191112		50WW22-201005		50WW23-191113		50WW23-201005	
Sample Date	1/28/2021		4/6/2021		11/8/2019		10/5/2020		11/13/2019		10/5/2020		11/8/2019		10/5/2020		10/5/2020		11/12/2019		10/5/2020		11/13/2019		10/5/2020	
Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		FD		REG		REG		REG		REG	
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	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																												
Dehalococcoides	cells/mL	NV	5		1.7																							
Field Tests																												
Dissolved oxygen	mg/L	NV	0.06		0.85		0.04		0.83		0.07		0.26		0.05		0.15				1.83		0.95		0.71		1.1	
Ferrous Iron	mg/L	NV	1.43		0.65						0.15										0.17				0.38			
Flow Rate	mL/Min	NV	100		100		100		100		100		100		100		100				100		100		100		100	
Measured well depth	Ft BTOC	NV					37.83				38.03				37.55						37.82				37.82			
Oxidation Reduction Potential	mV	NV	-6		153		29		172		104		201		102		172				193		223		172		216	
pH	pH_units	NV	6.11		5.87		6.93		6.42		6.97		5.6		6.59		6.67				6.76		5.99		6.18		6.30	
Specific conductivity	mS/cm	NV	2.68		2.38		1.77		1.9		0.251		0.224		3.19		3.24				3.96		4.12		4.80		5.59	
Temperature	deg. C	NV	15.73		18.1		16.79		18.64		14.49		19.02		16.01		19.07				14.14		18.17		14.48		18.36	
Total Purge	Gal	NV	3.0		3.0		3.0		3.0		3		3		3		3.5				3		3.5		3.5		3	
Turbidity	NTU	NV	26.2		54.4		84.8		20		84.7		27.7		77		43.1				57.4		4.5		65.9		0	
Water Level at Reading Time	Ft BTOC	NV	18.99		17.87		19.22		17.83		19.9		18.74		18.93		17.42				25.1		23.68		23.7		22.52	
Gases																												
Carbon dioxide	µg/L	NV	260,000	J	300,000	J					26,000										79,000				190,000			
Ethane	µg/L	NV	< 0.47	U	< 0.47	U					< 0.47	U									< 0.47	U			< 0.47	U		
Ethylene	µg/L	NV	< 0.55	U	< 0.55	U					< 0.55	U									< 0.55	U			< 0.55	U		
Methane	µg/L	NV	4.3		1.4						3										0.55	J			< 1	U		
General Chemistry																												
Chloride	mg/L	NV	387		386						6.07										773				1290			
Nitrate	mg/L	10	< 0.1	U	< 0.1	U					< 0.1	U									< 0.1	U			0.104			
Sulfate	mg/L	NV	302		345						28.7										587				181			
Total organic carbon	mg/L	NV	1.64		1.76						1.05										1.01				0.2	J		
Perchlorate																												
Perchlorate	µg/L	17	**155**		**122**		< 2	U	< 0.5	U	1.6	J	0.0701	J	< 2	U	< 0.5	U	< 0.5	U	< 2	U	< 0.5	U	< 2	U	< 0.5	U
Volatiles																												
1,1,1,2-Tetrachloroethane	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
1,1,1-Trichloroethane	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
1,1,2,2-Tetrachloroethane	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					1				< 0.5	U		
1,1,2-Trichloroethane	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
1,1-Dichloroethane	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
1,1-Dichloroethene	µg/L	7	1		0.95	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	< 0.5	U	< 0.5	U
1,1-Dichloropropene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
1,2,3-Trichlorobenzene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
1,2,3-Trichloropropane	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
1,2,4-Trichlorobenzene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
1,2,4-Trimethylbenzene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
1,2-Dibromo-3-chloropropane	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
1,2-Dibromoethane	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
1,2-Dichlorobenzene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
1,2-Dichloroethane	µg/L	5	2.8		1.9		< 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	< 0.5	U
1,2-Dichloropropane	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
1,3,5-Trimethylbenzene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
1,3-Dichlorobenzene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		

Table 2-4
Year 1 RA-O Analytical Results, LHAAP-50

Location Code	low)		50WW15 (Upper Shallow)				50WW16 (Upper Shallow)				50WW18 (Upper Shallow)						50WW22 (Upper Shallow)				50WW23 (Upper Shallow)			
Sample ID	50WW13-210128		50WW13-210406		50WW15-191108		50WW15-201005		50WW16-191113		50WW16-201005		50WW18-191108		50WW18-201005		50WW18-201005-		50WW22-191112		50WW22-201005		50WW23-191113		50WW23-201005	
Sample Date	1/28/2021		4/6/2021		11/8/2019		10/5/2020		11/13/2019		10/5/2020		11/8/2019		10/5/2020		10/5/2020		11/12/2019		10/5/2020		11/13/2019		10/5/2020	
Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		FD		REG		REG		REG		REG	
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	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3-Dichloropropane	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
1,4-Dichlorobenzene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
2,2-Dichloropropane	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
2-Butanone	µg/L	NV					< 1	U			< 1	U			< 1	U					< 1	U			< 1	U		
2-Chlorotoluene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
2-Hexanone	µg/L	NV					< 1	U			< 1	U			< 1	U					< 1	U			< 1	U		
4-Chlorotoluene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
Acetone	µg/L	NV					< 2	U			< 1	U			< 2	U					< 2	U			< 1	U		
Benzene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
Bromobenzene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
Bromochloromethane	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
Bromodichloromethane	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
Bromoform	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
Bromomethane	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
Carbon disulfide	µg/L	NV					< 1	U			< 1	U			< 1	U					< 1	U			< 1	U		
Carbon tetrachloride	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
Chlorobenzene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
Chloroethane	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
Chloroform	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
Chloromethane	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
cis-1,2-Dichloroethene	µg/L	70	26		16		5.5		5.4		< 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-1,3-Dichloropropene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
Dibromochloromethane	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
Dibromomethane	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
Dichlorodifluoromethane	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
Ethylbenzene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
Hexachlorobutadiene	µg/L	NV					< 1	U			< 0.5	U			< 1	U					< 1	U			< 0.5	U		
Isopropylbenzene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
m,p-Xylenes	µg/L	NV					< 1	U			< 1	U			< 1	U					< 1	U			< 1	U		
Methyl isobutyl ketone	µg/L	NV					< 1	U			< 1	U			< 1	U					< 1	U			< 1	U		
Methylene chloride	µg/L	NV					< 1	U			< 1	U			< 1	U					< 1	U			< 1	U		
Naphthalene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
n-Butylbenzene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
n-Propylbenzene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
o-Xylene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
p-Isopropyltoluene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
sec-Butylbenzene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
Styrene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
tert-Butylbenzene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
Tetrachloroethene	µg/L	5	2.4		1.7		2.1		1.8		< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U
Toluene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
trans-1,2-Dichloroethene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
trans-1,3-Dichloropropene	µg/L	NV					< 0.5	U			< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U		
Trichloroethene	µg/L	5	**690**		**410**		**7.2**		**8.4**		1.5		0.62	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Trichlorofluoromethane	µg/L	NV					< 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	1.7		1.1		< 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 2-4
Year 1 RA-O Analytical Results, LHAAP-50

			Location Code	50WW29 (Upper Shallow)										50WW06 (Lower Shallow)										50WW09 (Lower Shallow)					
			Sample ID	50WW29-191111		50WW29-200708		50WW29-201001		50WW29-210125		50WW29-210405		50WW06-191112		50WW06-200709		50WW06-201001		50WW06-210128		50WW06-210406		50WW09-191111-		50WW09-191111		50WW09-201005	
			Sample Date	11/11/2019		7/8/2020		10/1/2020		1/25/2021		4/5/2021		11/12/2019		7/9/2020		10/1/2020		1/28/2021		4/6/2021		11/11/2019		11/11/2019		10/5/2020	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		FD		REG		REG	
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	Result	Val Qual	Result	Val Qual	Result	Val Qual
DHC																													
	Dehalococcoides	cells/mL	NV													< 1.2	U	0.2	J	0.6		0.4	J						
Field Tests																													
	Dissolved oxygen	mg/L	NV	0.05		0.03		0.06		0.02		0.56		0.04		2.42		0.06		0.09		1.39				0.25		0.43	
	Ferrous Iron	mg/L	NV											0.36		0.25				1.11		0.45							
	Flow Rate	mL/Min	NV	100		100		100		100		100		100		100		100		100		100				100		100	
	Measured well depth	Ft BTOC	NV	37.88										58.05												62.35			
	Oxidation Reduction Potential	mV	NV	70		68		142		7		245		158		257		95		107		263				116		219	
	pH	pH_units	NV	6.45		6.51		5.62		5.66		5.56		6.45		5.60		6.31		5.67		5.04				6.62		6.2	
	Specific conductivity	mS/cm	NV	3.44		3.65		3.83		4.13		4.16		0.505		0.086		0.385		0.130		0.076				1.68		2.08	
	Temperature	deg. C	NV	17.76		19.83		19.22		17.98		17.73		15.7		23.42		19.27		12.00		16.62				18.8		18.43	
	Total Purge	Gal	NV	3		3		3		3		3.5		2.5		3		3.0		3		3.0				3.0		3	
	Turbidity	NTU	NV	29.2		0		4.2		34.5		11.6		53.7		3.8		0		2.9		5.9				290		113	
	Water Level at Reading Time	Ft BTOC	NV	19.1		17.9		18.26		17.4		17.15		18.65		12.82		17.29		13.68		12.63				22.16		20.99	
Gases																													
	Carbon dioxide	µg/L	NV											120,000		98,000		93,000		45,000	J	88,000	J						
	Ethane	µg/L	NV											< 0.47	U	< 0.47	U	< 0.47	U	< 0.47	U	< 0.47	U						
	Ethylene	µg/L	NV											< 0.55	U	< 0.55	U	< 0.55	U	< 0.55	U	< 0.55	U						
	Methane	µg/L	NV											1.1	J	2.1		3.8		< 1	U	2.6							
General Chemistry																													
	Chloride	mg/L	NV											84.1		3.25		41.8		3.06		3.42							
	Nitrate	mg/L	10											< 0.1	U	< 0.1	U	< 0.1	U	0.212		< 0.1	U						
	Sulfate	mg/L	NV											20.8		8.12		17.9		8.29		10.9							
	Total organic carbon	mg/L	NV											1.63		9.31	J	6.09		1.55		1.57							
Perchlorate																													
	Perchlorate	µg/L	17	< 2	U	2.47		5.96		< 0.5	U	< 0.05	U	**4,300**		1.69		**1,660**		2.78		0.032	J	7.4		6.6		< 0.5	U
Volatiles																													
	1,1,1,2-Tetrachloroethane	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	1,1,1-Trichloroethane	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	1,1,2,2-Tetrachloroethane	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	1,1,2-Trichloroethane	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	1,1-Dichloroethane	µg/L	NV	< 0.5	U									< 0.5	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	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
	1,1-Dichloropropene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	1,2,3-Trichlorobenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	1,2,3-Trichloropropane	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	1,2,4-Trichlorobenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	1,2,4-Trimethylbenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	1,2-Dibromo-3-chloropropane	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	1,2-Dibromoethane	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	1,2-Dichlorobenzene	µg/L	NV	< 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	< 0.5	U	< 0.5	U	< 0.5	U
	1,2-Dichloropropane	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	1,3,5-Trimethylbenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	1,3-Dichlorobenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		

Table 2-4
Year 1 RA-O Analytical Results, LHAAP-50

		Location Code	50WW29 (Upper Shallow)										50WW06 (Lower Shallow)										50WW09 (Lower Shallow)					
		Sample ID	50WW29-191111		50WW29-200708		50WW29-201001		50WW29-210125		50WW29-210405		50WW06-191112		50WW06-200709		50WW06-201001		50WW06-210128		50WW06-210406		50WW09-191111-		50WW09-191111		50WW09-201005	
		Sample Date	11/11/2019		7/8/2020		10/1/2020		1/25/2021		4/5/2021		11/12/2019		7/9/2020		10/1/2020		1/28/2021		4/6/2021		11/11/2019		11/11/2019		10/5/2020	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		FD		REG		REG	
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	Result	Val Qual	Result	Val Qual	Result	Val Qual
	1,3-Dichloropropane	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	1,4-Dichlorobenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	2,2-Dichloropropane	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	2-Butanone	µg/L	NV	< 1	U									< 1	U									< 1	U	< 1	U		
	2-Chlorotoluene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	2-Hexanone	µg/L	NV	< 1	U									< 1	U									< 1	U	< 1	U		
	4-Chlorotoluene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	Acetone	µg/L	NV	< 2	U									< 2	U									< 2	U	< 2	U		
	Benzene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	Bromobenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	Bromochloromethane	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	Bromodichloromethane	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	Bromoform	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	Bromomethane	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	Carbon disulfide	µg/L	NV	< 1	U									< 1	U									< 1	U	< 1	U		
	Carbon tetrachloride	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	Chlorobenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	Chloroethane	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	Chloroform	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	Chloromethane	µg/L	NV	< 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	1.2		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	4		4.1		2.8	
	cis-1,3-Dichloropropene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	Dibromochloromethane	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	Dibromomethane	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	Dichlorodifluoromethane	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	Ethylbenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	Hexachlorobutadiene	µg/L	NV	< 1	U									< 1	U									< 1	U	< 1	U		
	Isopropylbenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	m,p-Xylenes	µg/L	NV	< 1	U									< 1	U									< 1	U	< 1	U		
	Methyl isobutyl ketone	µg/L	NV	< 1	U									< 1	U									< 1	U	< 1	U		
	Methylene chloride	µg/L	NV	< 1	U									< 1	U									< 1	U	< 1	U		
	Naphthalene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	n-Butylbenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	n-Propylbenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	o-Xylene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	p-Isopropyltoluene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	sec-Butylbenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	Styrene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	tert-Butylbenzene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	Tetrachloroethene	µg/L	5	< 0.5	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
	Toluene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	trans-1,2-Dichloroethene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	trans-1,3-Dichloropropene	µg/L	NV	< 0.5	U									< 0.5	U									< 0.5	U	< 0.5	U		
	Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	**41**		1.3		**14**		4.8		3.1		**30**		**30**		**21**	
	Trichlorofluoromethane	µg/L	NV	< 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	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-4
Year 1 RA-O Analytical Results, LHAAP-50

			Location Code	50WW14 (Lower Shallow)											
			Sample ID	50WW14-191113		50WW14-200709		50WW14-201001		50WW14-210128-		50WW14-210128		50WW14-210406	
			Sample Date	11/13/2019		7/9/2020		10/1/2020		1/28/2021		1/28/2021		4/6/2021	
			Sample Purpose	REG		REG		REG		FD		REG		REG	
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			0.8		2.1				3.3		13.4	
Field Tests															
	Dissolved oxygen	mg/L	NV	0.03		0.46		0.15				0.04		0.17	
	Ferrous Iron	mg/L	NV	1.67		1.83						3.77		1.6	
	Flow Rate	mL/Min	NV	100		100		100				100		100	
	Measured well depth	Ft BTOC	NV	60.71											
	Oxidation Reduction Potential	mV	NV	-20		-21		7				-125		-34	
	pH	pH_units	NV	6.53		6.75		6.26				5.91		6.34	
	Specific conductivity	mS/cm	NV	2.2		2.21		2.22				2.68		2.4	
	Temperature	deg. C	NV	16.55		20.87		18.53				16.6		18.30	
	Total Purge	Gal	NV	3.0		3.5		3.0				3.0		3.0	
	Turbidity	NTU	NV	300		125		159				207		76.2	
	Water Level at Reading Time	Ft BTOC	NV	20.43		18.63		19.24				19.1		18.05	
Gases															
	Carbon dioxide	µg/L	NV	97,000		85,000		170,000		340,000	J	380,000	J	98,000	J
	Ethane	µg/L	NV	< 0.47	U	< 0.47	U	< 0.47	U	< 0.47	U	< 0.47	U	< 0.47	U
	Ethylene	µg/L	NV	< 0.55	U	< 0.55	U	< 0.55	U	< 0.55	U	< 0.55	U	< 0.55	U
	Methane	µg/L	NV	1.8		1.9		2.2		1.5		1.8		3	
General Chemistry															
	Chloride	mg/L	NV	395		397		393		387		385		402	
	Nitrate	mg/L	10	< 0.1	U	< 0.1	U	< 0.1	U	< 0.1	U	< 0.1	U	< 0.1	U
	Sulfate	mg/L	NV	357		382		375		322		316		383	
	Total organic carbon	mg/L	NV	0.88		0.84	J	1.58		1.88		1.86		1.57	
Perchlorate															
	Perchlorate	µg/L	17	< 2	U	3.69		1.37		< 0.25	U	< 0.25	U	< 0.05	U
Volatiles															
	1,1,1,2-Tetrachloroethane	µg/L	NV	< 0.5	U										
	1,1,1-Trichloroethane	µg/L	NV	< 0.5	U										
	1,1,2,2-Tetrachloroethane	µg/L	NV	< 0.5	U										
	1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	NV	< 0.5	U										
	1,1,2-Trichloroethane	µg/L	NV	< 0.5	U										
	1,1-Dichloroethane	µg/L	NV	< 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
	1,1-Dichloropropene	µg/L	NV	< 0.5	U										
	1,2,3-Trichlorobenzene	µg/L	NV	< 0.5	U										
	1,2,3-Trichloropropane	µg/L	NV	< 0.5	U										
	1,2,4-Trichlorobenzene	µg/L	NV	< 0.5	U										
	1,2,4-Trimethylbenzene	µg/L	NV	< 0.5	U										
	1,2-Dibromo-3-chloropropane	µg/L	NV	< 0.5	U										
	1,2-Dibromoethane	µg/L	NV	< 0.5	U										
	1,2-Dichlorobenzene	µg/L	NV	< 0.5	U										
	1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	0.54	J	< 0.5	U	< 0.5	U
	1,2-Dichloropropane	µg/L	NV	< 0.5	U										
	1,3,5-Trimethylbenzene	µg/L	NV	< 0.5	U										
	1,3-Dichlorobenzene	µg/L	NV	< 0.5	U										

Table 2-4
Year 1 RA-O Analytical Results, LHAAP-50

		Location Code	50WW14 (Lower Shallow)											
		Sample ID	50WW14-191113		50WW14-200709		50WW14-201001		50WW14-210128-		50WW14-210128		50WW14-210406	
		Sample Date	11/13/2019		7/9/2020		10/1/2020		1/28/2021		1/28/2021		4/6/2021	
		Sample Purpose	REG		REG		REG		FD		REG		REG	
Parameter		Units	MCL/PCL/UTL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
	1,3-Dichloropropane	µg/L	NV	< 0.5	U										
	1,4-Dichlorobenzene	µg/L	NV	< 0.5	U										
	2,2-Dichloropropane	µg/L	NV	< 0.5	U										
	2-Butanone	µg/L	NV	< 1	U										
	2-Chlorotoluene	µg/L	NV	< 0.5	U										
	2-Hexanone	µg/L	NV	< 1	U										
	4-Chlorotoluene	µg/L	NV	< 0.5	U										
	Acetone	µg/L	NV	< 1	U										
	Benzene	µg/L	NV	< 0.5	U										
	Bromobenzene	µg/L	NV	< 0.5	U										
	Bromochloromethane	µg/L	NV	< 0.5	U										
	Bromodichloromethane	µg/L	NV	< 0.5	U										
	Bromoform	µg/L	NV	< 0.5	U										
	Bromomethane	µg/L	NV	< 0.5	U										
	Carbon disulfide	µg/L	NV	< 1	U										
	Carbon tetrachloride	µg/L	NV	< 0.5	U										
	Chlorobenzene	µg/L	NV	< 0.5	U										
	Chloroethane	µg/L	NV	< 0.5	U										
	Chloroform	µg/L	NV	< 0.5	U										
	Chloromethane	µg/L	NV	< 0.5	U										
	cis-1,2-Dichloroethene	µg/L	70	1.7		1.3		2.9		4.5		4.1		5.9	
	cis-1,3-Dichloropropene	µg/L	NV	< 0.5	U										
	Dibromochloromethane	µg/L	NV	< 0.5	U										
	Dibromomethane	µg/L	NV	< 0.5	U										
	Dichlorodifluoromethane	µg/L	NV	< 0.5	U										
	Ethylbenzene	µg/L	NV	< 0.5	U										
	Hexachlorobutadiene	µg/L	NV	< 0.5	U										
	Isopropylbenzene	µg/L	NV	< 0.5	U										
	m,p-Xylenes	µg/L	NV	< 1	U										
	Methyl isobutyl ketone	µg/L	NV	< 1	U										
	Methylene chloride	µg/L	NV	< 1	U										
	Naphthalene	µg/L	NV	< 0.5	U										
	n-Butylbenzene	µg/L	NV	< 0.5	U										
	n-Propylbenzene	µg/L	NV	< 0.5	U										
	o-Xylene	µg/L	NV	< 0.5	U										
	p-Isopropyltoluene	µg/L	NV	< 0.5	U										
	sec-Butylbenzene	µg/L	NV	< 0.5	U										
	Styrene	µg/L	NV	< 0.5	U										
	tert-Butylbenzene	µg/L	NV	< 0.5	U										
	Tetrachloroethene	µg/L	5	< 0.5	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U
	Toluene	µg/L	NV	< 0.5	U										
	trans-1,2-Dichloroethene	µg/L	NV	< 0.5	U										
	trans-1,3-Dichloropropene	µg/L	NV	< 0.5	U										
	Trichloroethene	µg/L	5	**37**		**32**		**74**	J+	**46**		**46**		**23**	
	Trichlorofluoromethane	µg/L	NV	< 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 2-4
Year 1 RA-O Analytical Results, LHAAP-50

Notes:

Blue Highlighting Indicates the concentration exceeds the MCL/PCL.

Some samples have been diluted due to the concentration(s) of one or more analytes exceeding the upper limit of the calibration curve.

< The analyte was not detected above the concentration shown.

µg/L - micrograms per liter

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.

cells/mL - cells per milliliter

deg. C - degrees Celsius

FD - field duplicate

FT BTOC - feet below top of casing

Gal - gallons

ID - identifier

MCL - maximum contaminant level

mg/L - milligrams per liter

mL/Min - milliliters per minute

mS/cm - microsiemens per centimeter

mV - millivolts

NA - not analyzed

NM - not measured

NTU - nephelometric turbidity unit

NV - No MCL/PCL is shown for analytes that are not contaminants of concern.

PCL - Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level (used for perchlorate, where no MCL has been established).

RA-O - remedial action operation

REG - regular sample

Std Units - standard pH units

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

Sample ID			50WW08-103013 [b]	50WW08-031114	50WW08-062414	50WW08-110614	50WW08-021715	50WW08-052115	50WW08-081715	50WW08-111615	50WW08-050316	50WW08-110216	50WW08-111317
Sample Date			10/30/2013	3/11/2014	6/24/2014	11/6/2014	2/17/2015	5/21/2015	8/17/2015	11/16/2015	5/3/2016	11/2/2016	11/13/2017
Well Completion Zone			Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow
Analyte	Units	MCL/PCL [a]	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	Result Val Qual
Perchlorate	µg/L	17	6,404	91.5	132	56.3	99	200	157	32.4 J	**146**	**126**	**27**
1,1-Dichloroethene	µg/L	7	<5 U	1.71 J	<5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<1 U	0.812 J	2.5 U	1 U
1,2-Dichloroethane	µg/L	5	<5 U	5.73	4.36 J	2.12 J	3.59	3.6	2.63	1.26	3.23	2.41 J	0.98 J
cis-1,2-Dichloroethene	µg/L	70	30.6	103	86	48.5	70.5	62.1	45.4	17.7	48.1	38	19
Tetrachloroethene	µg/L	5	<5 U	2.15	2.03 J	1.9 J	2.55	2 J	1.2 J	1.21	1.66	1.11 J	1
Trichloroethene	µg/L	5	247	845	814	685	852	712	375	288	**383**	**379**	**180** J
Vinyl Chloride	µg/L	2	<2 U	0.517 J	<2.5 U	<1.25 U	<1.25 U	<1.25 U	<1.25 U	<0.5 U	0.374 J	1.25 U	1 U

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

	Sample ID	50WW08-111317-FD		50WW08-180508		50WW08-181128		50WW08-190507		50WW08-191112		50WW09-110113	50WW09-031414	50WW09-061914	50WW09-111214	50WW09-021315	50WW09-052315
	Sample Date	11/13/2017		5/8/2018		11/28/2018		5/7/2019		11/12/2019		11/1/2013	3/14/2014	6/19/2014	11/12/2014	2/13/2015	5/23/2015
	Well Completion Zone	Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Lower Shallow	Lower Shallow	Lower Shallow	Lower Shallow	Lower Shallow	Lower Shallow
Analyte	Units	MCL/PCL [a]	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	Result Val Qual
Perchlorate	µg/L	17	**25**		**140**		51		230		83		<0.2 U	<0.2 U	<0.2 U	0.593	<0.2 U	0.196 J
1,1-Dichloroethene	µg/L	7	1 U		0.5 U		0.62	J	< 0.5	U	1.2		<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
1,2-Dichloroethane	µg/L	5	1.2 J		1.6		1.5		2.1		2.2		<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	1.11
cis-1,2-Dichloroethene	µg/L	70	23		15		20		20		39		<0.5 U	0.579 J	1.16	0.36 J	1.04	19.7
Tetrachloroethene	µg/L	5	1.1		0.5 U		1.1		0.75	J	1.3		<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.353 J	0.423 J
Trichloroethene	µg/L	5	**240** J		**130**		240	J	210		420		0.26 J	20.2	36.3	19.8	57 J	202
Vinyl Chloride	µg/L	2	1 U		0.5 U		0.66	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

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

Sample ID			50WW09-082115		50WW09FD-082115		50WW09-111115		50WW09FD-111115		50WW09-051216		50WW09-110316		50WW09-111017		50WW09-180515		50WW09-180515FD		50WW09-181203		50WW09-190507	
Sample Date			8/21/2015		8/21/2015		11/11/2015		11/11/2015		5/12/2016		11/3/2016		11/10/2017		5/15/2018		5/15/2018		12/3/2018		5/7/2019	
Well Completion Zone			Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow	
Analyte	Units	MCL/PCL [a]	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	Result	Val Qual
Perchlorate	µg/L	17	<0.2	U	<0.2	U	<1	U	<1	U	0.2	U	0.2	U	4	U	2.7	J	2.8	J	< 4	U	7.2	
1,1-Dichloroethene	µg/L	7	<1	U	<1	U	<1	U	<1	U	1	U	1	U	1	U	0.5	U	0.5	U	< 0.5	U	< 0.5	U
1,2-Dichloroethane	µg/L	5	1.66		1.83		1.09		1.05		0.688	J	0.519	J	1	U	0.5	U	0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70	29.4		29.5		16.3		16		15.1		10.8		1	U	2.4		2.2		7.3		2.2	
Tetrachloroethene	µg/L	5	0.536	J	0.34	J	0.404	J	0.393	J	0.452	J	0.344	J	1	U	0.5	U	0.5	U	< 0.5	U	< 0.5	U
Trichloroethene	µg/L	5	235		228		173		170		**154**		**126**		4.9		**83**		**74**		120		16	
Vinyl Chloride	µg/L	2	<0.5	U	<0.5	U	<0.5	U	<0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U	< 0.5	U	< 0.5	U

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

Sample ID			50WW09-190507-FD		50WW09-191111		50WW10-110513	50WW10FD-110513	50WW10-031414	50WW10-061914	50WW10FD-061914	50WW10-111214	50WW10-021315	50WW10-052315	50WW10-082115
Sample Date			5/7/2019		11/11/2019		11/5/2013	11/5/2013	3/14/2014	6/19/2014	6/19/2014	11/12/2014	2/13/2015	5/23/2015	8/21/2015
Well Completion Zone			Lower Shallow		Lower Shallow		Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate
Analyte	Units	MCL/PCL [a]	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	Result Val Qual
Perchlorate	µg/L	17	7.8		6.6		0.906	0.924	0.272 J	0.499	1.46	<0.2 U	<0.2 U	<0.2 U	<0.2 U
1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 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	<0.5 U
cis-1,2-Dichloroethene	µg/L	70	2.1		4.1		<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
Tetrachloroethene	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	<0.5 U
Trichloroethene	µg/L	5	16		30		<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.549 J	0.494 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	<0.5 U

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

	Sample ID	50WW10-111115		50WW10-051216		50WW10-110316		50WW10-111017		50WW10-180515		50WW10-181203		50WW10-190507		50WW11-102813		50WW11-031314		50WW11-062514		50WW11-110514	
	Sample Date	11/11/2015		5/12/2016		11/03/2016		11/10/2017		5/15/2018		12/3/2018		5/7/2019		10/28/2013		3/13/2014		6/25/2014		11/5/2014	
	Well Completion Zone	Intermediate		Intermediate		Intermediate		Intermediate		Intermediate		Intermediate		Intermediate		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow	
Analyte	Units	MCL/PCL [a]	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	Result	Val Qual
Perchlorate	µg/L	17	<0.2	U	0.2	U	0.2	U	4	U	2	U	< 4	U	< 4	U	21,700		2,570		8,910		22,300	
1,1-Dichloroethene	µg/L	7	<1	U	1	U	1	U	1	U	0.5	U	< 0.5	U	< 0.5	U	17.4		1.88	J	7.35		27.9	
1,2-Dichloroethane	µg/L	5	<0.5	U	0.5	U	0.5	U	1	U	0.5	U	< 0.5	U	< 0.5	U	15.2		2.28	J	6.01		24.3	
cis-1,2-Dichloroethene	µg/L	70	<0.5	U	0.5	U	0.5	U	1	U	0.5	U	< 0.5	U	< 0.5	U	43.9		4.46		12.6		70.8	
Tetrachloroethene	µg/L	5	<0.5	U	0.5	U	0.5	U	1	U	0.5	U	< 0.5	U	< 0.5	U	2.76		<1.25	U	0.678	J	5.03	
Trichloroethene	µg/L	5	0.766	J	0.5	U	0.5	U	1	U	0.5	U	< 0.5	U	< 0.5	U	2,750		362		831		3,550	
Vinyl Chloride	µg/L	2	<0.5	U	0.5	U	0.5	U	1	U	0.5	U	< 0.5	U	< 0.5	U	1.95		<1.25	U	0.516	J	3.53	J

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

	Sample ID	50WW11-021715		50WW11-052015		50WW11-081815		50WW11-111215		50WW11-051016		50WW11-110116		50WW11-111317		50WW11-180509		50WW11-181128		50WW11-181128-FD		50WW11-190506	
	Sample Date	2/17/2015		5/20/2015		8/18/2015		11/12/2015		5/10/2016		11/01/2016		11/13/2017		5/9/2018		11/28/2018		11/28/2018		5/6/2019	
	Well Completion Zone	Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow	
Analyte	Units	MCL/PCL [a]	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	Result	Val Qual
Perchlorate	µg/L	17	2,690		1,140		17,600		22,800		**1,300**		**13,400**		**20,000**		**1,000**		2,900		3,200		450	
1,1-Dichloroethene	µg/L	7	2.47 J		1.03 J		13.1		17.5 J		1.5 J		**21.4**		**33**		1.7		5.5		5.5		< 0.5	U
1,2-Dichloroethane	µg/L	5	2.42		1.2		16.7		22.9		1.84		**26.1**		**30**		2		5.6		5.4		0.75	J
cis-1,2-Dichloroethene	µg/L	70	6.86		2.4		36.3		54.1		5.35		67.4		**78**		11		18		17		3.1	
Tetrachloroethene	µg/L	5	0.951 J		0.275 J		2.48		<10 U		0.417 J		4.91		10 U		0.5 U		1.7		1.7		< 0.5	U
Trichloroethene	µg/L	5	512		230		1,550		2,670		**254**		**2,880**		**4,700**		**280**		700	J	710	J	95	
Vinyl Chloride	µg/L	2	<1 U		<0.5 U		1.29		<10 U		0.5 U		1.9		10 U		0.5 U		0.99	J	1		< 0.5	U

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

Sample ID			50WW11-191112		50WW12-102313		50WW12-031114		50WW12-062614		50WW12-110414		50WW12-021815		50WW12-052015		50WW12-081815		50WW12-111215		50WW12-051016		50WW12-110116	
Sample Date			11/12/2019		10/23/2013		3/11/2014		6/26/2014		11/4/2014		2/18/2015		5/20/2015		8/18/2015		11/12/2015		5/10/2016		11/1/2016	
Well Completion Zone			Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow	
Analyte	Units	MCL/PCL [a]	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	Result	Val Qual
Perchlorate	µg/L	17	**8,000**		23,600		35,700		35,500		14,300		30,600		59,200		17,300		37,900		**87,800**		**25,300**	
1,1-Dichloroethene	µg/L	7	**26**		<1 U		<1 U		<1 U		<1 U		<1 U		0.878 J		<1 U		<1 U		**7.35**		1.57 J	
1,2-Dichloroethane	µg/L	5	**28**		<0.5 U		<0.5 U		<0.5 U		<0.5 U		<0.5 U		0.389 J		<0.5 U		<0.5 U		3.93		0.952 J	
cis-1,2-Dichloroethene	µg/L	70	58		<0.5 U		<0.5 U		<0.5 U		<0.5 U		<0.5 U		<0.5 U		<0.5 U		<0.5 U		0.78 J		0.5 U	
Tetrachloroethene	µg/L	5	< 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		0.5 U	
Trichloroethene	µg/L	5	**3,300**		<0.5 U		0.257 J		0.411 J		<0.5 U		<0.5 U		33.9		5.59		17.6		**417**		**109**	
Vinyl Chloride	µg/L	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		0.5 U	

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

Sample ID			50WW12-111417		50WW12-180508		50WW12-180508FD		50WW12-181128		50WW12-190516		50WW12-190516-FD		50WW12-191112		50WW13-103013 [1]		50WW13-031214		50WW13-062514		50WW13-110514	
Sample Date			11/14/2017		5/8/2018		5/8/2018		11/28/2018		5/16/2019		5/16/2019		11/12/2019		10/30/2013		3/12/2014		6/25/2014		11/5/2014	
Well Completion Zone			Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow	
Analyte	Units	MCL/PCL [a]	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	Result	Val Qual
Perchlorate	µg/L	17	**21,000**		**91,000**		**89,000**		47,000		65,000		76,000		**47,000**		14.7		510		3,110		11,700	
1,1-Dichloroethene	µg/L	7	0.81	J	1.3		1.1		0.83	J	2.2		2.2		4.6		16.6		2.54		4.95	J	20.6	
1,2-Dichloroethane	µg/L	5	0.55	J	0.95	J	1		0.56	J	1.5		1.5		2.7		42		4.45		10.6		42.4	
cis-1,2-Dichloroethene	µg/L	70	1	U	0.5	U	0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	205		25		56.3		239	
Tetrachloroethene	µg/L	5	1	U	0.5	U	0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	7.2		1.06		1.39	J	7.05	J
Trichloroethene	µg/L	5	**41**		**79**		**74**		41	J	170		170		**280**		3,000		823		1,840		9,150	
Vinyl Chloride	µg/L	2	1	U	0.5	U	0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	<2	U	<0.5	U	<2.5	U	3.36	J

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

	Sample ID	50WW13-021715		50WW13-052015		50WW13-081915		50WW13-111215		50WW13B-051316		50WW13T-051316		50WW13-110116		50WW13-111317		50WW13-180509		50WW13-181129		50WW13-190506	
	Sample Date	2/17/2015		5/20/2015		8/19/2015		11/12/2015		5/13/2016		5/13/2016		11/1/2016		11/13/2017		5/9/2018		11/29/2018		5/6/2019	
	Well Completion Zone	Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow	
Analyte	Units	MCL/PCL [a]	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	Result	Val Qual
Perchlorate	µg/L	17	648		126		9,300		11,400		**256**		**493**		**8,650**		**13,000**		**640**		1,100		160	
1,1-Dichloroethene	µg/L	7	<5	U	0.978	J	13.5		<50	U	0.74	J	1.23	J	50	U	50	U	1.4		5.4		0.57	J
1,2-Dichloroethane	µg/L	5	4.99	J	1.78		31.5		43.4	J	2.24		4.31		**36.7**	J	**83**		**5.6**		12		1.3	
cis-1,2-Dichloroethene	µg/L	70	32.1		10.7		184		231		15.8		25		**228**		**410**		32		100		12	
Tetrachloroethene	µg/L	5	1.89	J	0.554	J	6.19		<25	U	0.555	J	0.846	J	25	U	50	U	1.6		4.6		< 0.5	U
Trichloroethene	µg/L	5	1,080		433		5,700		7,710	J	**322**		**529**		**6,050**		**13,000**		**620**		2,700		250	
Vinyl Chloride	µg/L	2	<2.5	U	<0.5	U	2.31	J	<25	U	0.5	U	0.259	J	25	U	50	U	0.5	U	1.4		< 0.5	U

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

Sample ID			50WW13-191113		50WW14-102813		50WW14-031214		50WW14-062514		50WW14-110514		50WW14-021715		50WW14-052015		50WW14-081915		50WW14-111215		50WW14-050316		50WW14-110116	
Sample Date			11/13/2019		10/28/2013		3/12/2014		6/25/2014		11/5/2014		2/17/2015		5/20/2015		8/19/2015		11/12/2015		5/3/2016		11/01/2016	
Well Completion Zone			Upper Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow	
Analyte	Units	MCL/PCL [a]	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	Result	Val Qual
Perchlorate	µg/L	17	**4,900**		5.45		0.256 J		0.121 J		5.37		0.381 J		2.06		2.19		7.5		0.47		0.2 U	
1,1-Dichloroethene	µg/L	7	**17**	J	<1 U		<1 U		<1 U		<1 U		<1 U		<1 U		<1 U		<1 U		1 U		1 U	
1,2-Dichloroethane	µg/L	5	**39**		1.16		<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	**230**		6.52		1.33		0.826 J		2.39		13.5		5.66		7.56		14.2		1.41		2.76	
Tetrachloroethene	µg/L	5	< 12	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		0.5 U	
Trichloroethene	µg/L	5	**7,300**		93.8		37.4		21.9		26.7		9.14		6.05		12		5.78		1.75		**10.9**	
Vinyl Chloride	µg/L	2	< 12	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		0.5 U	

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

	Sample ID	50WW14-111317		50WW14-180509		50WW14-181129		50WW14-190506		50WW15-102513		50WW15-031714		50WW15-061914		50WW15-110714		50WW15-021215		50WW15FD-021215		50WW15-052315	
	Sample Date	11/13/2017		5/9/2018		11/29/2018		5/6/2019		10/25/2013		3/17/2014		6/19/2014		11/7/2014		2/12/2015		2/12/2015		5/23/2015	
	Well Completion Zone	Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow	
Analyte	Units	MCL/PCL [a]	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	Result	Val Qual
Perchlorate	µg/L	17	4 U		2 U		1.9	J	< 4	U	<0.2 U		<0.2 U		<0.2 U		<0.2 U		0.942 J		1.34 J		<0.2 U	
1,1-Dichloroethene	µg/L	7	1 U		0.5 U		< 0.5	U	< 0.5	U	<1 U		<1 U		<1 U		<1 U		<1 U		<1 U		<1 U	
1,2-Dichloroethane	µg/L	5	1 U		1.2		< 0.5	U	< 0.5	U	<0.5 U		<0.5 U		<0.5 U		<0.5 U		0.258 J		<0.5 U		<0.5 U	
cis-1,2-Dichloroethene	µg/L	70	2.7		3.9		3.2		1.9		11.9		13.8		12.9		14.3		14.3		14.2		10.8	
Tetrachloroethene	µg/L	5	1 U		0.5 U		< 0.5	U	< 0.5	U	3.25		3.33		3.05		3.34		3.31		3.24		2.96	
Trichloroethene	µg/L	5	**8.2**		**33**		12		27		17.3		23.5		18.9		35.4		48.3		46.9		13	
Vinyl Chloride	µg/L	2	1 U		0.5 U		< 0.5	U	< 0.5	U	3.24		3.09		2.76		2.69		2.2		2.27		1.91	

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

Sample ID			50WW15-082015		50WW15FD-082015		50WW15-111115		50WW15FD-111115		50WW15-051116		50WW15-110216		50WW15-111017		50WW15-180507		50WW15-181130		50WW15-190523		50WW15-191108	
Sample Date			8/20/2015		8/20/2015		11/11/2015		11/11/2015		5/12/2016		11/02/2016		11/10/2017		5/7/2018		11/30/2018		5/23/2019		11/8/2019	
Well Completion Zone			Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow	
Analyte	Units	MCL/PCL [a]	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	Result	Val Qual
Perchlorate	µg/L	17	0.237 J		0.155 J		<1 U		<1 U		0.2 U		0.2 U		4 U		2 U		< 4	U	< 4	U	< 2	U
1,1-Dichloroethene	µg/L	7	<1 U		<1 U		<1 U		<1 U		1 U		1 U		1 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		1 U		0.5 U		< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70	10.1		10.4		7.16		6.89		6.31		6.63		4.2		3.1		5.9		2.9		5.5	
Tetrachloroethene	µg/L	5	1.92		2.01		1.83		1.76		1.86		1.89		1.3		1.5		2		0.87	J	2.1	
Trichloroethene	µg/L	5	15.2		15.1		8.2		8.05		**5.32**		**9.52**		3.6		3.5		9.1		2.3		**7.2**	
Vinyl Chloride	µg/L	2	1.25		1.38		0.966 J		0.923 J		0.5 U		1.18		0.85 J		0.5 U		1.5		< 0.5	U	1.7	

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

Sample ID			50WW16-102513		50WW16-032514		50WW16-062614		50WW16FD-062614		50WW16-111214		50WW16-021315		50WW16-052215		50WW16-082015		50WW16-111315		50WW16-051116		50WW16-110216	
Sample Date			10/25/2013		3/25/2014		6/26/2014		6/26/2014		11/12/2014		2/13/2015		5/22/2015		8/20/2015		11/13/2015		5/11/2016		11/2/2016	
Well Completion Zone			Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow	
Analyte	Units	MCL/PCL [a]	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	Result	Val Qual
Perchlorate	µg/L	17	0.284	J	<0.2	U	0.725		0.682		<0.2	U	<0.2	U	<0.2	U	<0.2	U	<0.2	U	0.101	J	0.846	
1,1-Dichloroethene	µg/L	7	<1	U	<1	U	<1	U	<1	U	<1	U	<1	U	<1	U	<1	U	<1	U	1	U	1	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	0.5	U
cis-1,2-Dichloroethene	µg/L	70	0.656	J	0.548	J	0.471	J	0.456	J	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	0.5	U	0.5	U
Tetrachloroethene	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	0.5	U
Trichloroethene	µg/L	5	18.1		11.4		12		11.6		1.05		0.391	J	<0.5	U	1.5		0.986	J	0.287	J	2.72	
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	0.5	U

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

			Sample ID	50WW16-111417		50WW16-180509		50WW16-181128		50WW16-190506		50WW17-102513		50WW17-032514		50WW17-062014		50WW17-111114		50WW17-021315		50WW17-052215		50WW17-081915	
			Sample Date	11/14/2017		5/9/2018		11/28/2018		5/6/2019		10/25/2013		3/25/2014		6/20/2014		11/11/2014		2/13/2015		5/22/2015		8/19/2015	
			Well Completion Zone	Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Fully Penetrating Shallow		Fully Penetrating Shallow		Fully Penetrating Shallow		Fully Penetrating Shallow		Fully Penetrating Shallow		Fully Penetrating Shallow		Fully Penetrating Shallow	
Analyte	Units	MCL/PCL [a]		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	Result	Val Qual
Perchlorate	µg/L	17		4 U		2 U		< 4	U	< 4	U	0.51		<0.2 U		1.76		<0.2 U		<0.2 U		<0.2 U		0.193 J	
1,1-Dichloroethene	µg/L	7		1 U		0.5 U		< 0.5	U	< 0.5	U	<1 U		<1 U		<1 U		<1 U		<1 U		<1 U		<1 U	
1,2-Dichloroethane	µg/L	5		1 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		<0.5 U	
cis-1,2-Dichloroethene	µg/L	70		1 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		<0.5 U	
Tetrachloroethene	µg/L	5		1 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		<0.5 U	
Trichloroethene	µg/L	5		1.7 U		0.5 U		1.9	J	0.61	J	<0.5 U		<0.5 U		0.516 J		<0.5 U		<0.5 U		<0.5 U		<0.5 U	
Vinyl Chloride	µg/L	2		1 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		<0.5 U	

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

	Sample ID	50WW17-110915		50WW17B-051316		50WW17M-051316		50WW17T-051316		50WW17-110416		50WW17-111017		50WW17-180515		50WW17-181130		50WW17-190516		50WW17-191108		50WW18-102313	
	Sample Date	11/9/2015		5/13/16		5/13/16		5/13/16		11/4/2016		11/10/2017		5/15/2018		11/30/2018		5/16/2019		11/8/2019		10/23/2013	
	Well Completion Zone	Fully Penetrating Shallow		Fully Penetrating Shallow		Fully Penetrating Shallow		Fully Penetrating Shallow		Fully Penetrating Shallow		Fully Penetrating Shallow		Fully Penetrating Shallow		Fully Penetrating Shallow		Fully Penetrating Shallow		Fully Penetrating Shallow		Upper Shallow	
Analyte	Units	MCL/PCL [a]	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	Result	Val Qual
Perchlorate	µg/L	17	<0.4	U	0.2	U	0.119	J	0.149	J	0.2	U	4	U	2	U	< 4	U	< 4	U	2	U	<0.2	U
1,1-Dichloroethene	µg/L	7	<1	U	1	U	1	U	1	U	1	U	1	U	0.5	U	< 0.5	U	< 0.5	U	0.5	U	<1	U
1,2-Dichloroethane	µg/L	5	<0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	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	1	U	0.5	U	< 0.5	U	< 0.5	U	0.5	U	<0.5	U
Tetrachloroethene	µg/L	5	<0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	< 0.5	U	< 0.5	U	0.5	U	<0.5	U
Trichloroethene	µg/L	5	<0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	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	1	U	0.5	U	< 0.5	U	< 0.5	U	0.5	U	<0.5	U

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

	Sample ID	50WW18-032614		50WW18-062414		50WW18-110414		50WW18-021815		50WW18-052815		50WW18-081715		50WW18-111615		50WW18-050316		50WW18-110316		50WW18-111017		50WW18-180507	
	Sample Date	3/26/2014		6/24/2014		11/4/2014		2/18/2015		5/28/2015		8/17/2015		11/16/2015		5/3/2016		11/03/2016		11/10/2017		5/7/2018	
	Well Completion Zone	Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow	
Analyte	Units	MCL/PCL [a]	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	Result	Val Qual
Perchlorate	µg/L	17	<0.2	U	0.172	J	<0.2	U	0.258	J	<0.2	U	0.144	J	<1	U	0.2	U	0.2	U	4	U	2	U
1,1-Dichloroethene	µg/L	7	<1	U	<1	U	<1	U	<1	U	<1	U	<1	U	<1	U	1	U	1	U	1	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	1	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	1	U	0.5	U
Tetrachloroethene	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	1	UJ	0.5	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	1	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	1	U	0.5	U

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

	Sample ID	50WW18-181130		50WW18-190516		50WW18-191108		50WW19-011414	50WW19-032514	50WW19-062014	50WW19-111114	50WW19-021315	50WW19-052215	50WW19FD-052215	50WW19-082115
	Sample Date	11/30/2018		5/16/2019		11/8/2019		1/14/2014	3/25/2014	6/20/2014	11/11/2014	2/13/2015	5/22/2015	5/22/2015	8/21/2015
	Well Completion Zone	Upper Shallow		Upper Shallow		Upper Shallow		Fully Penetrating Shallow	Fully Penetrating Shallow	Fully Penetrating Shallow	Fully Penetrating Shallow	Fully Penetrating Shallow	Fully Penetrating Shallow	Fully Penetrating Shallow	Fully Penetrating Shallow
Analyte	Units	MCL/PCL [a]	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	Result Val Qual
Perchlorate	µg/L	17	< 4	U	< 4	U	< 2	U	<0.2 U	<0.2 U	0.48	<0.2 U	<0.2 U	0.305 J	0.198 J	<0.2 U
1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 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	<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	<0.5 U
Tetrachloroethene	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	<0.5 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	<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	<0.5 U

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

Sample ID			50WW19-110915	50WW19B-051316	50WW19M-051316	50WW19T-051316	50WW19-110416	50WW20-110713	50WW20-031314	50WW20FD-031314	50WW20-061914	50WW20-111114	50WW20FD-111114
Sample Date			11/9/2015	5/3/2016	5/13/2016	5/13/2016	11/04/2016	11/7/2013	3/13/2014	3/13/2014	6/19/2014	11/11/2014	11/11/2014
Well Completion Zone			Fully Penetrating Shallow	Fully Penetrating Shallow	Fully Penetrating Shallow	Fully Penetrating Shallow	Fully Penetrating Shallow	Fully Penetrating Shallow	Fully Penetrating Shallow	Fully Penetrating Shallow	Fully Penetrating Shallow	Fully Penetrating Shallow	Fully Penetrating Shallow
Analyte	Units	MCL/PCL [a]	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	Result Val Qual
Perchlorate	µg/L	17	<0.2 U	0.2 U	0.2 U	0.338 J	0.2 U	<0.2 U	0.697	0.673	<0.2 U	<0.2 U	<0.2 U
1,1-Dichloroethene	µg/L	7	<1 U	1 U	1 U	1 U	1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 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	<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	<0.5 U
Tetrachloroethene	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	<0.5 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	<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	<0.5 U

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

	Sample ID	50WW20-021215	50WW20-052615	50WW20-082115	50WW20-111015	50WW20-51116	50WW21-102513	50WW21FD-102513	50WW21-032514	50WW21-062014	50WW21FD-062014	50WW21-111314
	Sample Date	2/12/2015	5/26/2015	8/21/2015	11/10/2015	5/11/2016	10/25/2013	10/25/2013	3/25/2014	6/20/2014	6/20/2014	11/13/2014
	Well Completion Zone	Fully Penetrating Shallow	Fully Penetrating Shallow	Fully Penetrating Shallow	Fully Penetrating Shallow	Fully Penetrating Shallow	Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow
Analyte	Units	MCL/PCL [a]	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
Perchlorate	µg/L	17	0.168 J	<0.2 U	<0.2 U	<0.2 U	0.2 U	0.731	0.818	0.606	0.964	0.934	0.779
1,1-Dichloroethene	µg/L	7	<1 U	<1 U	<1 U	<1 U	1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 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	<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	<0.5 U
Tetrachloroethene	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	<0.5 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	<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	<0.5 U

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

Sample ID			50WW21FD-111314		50WW21-021215		50WW21-052315		50WW21FD-052315		50WW21-082015		50WW21-111015		50WW21-051216		50WW21-110316		50WW21-111017		50WW21-180507		50WW21-181130	
Sample Date			11/13/2014		2/12/2015		5/23/2015		5/23/2015		8/20/2015		11/10/2015		5/12/2016		11/03/2016		11/10/2017		5/7/2018		11/30/2018	
Well Completion Zone			Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow	
Analyte	Units	MCL/PCL [a]	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	Result	Val Qual
Perchlorate	µg/L	17	0.779		0.878		0.502		0.516		0.67		1.21	J	0.398	J	0.418		4	U	2	U	< 4	U
1,1-Dichloroethene	µg/L	7	<1	U	<1	U	<1	U	<1	U	<1	U	<1	U	1	U	1	U	1	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	1	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	1	U	0.5	U	< 0.5	U
Tetrachloroethene	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	U	0.5	U	< 0.5	U
Trichloroethene	µg/L	5	<0.5	U	<0.5	U	0.447	J	<0.5	U	<0.5	U	<0.5	U	0.5	U	0.5	U	1	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	1	U	0.5	U	< 0.5	U

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

Sample ID			50WW21-190516		50WW22-102313	50WW22-031214	50WW22-062414	50WW22-110614	50WW22-021715	50WW22-052115	50WW22-081815	50WW22-111615	50WW22-051016	50WW22-110216
Sample Date			5/16/2019		10/23/2013	3/12/2014	6/24/2014	11/6/2014	2/17/2015	5/21/2015	8/18/2015	11/16/2015	5/10/2016	11/2/2016
Well Completion Zone			Upper Shallow		Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow
Analyte	Units	MCL/PCL [a]	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	Result Val Qual
Perchlorate	µg/L	17	< 4	U	6.97	1.54	2.29	1.06	1.51	2.92	3.62	0.642 J	1.46	1.02
1,1-Dichloroethene	µg/L	7	< 0.5	U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	1 U	1 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	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	0.5 U
Tetrachloroethene	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	0.5 U
Trichloroethene	µg/L	5	< 0.5	U	<0.5 U	<0.5 U	<0.5 U	0.339 J	<0.5 U	<0.5 U	<0.5 U	0.454 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	0.5 U	0.5 U

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

	Sample ID	50WW22-111317		50WW22-180509		50WW22-181203		50WW22-190506		50WW22-191112		50WW23-102913	50WW23-031314	50WW23-062614	50WW23-110414	50WW23-021815	50WW23-052015
	Sample Date	11/13/2017		5/9/2018		12/3/2018		5/6/2019		11/12/2019		10/29/2013	3/13/2014	6/26/2014	11/4/2014	2/18/2015	5/20/2015
	Well Completion Zone	Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow
Analyte	Units	MCL/PCL [a]	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
Perchlorate	µg/L	17	4	U	1.1	J	< 4	U	< 4	U	< 2	U	0.336 J	0.227 J	0.182 J	<0.2 U	<0.2 U	23.3	
1,1-Dichloroethene	µg/L	7	1	U	0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	
1,2-Dichloroethane	µg/L	5	1	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	<0.5 U	
cis-1,2-Dichloroethene	µg/L	70	1	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	<0.5 U	
Tetrachloroethene	µg/L	5	1	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	<0.5 U	
Trichloroethene	µg/L	5	1	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	<0.5 U	
Vinyl Chloride	µg/L	2	1	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	<0.5 U	

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

	Sample ID	50WW23-081715		50WW23-111615		50WW23-051016		50WW23-110116		50WW23-111417		50WW23-180515		50WW23-181203		50WW23-190507		50WW23-190507		50WW24-102913		50WW24-032614	
	Sample Date	8/17/2015		11/16/2015		5/10/2016		11/01/2016		11/14/2017		5/15/2018		12/3/2018		5/7/2019		11/13/2019		10/29/2013		3/26/2014	
	Well Completion Zone	Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow	
Analyte	Units	MCL/PCL [a]	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	Result	Val Qual
Perchlorate	µg/L	17	0.527		<1	U	2.15		4.76		4	U	2	U	< 4	U	< 4	U	< 2	U	0.479		<0.2	U
1,1-Dichloroethene	µg/L	7	<1	U	<1	U	1	U	1	U	1	U	0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	<1	U	<1	U
1,2-Dichloroethane	µg/L	5	<0.5	U	<0.5	U	0.5	U	0.5	U	1	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	1	U	0.5	U	< 0.5	U	< 0.5	UJ	< 0.5	U	<0.5	U	<0.5	U
Tetrachloroethene	µg/L	5	<0.5	U	<0.5	U	0.5	U	0.5	U	1	U	0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	<0.5	U	<0.5	U
Trichloroethene	µg/L	5	<0.5	U	<0.5	U	0.5	U	0.5	U	1	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	1	U	0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	<0.5	U	<0.5	U

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

	Sample ID	50WW24-062614		50WW24-110414		50WW24-021815		50WW24-052815		50WW24-081715		50WW24-111615		50WW24-051016		50WW24-110316		50WW24-111017		50WW24-180507		50WW24-181130	
	Sample Date	6/26/2014		11/4/2014		2/18/2015		5/28/2015		8/17/2015		11/16/2015		5/10/2016		11/3/2016		11/10/2017		5/7/2018		11/30/2018	
	Well Completion Zone	Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow	
Analyte	Units	MCL/PCL [a]	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	Result	Val Qual
Perchlorate	µg/L	17	110		<0.2	U	<0.2	U	<0.2	U	<0.2	U	<1	U	**36.8**		0.2	U	4	U	2	U	< 4	U
1,1-Dichloroethene	µg/L	7	<1	U	<1	U	<1	U	<1	U	<1	U	<1	U	1	U	1	U	1	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	1	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	1	U	0.5	U	< 0.5	U
Tetrachloroethene	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	U	0.5	U	< 0.5	U
Trichloroethene	µg/L	5	<0.5	U	<0.5	U	<0.5	U	0.268	J	<0.5	U	<0.5	U	0.5	U	0.5	U	1	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	1	U	0.5	U	< 0.5	U

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

	Sample ID	50WW24-190507		50WW24-191108		50WW25-102313	50WW25-032614	50WW25-062414	50WW25-110614	50WW25-021815	50WW25-052815	50WW26-110613	50WW26FD-110613	50WW26-032614
	Sample Date	5/7/2019		11/8/2019		10/23/2013	3/26/2014	6/24/2014	11/6/2014	2/18/2015	5/28/2015	11/6/2013	11/6/2013	3/26/2014
	Well Completion Zone	Upper Shallow		Upper Shallow		Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow	Upper Shallow	Lower Shallow	Lower Shallow	Lower Shallow
Analyte	Units	MCL/PCL [a]	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	Result Val Qual
Perchlorate	µg/L	17	< 4 U	2	U	<0.2 U	9.13	31.8	17.8	42.2	15	<0.2 U	<0.2 U	<0.2 U
1,1-Dichloroethene	µg/L	7	< 0.5 U	0.5	U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 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	<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	<0.5 U
Tetrachloroethene	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	<0.5 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	<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	<0.5 U

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

Sample ID			50WW26FD-032614		50WW26-062014		50WW26-111314		50WW26-021315		50WW26-052315		50WW26-082015		50WW26-111015		50WW26FD-111015		50WW26-050316		50WW26-110216		50WW27-110613	
Sample Date			3/26/2014		6/20/2014		11/13/2014		2/13/2015		5/23/2015		8/20/2015		11/10/2015		11/10/2015		5/3/2016		11/2/2016		11/6/2013	
Well Completion Zone			Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow	
Analyte	Units	MCL/PCL [a]	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	Result	Val Qual
Perchlorate	µg/L	17	<0.2 U		<0.2 U		<0.2 U		<0.2 U		<0.2 U		<0.2 U		<1 U		<1 U		0.2 U		0.2 U		<0.2 U	
1,1-Dichloroethene	µg/L	7	<1 U		<1 U		<1 U		<1 U		<1 U		<1 U		<1 U		<1 U		1 U		1 U		<1 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		<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		0.515 J		<0.5 U	
Tetrachloroethene	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		<0.5 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		<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		<0.5 U	

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

Sample ID			50WW27-031714	50WW27FD-031714	50WW27-061914	50WW27-110714	50WW27FD-110714	50WW27-021215	50WW27-052315	50WW27-082015	50WW27-111115	50WW27-051216	50WW27-110216
Sample Date			3/17/2014	3/17/2014	6/19/2014	11/7/2014	11/7/2014	2/12/2015	5/23/2015	8/20/2015	11/11/2015	5/12/2016	11/2/2016
Well Completion Zone			Lower Shallow	Lower Shallow	Lower Shallow	Lower Shallow	Lower Shallow	Lower Shallow	Lower Shallow	Lower Shallow	Lower Shallow	Lower Shallow	Lower Shallow
Analyte	Units	MCL/PCL [a]	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	Result Val Qual
Perchlorate	µg/L	17	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<1 U	0.2 U	0.124 J
1,1-Dichloroethene	µg/L	7	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	1 U	1 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	0.5 U
cis-1,2-Dichloroethene	µg/L	70	0.611 J	0.518 J	0.871 J	0.529 J	0.493 J	0.691 J	0.709 J	0.33 J	0.581 J	0.515 J	0.498 J
Tetrachloroethene	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	0.5 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	0.5 U
Vinyl Chloride	µg/L	2	<0.5 U	<0.5 U	0.251 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

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

Sample ID			50WW27-111017		50WW27-180507		50WW27-181203		50WW27-181203-FD		50WW27-190523		50WW27-191108		50WW28-070914		50WW28-111214		50WW28-021715		50WW28FD-021715		50WW28-052615	
Sample Date			11/10/2017		5/7/2018		12/3/2018		12/3/2018		5/23/2019		11/8/2019		7/9/2014		11/12/2014		2/17/2015		2/17/2015		5/26/2015	
Well Completion Zone			Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Lower Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow	
Analyte	Units	MCL/PCL [a]	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	Result	Val Qual
Perchlorate	µg/L	17	4 U		2 U		< 4	U	< 4	U	< 4	U	2	U	2.57		2.01 J		1.44		1.44		1.04	
1,1-Dichloroethene	µg/L	7	1 U		0.5 U		< 0.5	U	< 0.5	U	< 0.5	U	0.5	U	<1 U		<1 U		<1 U		<1 U		<1 U	
1,2-Dichloroethane	µg/L	5	1 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		<0.5 U	
cis-1,2-Dichloroethene	µg/L	70	1 U		0.5 U		< 0.5	U	< 0.5	U	0.74	J	0.92	J	<0.5 U		<0.5 U		<0.5 U		<0.5 U		<0.5 U	
Tetrachloroethene	µg/L	5	1 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		<0.5 U	
Trichloroethene	µg/L	5	1 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		<0.5 U	
Vinyl Chloride	µg/L	2	1 U		0.5 U		0.66	J	0.66	J	< 0.5	U	0.5	U	<0.5 U		<0.5 U		<0.5 U		<0.5 U		<0.5 U	

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

	Sample ID	50WW28FD-052615		50WW28-082015		50WW28-051116		50WW28-111315		50WW29-191111		GPW1-021715		GPW1-050815		GPW1-052215		GPW1-111315		GPW1-2/11/2016		GPW1-5/13/2016	
	Sample Date	5/26/2015		8/20/2015		5/11/2016		11/13/2015		11/11/2019		2/17/2015		5/8/2015		5/22/2015		11/13/2015					
	Well Completion Zone	Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Surface Water		Surface Water		Surface Water		Surface Water		Surface Water		Surface Water	
Analyte	Units	MCL/PCL [a]	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	Result	Val Qual
Perchlorate	µg/L	17	1.05		0.688		1.12		1.64		2	U	0.737		0.156	J	0.213	J	0.139	J	0.447		6.59	
1,1-Dichloroethene	µg/L	7	<1	U	<1	U	1	U	<1	U	0.5	U	<1	U	<1	U	<1	U	<1	U	NA		NA	
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	NA		NA	
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	NA		NA	
Tetrachloroethene	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	NA		NA	
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	NA		NA	
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	NA		NA	

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

	Sample ID	GPW1-081016		GPW1-111316		GPW1A-021715		GPW1A-050815		GPW1A-021116		GPW1A-050116		GPW1A-081016		GPW1A-110116		LHSMW54-941209		LHSMW54-960212		LHSMW54-960821		LHSMW54-980520	
	Sample Date	8/1/2016		11/13/2016		2/17/2015		5/8/2015		2/11/2016		5/1/2016		8/1/16		11/1/2016		12/9/1994		2/12/1996		8/21/1996		5/20/1998	
	Well Completion Zone	Surface Water		Surface Water		Surface Water		Surface Water		Surface Water		Surface Water		Surface Water		Surface Water		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow	
Analyte	Units	MCL/PCL [a]	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	Result	Val Qual	Result	Val Qual
Perchlorate	µg/L	17	0.162	J	0.301	J	38.2		16		NA		NA		0.137	J	NA		NA		NA		NA		NA	
1,1-Dichloroethene	µg/L	7	NA		NA		<1	U	<1	U	NA		NA		NA		NA		<5	U	NA		<0.2	U	<1	U
1,2-Dichloroethane	µg/L	5	NA		NA		<0.5	U	<0.5	U	NA		NA		NA		NA		<5	U	NA		<0.31	U	<1	U
cis-1,2-Dichloroethene	µg/L	70	NA		NA		<0.5	U	<0.5	U	NA		NA		NA		NA		NA		NA		<0.2	U	0.7	
Tetrachloroethene	µg/L	5	NA		NA		<0.5	U	<0.5	U	NA		NA		NA		NA		<5	U	NA		<0.25	U	<1	U
Trichloroethene	µg/L	5	NA		NA		<0.5	U	<0.5	U	NA		NA		NA		NA		12		11		15.7		210	
Vinyl Chloride	µg/L	2	NA		NA		<0.5	U	<0.5	U	NA		NA		NA		NA		NA		NA		<0.24	U	<1	U

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-5
Historical COC Concentrations, LHAAP-50

			Sample ID	LHSMW54-000521		LHSMW54-020309		LHSMW54-020921		LHSMW54-100806		LHSMW54-101707		LHSMW54-110713		LHSMW54-021815		LHSMW54-052715		LHSMW54-111315	
			Sample Date	5/21/2000		3/9/2002		9/21/2002		8/6/2010		10/17/2007		11/7/2013		2/18/2015		5/27/2015		11/13/2015	
			Well Completion Zone	Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow		Upper Shallow	
Analyte	Units	MCL/PCL [a]		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
Perchlorate	µg/L	17		<1 U		<4 U		<4 U		<0.2 U		<1 U		<0.2 U		0.271 J		<0.2 U		<1 UJ	
1,1-Dichloroethene	µg/L	7		NA		NA		NA		<2.5 U		<1 U		<1 U		<1 U		<1 U		<1 U	
1,2-Dichloroethane	µg/L	5		NA		NA		NA		<2.5 U		<1 U		<0.5 U		<0.5 U		<0.5 U		<0.5 U	
cis-1,2-Dichloroethene	µg/L	70		NA		NA		NA		0.657 J		1.59		0.392 J		0.316 J		0.261 J		0.323 J	
Tetrachloroethene	µg/L	5		NA		NA		NA		<2.5 U		<1 U		<0.5 U		<0.5 U		<0.5 U		<0.5 U	
Trichloroethene	µg/L	5		NA		NA		NA		369		601		112		93.8		95.9		88.3	
Vinyl Chloride	µg/L	2		NA		NA		NA		<2.5 U		<1 U		<0.5 U		<0.5 U		<0.5 U		<0.5 U	

Notes:

Blue Highlighting indicates analyte detected above MCL/PCL.

[a] Cleanup goal is MCL except for perchlorate. For perchlorate, Texas Risk Reduction Program groundwater residential PCL is used.

[b] Only limited data validation possible; Not used in plume delineation.

µg/L - micrograms per liter

J - estimated value; analyte concentration was less than the limit of quantification.

U - Not detected. The analyte was analyzed for, but not detected above the limit of detection.

COC - contaminants of concern

ID - identifier

MCL - maximum contaminant level

NA - not analyzed

PCL - Texas residential groundwater protective concentration level

Val Qual - validation qualifier

Table 2-6
Groundwater Elevation versus Bottom of Drainage Channel Elevation, LHAAP-50

Surface Water Sample Location	Bottom of Drainage Channel (ft amsl)	Nearest Well	Groundwater Elevation during Surface Water Sampling (ft amsl)	Groundwater Elevation Measurement Date
50SW06	182.902	50WW16	179.03	7/9/2020
			178.16	10/5/2020
			178.37	1/28/2021
			179.71	4/5/2021

Notes:

ft amsl - feet above mean sea level

Table 3-1
Mann-Kendall Trend Summary, LHAAP-50

Monitoring Well	Perchlorate	TCE	cis-1,2-DCE	1,1-DCE	1,2-DCA
50WW05	–	Stable	**Significantly increasing**	–	–
50WW06	**Significantly decreasing**	**Significantly decreasing**	–	–	–
50WW08	No trend	Stable	–	–	–
50WW09	–	Stable	–	–	–
50WW11	**Significantly decreasing**	Stable	No trend	No trend	Stable
50WW12	**Significantly increasing**	**Significantly increasing**	–	–	–
50WW13	No trend	Stable	Stable	No trend	Stable
50WW14	–	No trend	–	–	–
50WW15	–	**Significantly decreasing**	–	–	–

Notes:

Bolded cells indicate a statistically significant trend with >95% confidence.

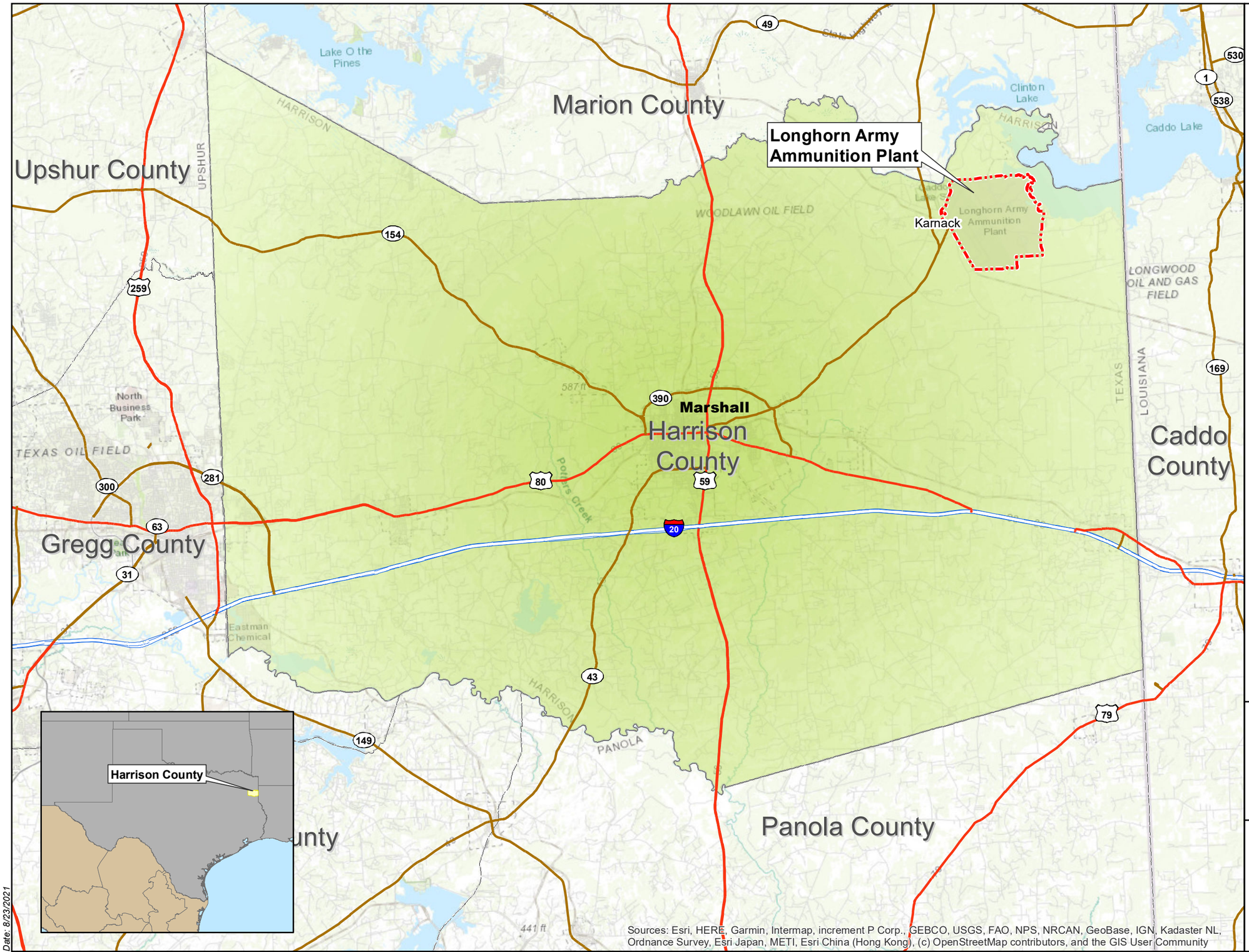
"Significant" refers to the statistical confidence in the trend.

DCA - dichloroethane

DCE - dichloroethene

TCE - trichloroethene

Figures



Date: 8/23/2021

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP50\RAO\Year7\LHAAP_LocationMap.mxd

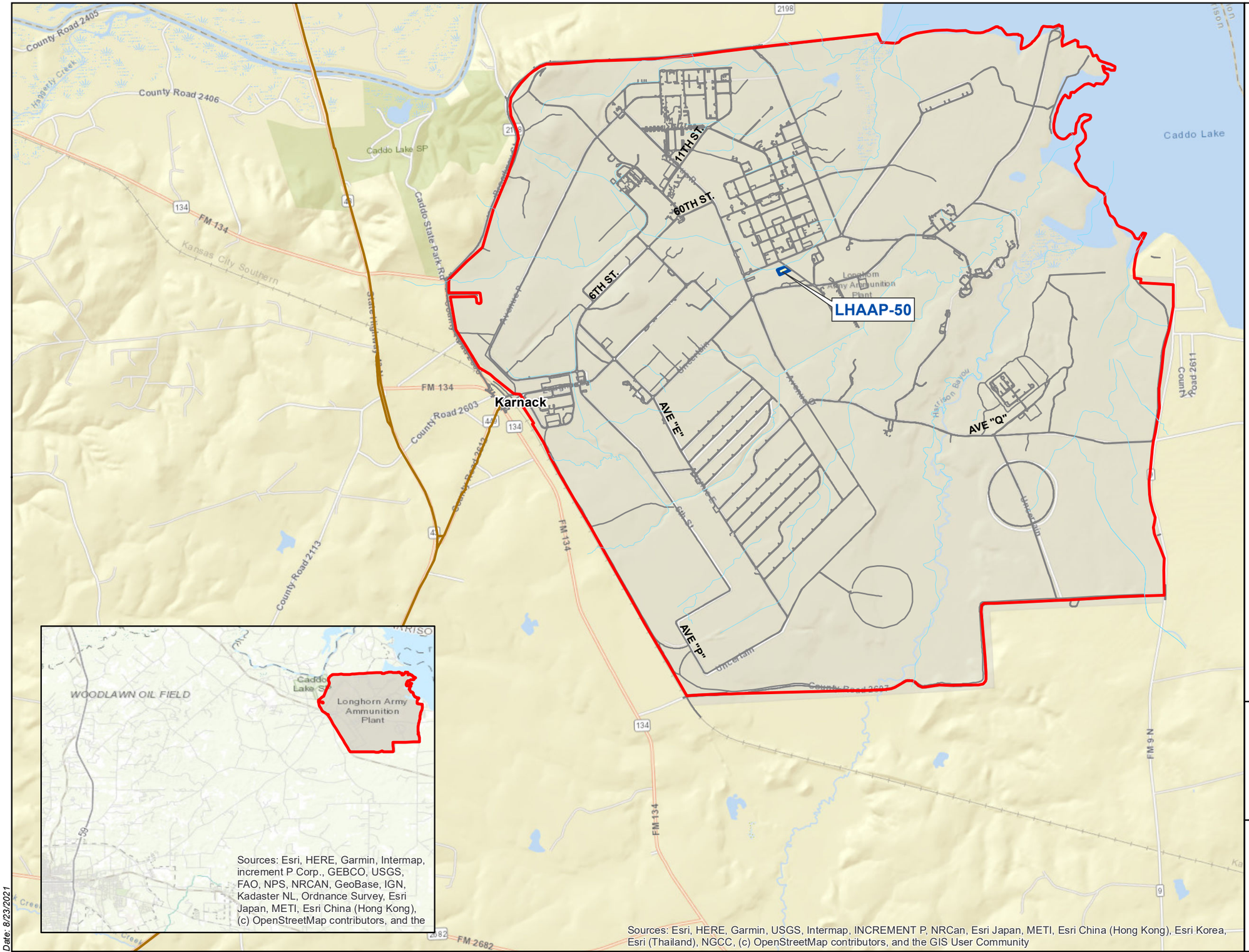
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

bhate APTIM

Figure 1-1

LHAAP Location Map
LHAAP-50 Seventh Annual RA-O Report
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS



Stream
Road
LHAAP Boundary
LHAAP-50 Site Boundary

N

0 1,500 3,000 Feet

U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

bhate APTIM

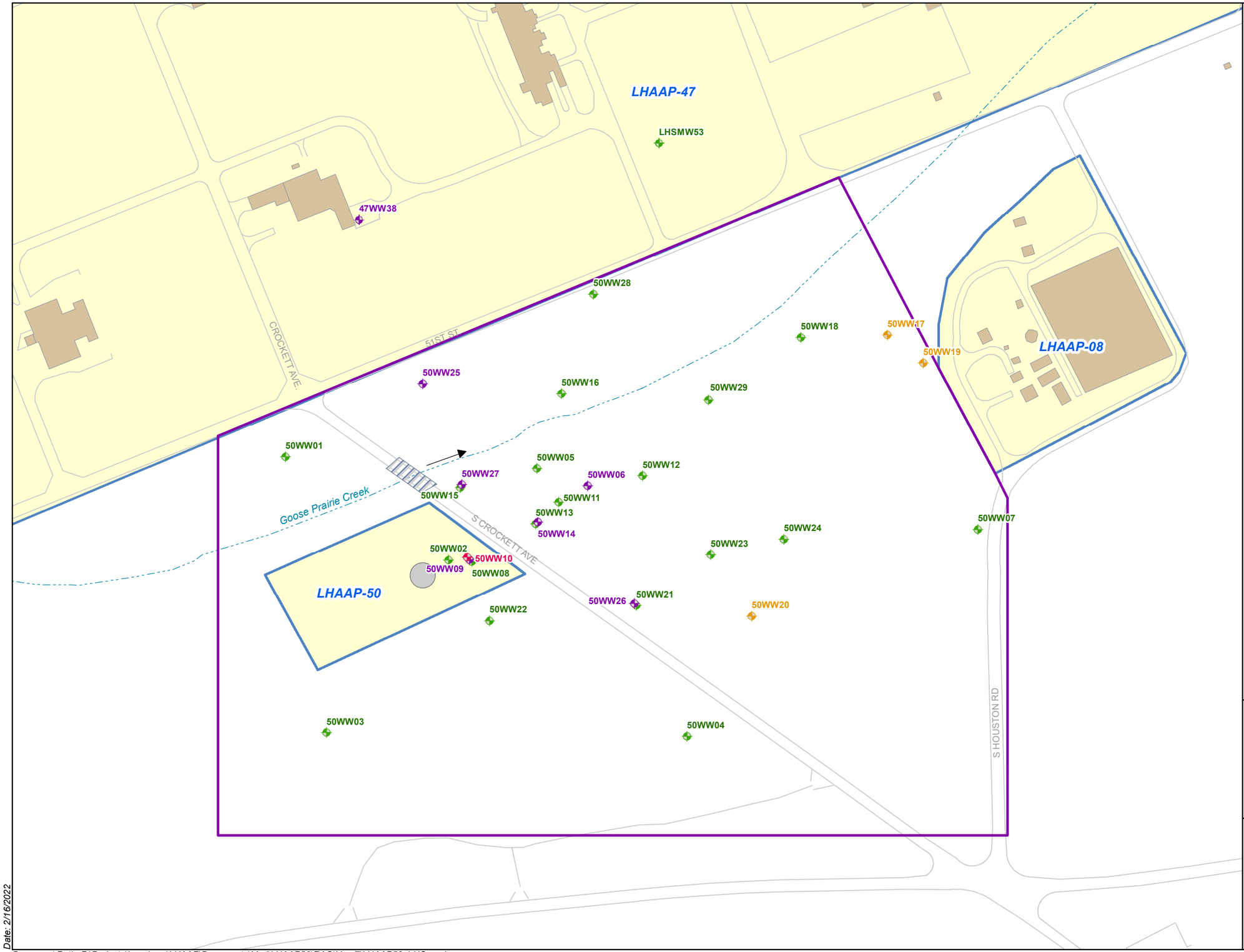
Figure 1-2

LHAAP Site Location Map
LHAAP-50 Seventh Annual RA-O Report

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 8/23/2021

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP50\RAO\Year7\LHAAP50_SiteLocationMap.mxd



- Lower Shallow Monitoring Well
- Upper Shallow Monitoring Well
- Fully Penetrating Shallow Monitoring Well
- Intermediate Monitoring Well
- Goose Praire Creek Flow Direction
- Goose Prairie Creek
- Roads
- Land Use Control Boundary
- Bridges
- Former Storage Tank Location
- Buildings
- Site Boundaries

Note:
LUC boundary established in the 2016 Final Remedial Action Completion Report, LHAAP-50, Former Sump Water Tank (AECOM 2016)

N

0 75 150 Feet

U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

bhate APTIM

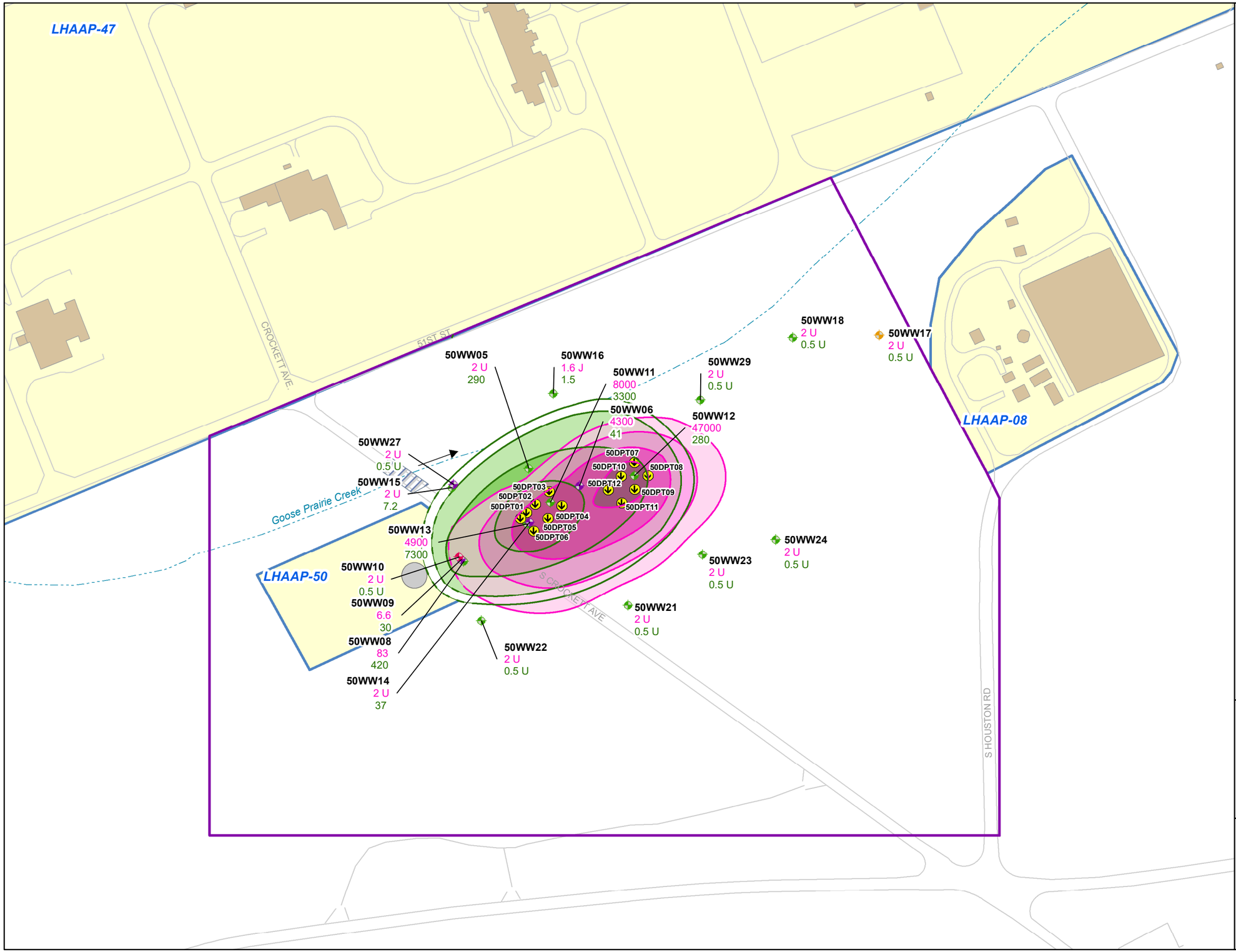
Figure 1-3

Land Use Control Boundary
LHAAP-50 Seventh Annual RA-O Report

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 2/16/2022

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP50\RAO\Year7\LHAAP50_LUC.mxd



- Lower Shallow Monitoring Well
- Upper Shallow Monitoring Well
- Fully Penetrating Shallow Monitoring Well
- Intermediate Monitor Well
- ISB DPT Point
- Goose Praire Creek Flow Direction
- Goose Prairie Creek
- Roads
- Land Use Control Boundary
- Bridges
- Former Storage Tank Location
- Buildings
- Site Boundaries

Perchlorate Plume (µg/L)
- 17 - 100
- 100 - 1,000
- 1,000 - 10,000
- >10,000

Trichloroethene (TCE) Plume (µg/L)
- 5 - 10
- 10 - 100
- 100 - 1,000
- >1,000

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
4. ISB = in situ bioremediation
DPT = direct push technology
5. LUC boundary established in the 2016 Final Remedial Action Completion Report, LHAAP-50, Former Sump Water Tank (AECOM 2016)

0 75 150
Feet

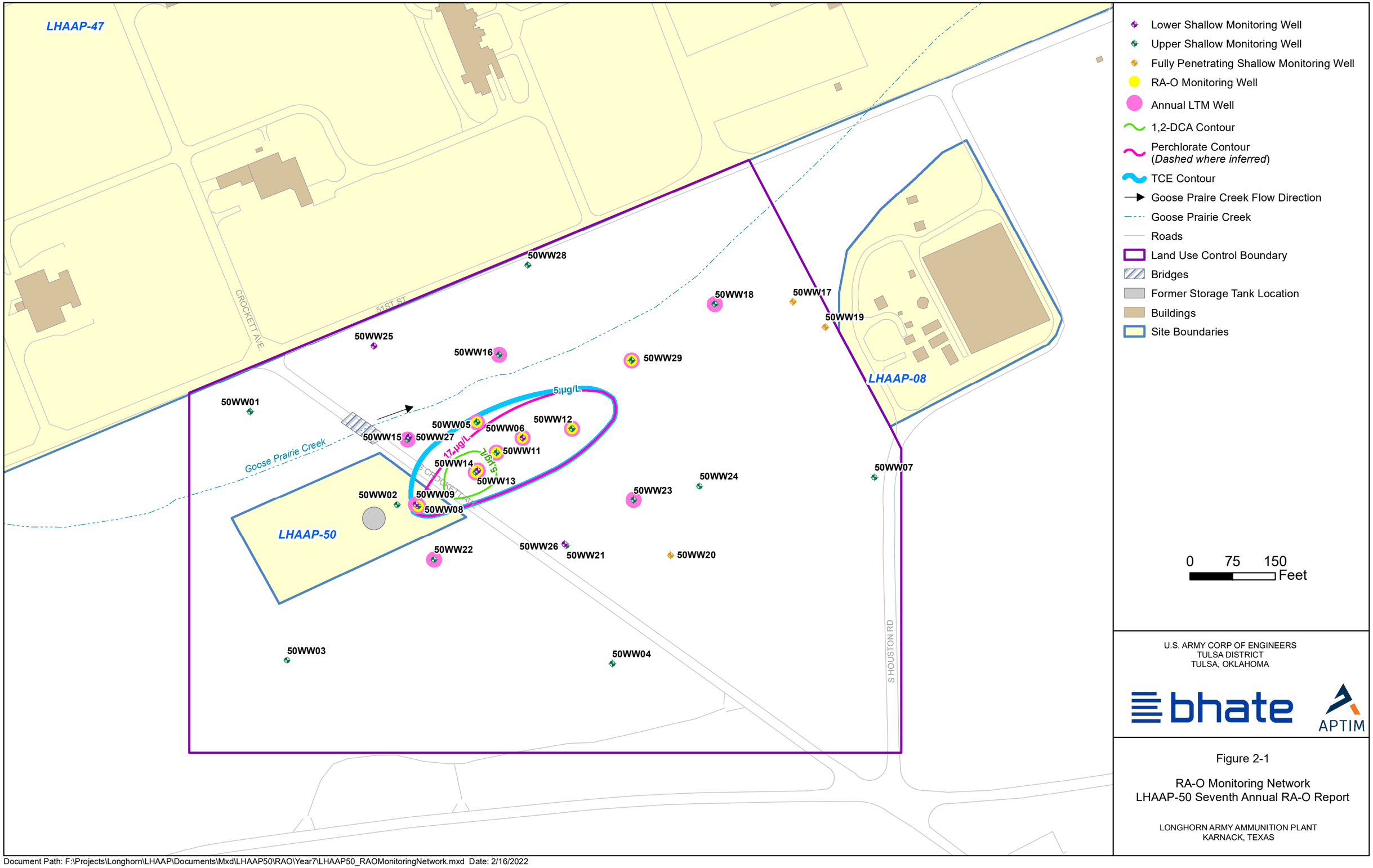
U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

bhate APTIM

Figure 1-4

TCE and Perchlorate Plumes
Baseline
LHAAP-50 Seventh Annual RA-O Report
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP50\RAO\Year7\LHAAP50_BaselineSamplingResults.mxd Date: 2/17/2022



U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

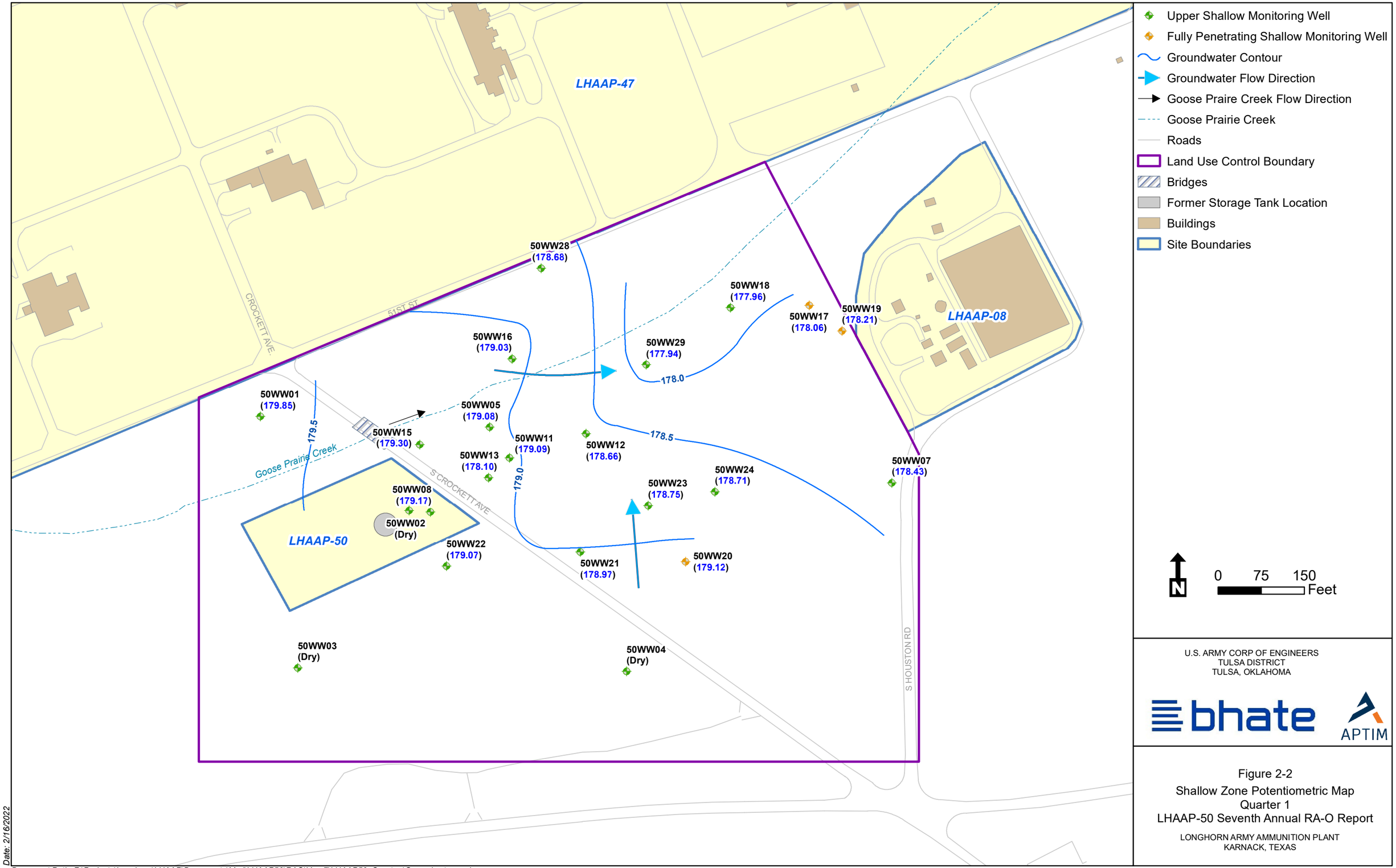
bhate APTIM

Figure 2-1

RA-O Monitoring Network
LHAAP-50 Seventh Annual RA-O Report

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP50\RAO\Year7\LHAAP50_RAOMonitoringNetwork.mxd Date: 2/16/2022



U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

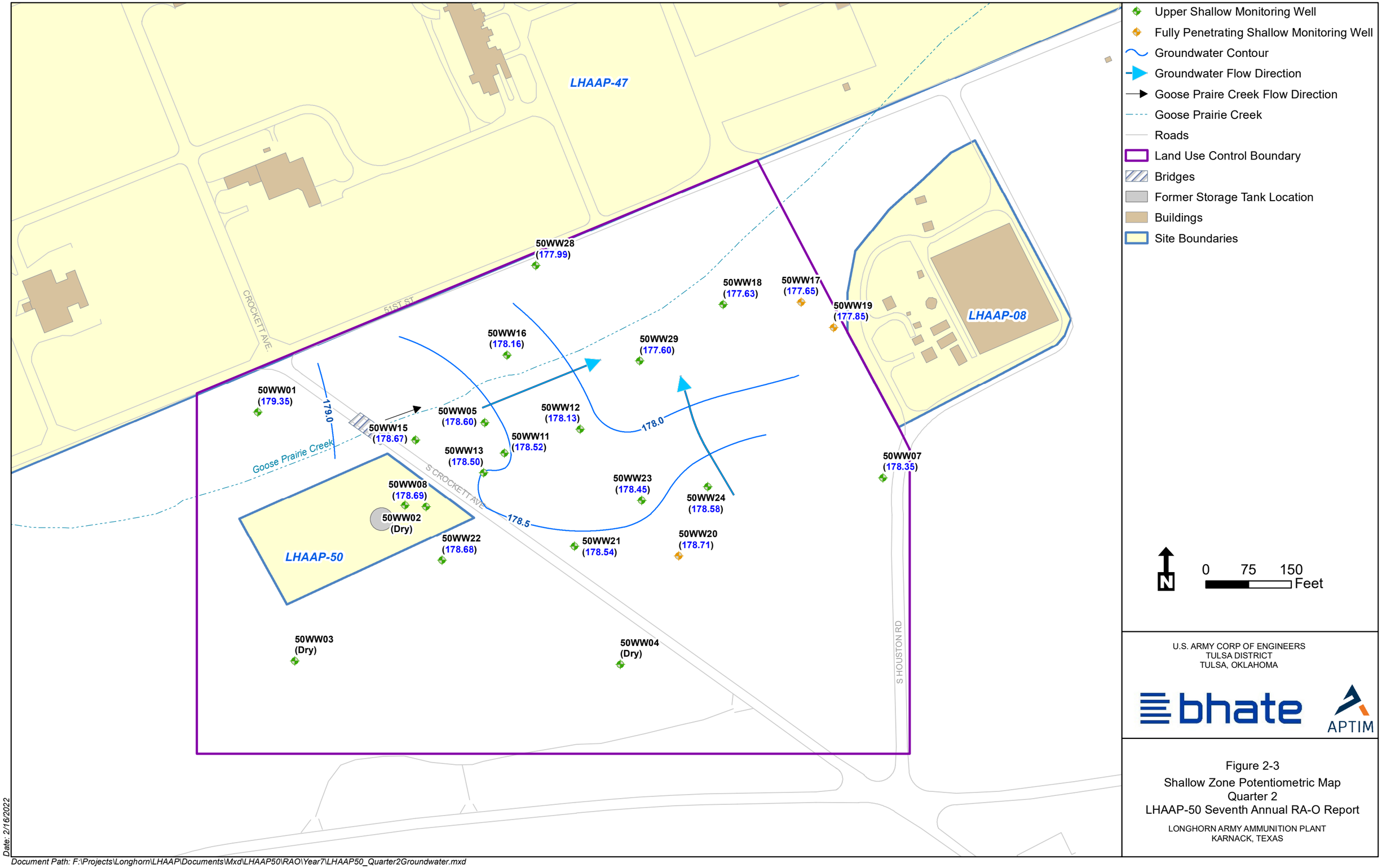
bhate APTIM

Figure 2-2
Shallow Zone Potentiometric Map
Quarter 1
LHAAP-50 Seventh Annual RA-O Report

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 2/16/2022

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP50\RAO\Year7\LHAAP50_Quarter1Groundwater.mxd



U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

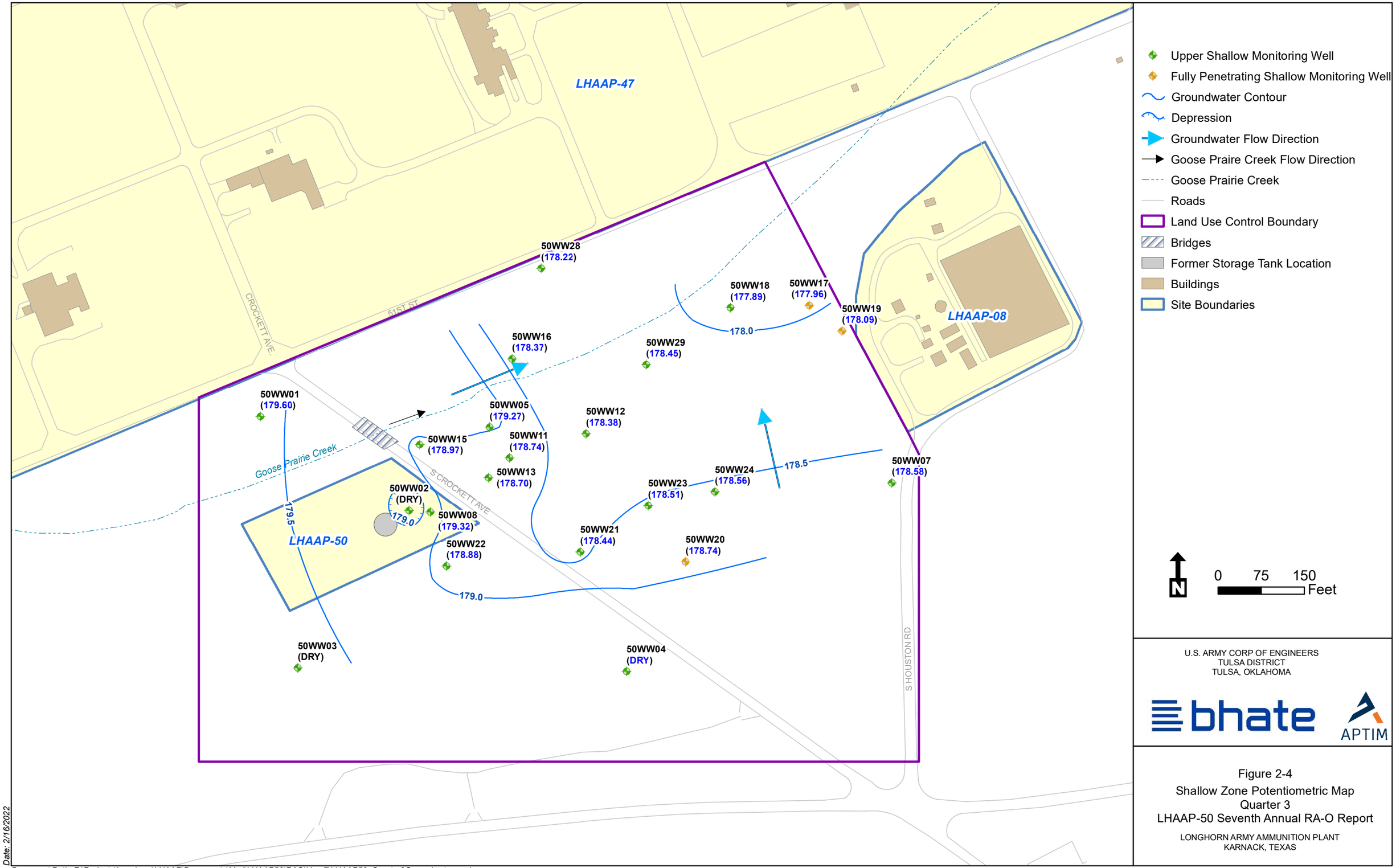
bhate APTIM

Figure 2-3
Shallow Zone Potentiometric Map
Quarter 2
LHAAP-50 Seventh Annual RA-O Report

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 2/16/2022

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP50\RAO\Year7\LHAAP50_Quarter2Groundwater.mxd



U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

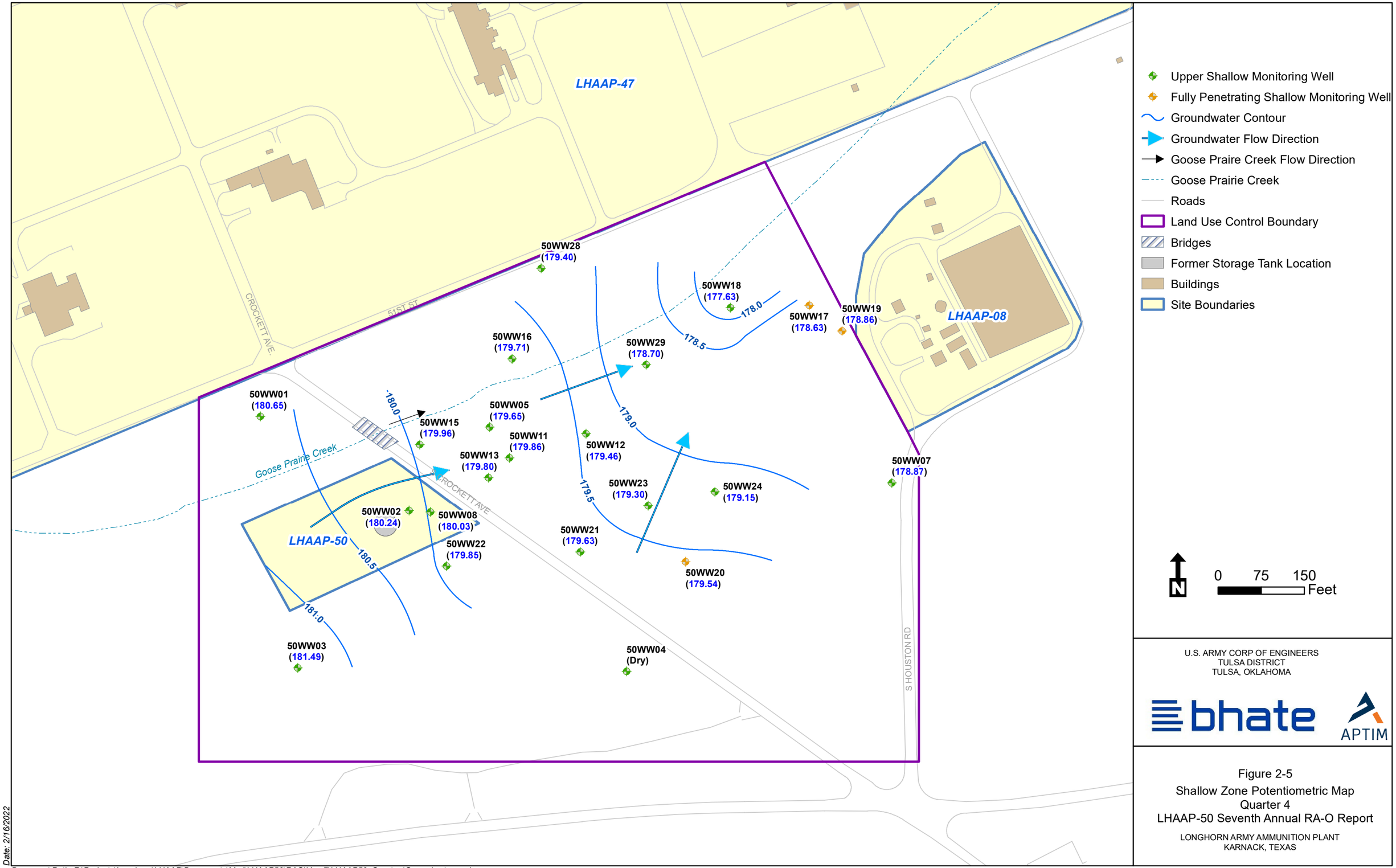
bhate APTIM

Figure 2-4
Shallow Zone Potentiometric Map
Quarter 3
LHAAP-50 Seventh Annual RA-O Report

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 2/16/2022

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP50\RAO\Year7\LHAAP50_Quarter3Groundwater.mxd



U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

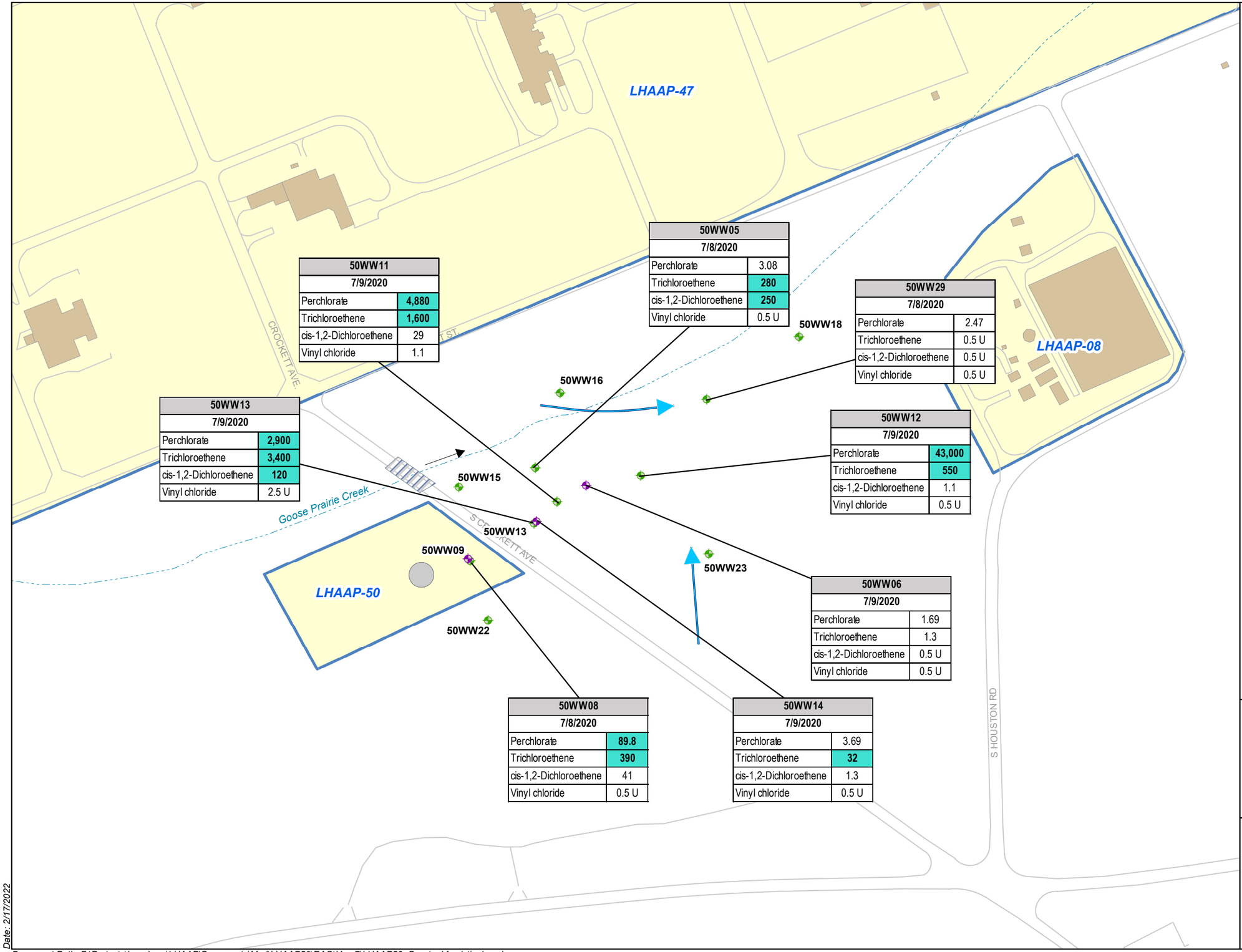
bhate APTIM

Figure 2-5
Shallow Zone Potentiometric Map
Quarter 4
LHAAP-50 Seventh Annual RA-O Report

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 2/16/2022

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP50\RAO\Year7\LHAAP50_Quarter4Groundwater.mxd



U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

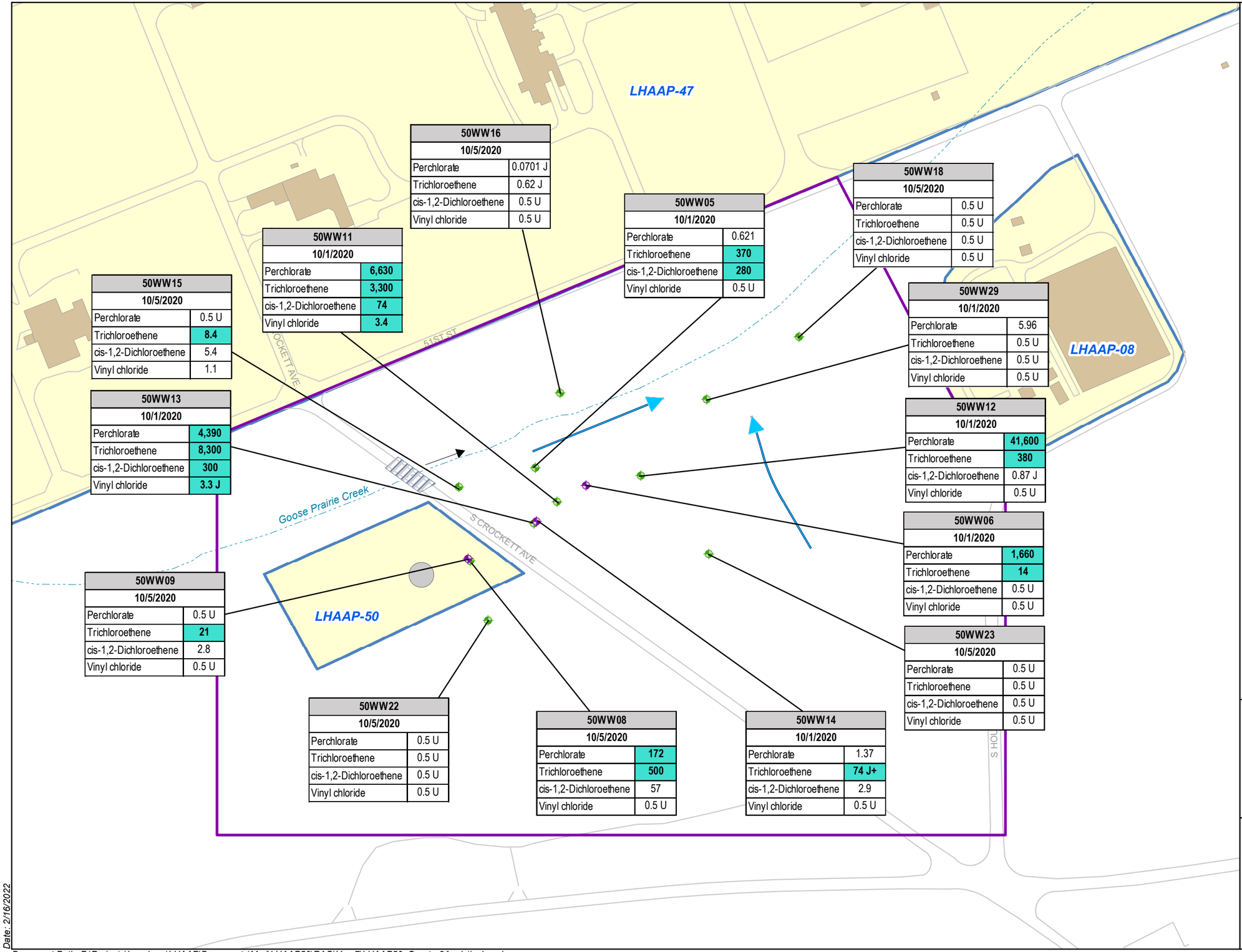
bhate APTIM

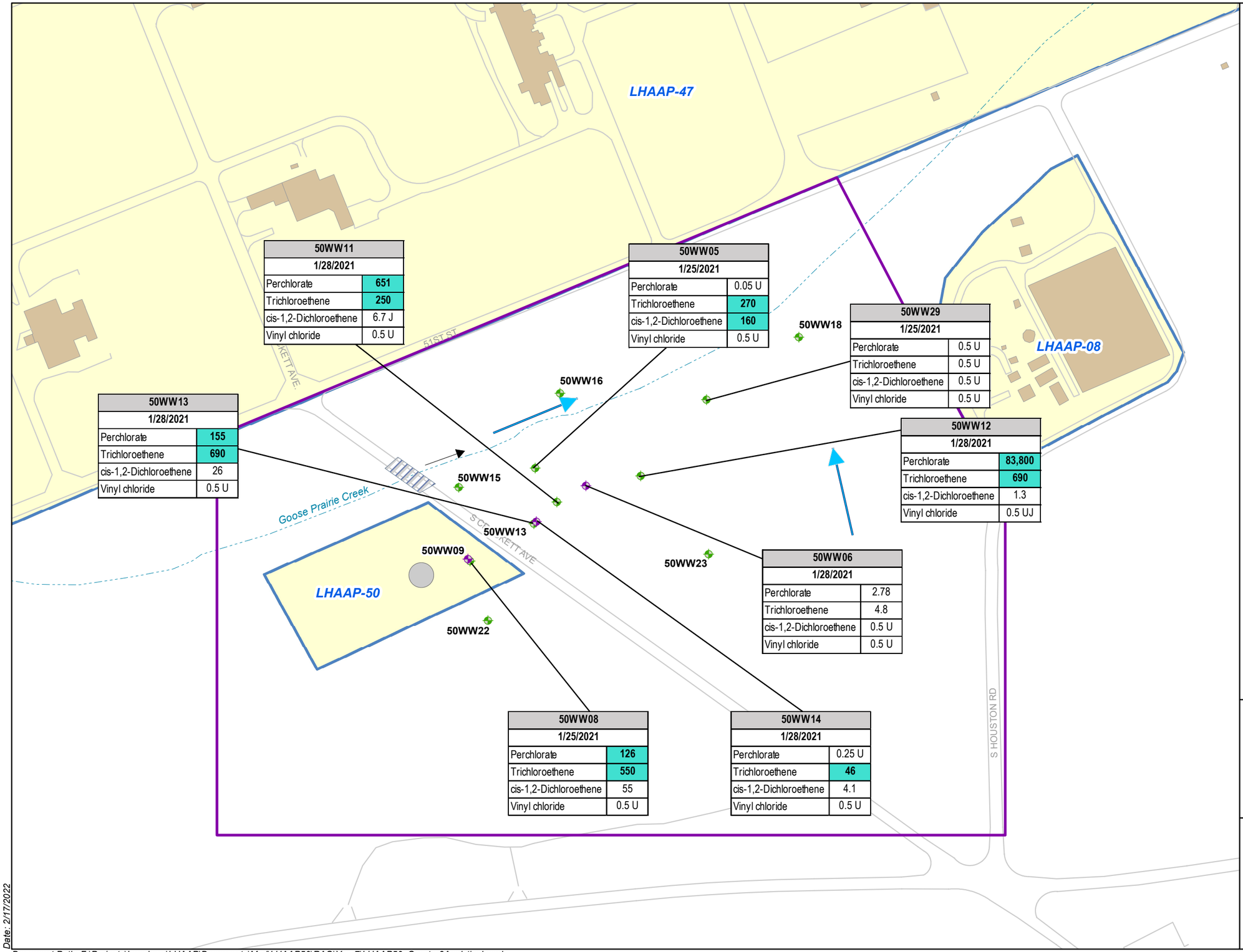
Figure 2-6
COC Concentrations in Groundwater
Quarter 1
LHAAP-50 Seventh Annual RA-O Report

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 2/17/2022

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP50\RAO\Year7\LHAAP50_Quarter1Analytical.mxd


LHAAP-47
LHAAP-08
LHAAP-50
Goose Prairie Creek
51ST ST
S CROCKETT AVE
S HOUSTON ST
50WW16
10/5/2020
Perchlorate 0.0701 J
Trichloroethene 0.62 J
cis-1,2-Dichloroethene 0.5 U
Vinyl chloride 0.5 U
50WW11
10/1/2020
Perchlorate 6,630
Trichloroethene 3,300
cis-1,2-Dichloroethene 74
Vinyl chloride 3.4
50WW15
10/5/2020
Perchlorate 0.5 U
Trichloroethene 8.4
cis-1,2-Dichloroethene 5.4
Vinyl chloride 1.1
50WW13
10/1/2020
Perchlorate 4,390
Trichloroethene 8,300
cis-1,2-Dichloroethene 300
Vinyl chloride 3.3 J
50WW05
10/1/2020
Perchlorate 0.621
Trichloroethene 370
cis-1,2-Dichloroethene 280
Vinyl chloride 0.5 U
50WW18
10/5/2020
Perchlorate 0.5 U
Trichloroethene 0.5 U
cis-1,2-Dichloroethene 0.5 U
Vinyl chloride 0.5 U
50WW29
10/1/2020
Perchlorate 5.96
Trichloroethene 0.5 U
cis-1,2-Dichloroethene 0.5 U
Vinyl chloride 0.5 U
50WW12
10/1/2020
Perchlorate 41,600
Trichloroethene 380
cis-1,2-Dichloroethene 0.87 J
Vinyl chloride 0.5 U
50WW06
10/1/2020
Perchlorate 1,660
Trichloroethene 14
cis-1,2-Dichloroethene 0.5 U
Vinyl chloride 0.5 U
50WW23
10/5/2020
Perchlorate 0.5 U
Trichloroethene 0.5 U
cis-1,2-Dichloroethene 0.5 U
Vinyl chloride 0.5 U
50WW09
10/5/2020
Perchlorate 0.5 U
Trichloroethene 21
cis-1,2-Dichloroethene 2.8
Vinyl chloride 0.5 U
50WW22
10/5/2020
Perchlorate 0.5 U
Trichloroethene 0.5 U
cis-1,2-Dichloroethene 0.5 U
Vinyl chloride 0.5 U
50WW08
10/5/2020
Perchlorate 172
Trichloroethene 500
cis-1,2-Dichloroethene 57
Vinyl chloride 0.5 U
50WW14
10/1/2020
Perchlorate 1.37
Trichloroethene 74 J+
cis-1,2-Dichloroethene 2.9
Vinyl chloride 0.5 U
Lower Shallow Monitoring Well
Upper Shallow Monitoring Well
Groundwater Flow Direction
Goose Praire Creek Flow Direction
Goose Prairie Creek
Roads
Land Use Control Boundary
Bridges
Former Storage Tank Location
Buildings
Site Boundaries
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.
J+ - The analyte was positively identified; the associated numerical value is its approximate concentration in the sample, with a high bias.
U - Undetected: The analyte was analyzed for, but not detected.
N
0 75 150
Feet
U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA
bhate
APTIM
Figure 2-7
COC Concentrations in Groundwater
Quarter 2
LHAAP-50 Seventh Annual RA-O Report
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
Date: 2/16/2022
Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP50\RAO\Year7\LHAAP50_Quarter2Analytical.mxd



- Lower Shallow Monitoring Well
- Upper Shallow Monitoring Well
- Groundwater Flow Direction
- Goose Praire Creek Flow Direction
- Goose Prairie Creek
- Roads
- Land Use Control Boundary
- Bridges
- Former Storage Tank Location
- Buildings
- Site Boundaries

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.
UJ - Undetected estimated: The analyte was analyzed for, but was not detected. Even though the analyte was not detected, certain discrepancies in meeting analyte specific quality control were not met.
U - Undetected: The analyte was analyzed for, but not detected.

N

0 75 150 Feet

U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

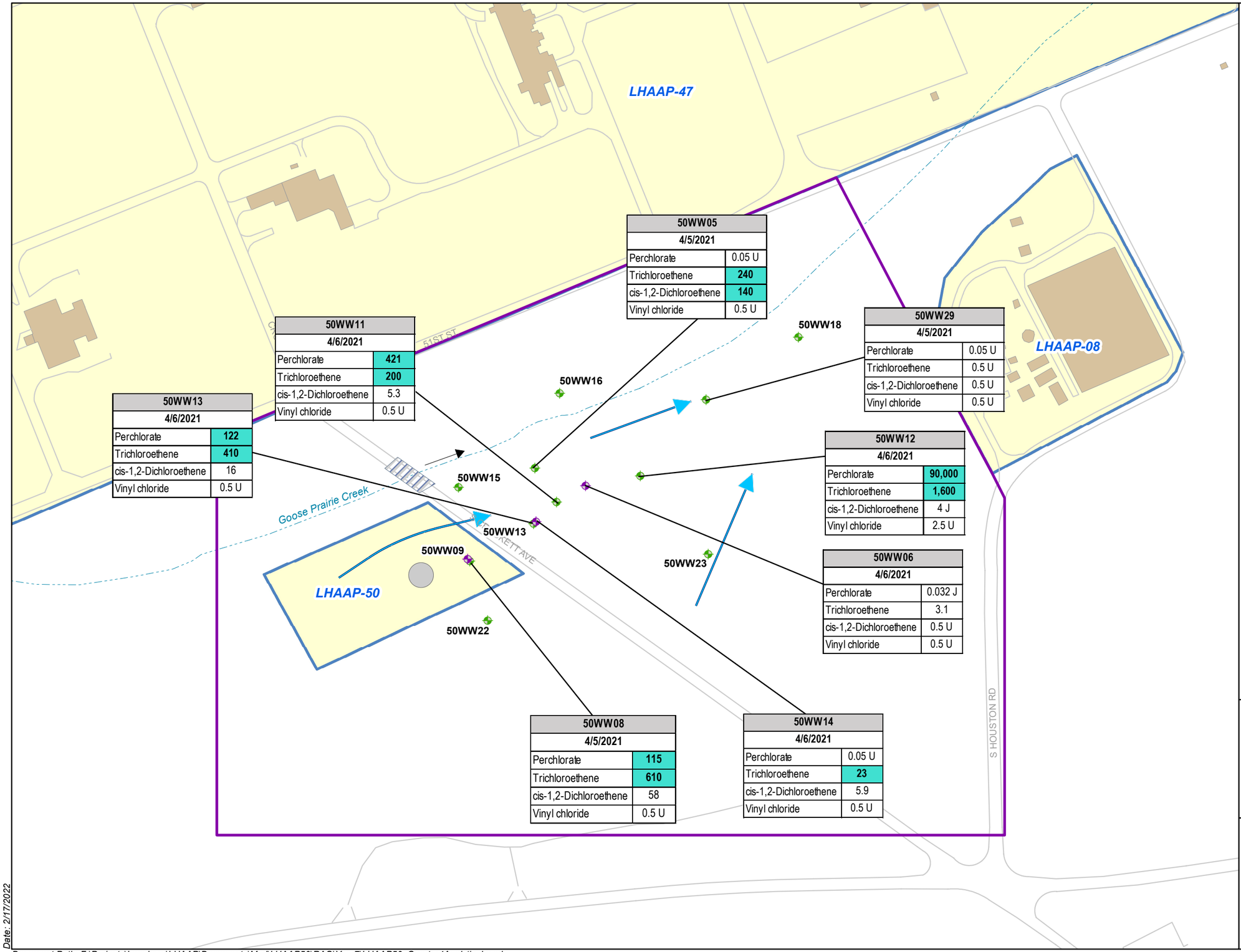
bhate APTIM

Figure 2-8
COC Concentrations in Groundwater
Quarter 3
LHAAP-50 Seventh Annual RA-O Report

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 2/17/2022

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP50\RAO\Year7\LHAAP50_Quarter3Analytical.mxd



- Lower Shallow Monitoring Well
- Upper Shallow Monitoring Well
- Groundwater Flow Direction
- Goose Praire Creek Flow Direction
- Goose Prairie Creek
- Roads
- Land Use Control Boundary
- Bridges
- Former Storage Tank Location
- Buildings
- Site Boundaries

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.

N

0 75 150 Feet

U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

bhate APTIM

Figure 2-9
COC Concentrations in Groundwater
Quarter 4
LHAAP-50 Seventh Annual RA-O Report

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 2/17/2022

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP50\RAO\Year7\LHAAP50_Quarter4Analytical.mxd

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.
J+ - The analyte was positively identified; the associated numerical value is its approximate concentration in the sample, with a high bias.
U - Undetected: The analyte was analyzed for, but not detected.
3. µg/L = micrograms per liter
4. ISB = in situ bioremediation
DPT = direct push technology
5. LUC boundary established in the 2016 Final Remedial Action Completion Report, LHAAP-50, Former Sump Water Tank (AECOM 2016)

LHAAP-47
LHAAP-08
LHAAP-50
CROCKETT AVE.
51ST ST.
Goose Prairie Creek
S HOUSTON RD

50WW18
0.5 U
0.5 U

50WW16
0.0701 J
0.62 J

50WW06
1660
14

50WW05
0.621
370

50WW29
5.96
0.5 U

50WW12
41600
380

50WW15
0.5 U
8.4

50WW09
0.5 U
21

50WW08
172
500

50WW13
4390
8300

50WW14
1.37
74 J+

50WW22
0.5 U
0.5 U

50WW23
0.5 U
0.5 U

50WW11
6630
3300

- Lower Shallow Monitoring Well
- Upper Shallow Monitoring Well
- ISB DPT Point
- Groundwater Flow Direction
- Goose Praire Creek Flow Direction
- Goose Prairie Creek
- Roads
- Land Use Control Boundary
- Bridges
- Former Storage Tank Location
- Buildings
- Site Boundaries

Perchlorate Plume (µg/L)
- 17 - 100
- 100 - 1,000
- 1,000 - 10,000
- >10,000

Trichloroethene (TCE) Plume (µg/L)
- 5 - 10
- 10 - 100
- 100 - 1,000
- >1,000

N
0 75 150
Feet

U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

bhate APTIM

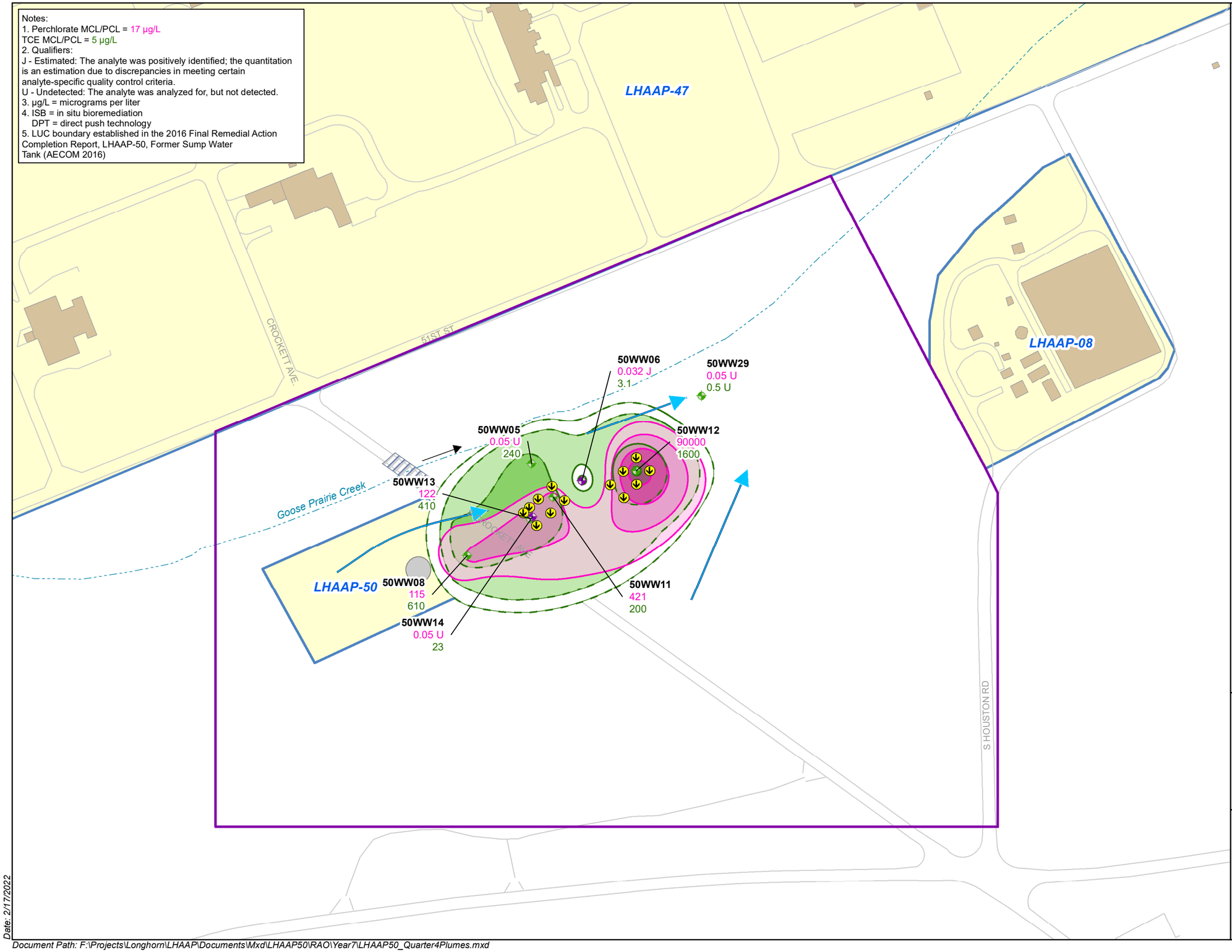
Figure 2-10
TCE and Perchlorate Plumes
Quarter 2
LHAAP-50 Seventh Annual RA-O Report

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 2/17/2022

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP50\RAO\Year7\LHAAP50_Quarter2Plumes.mxd

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
4. ISB = in situ bioremediation
DPT = direct push technology
5. LUC boundary established in the 2016 Final Remedial Action Completion Report, LHAAP-50, Former Sump Water Tank (AECOM 2016)



- Lower Shallow Monitoring Well
- Upper Shallow Monitoring Well
- ISB DPT Point
- Groundwater Flow Direction
- Goose Praire Creek Flow Direction
- Goose Prairie Creek
- Roads
- Land Use Control Boundary
- Bridges
- Former Storage Tank Location
- Buildings
- Site Boundaries

Perchlorate Plume (µg/L)
- 17 - 100
- 100 - 1,000
- 1,000 - 10,000
- >10,000

Trichloroethene (TCE) Plume (µg/L)
- 5 - 10
- 10 - 100
- 100 - 1,000
- >1,000

N

0 75 150 Feet

U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

bhate APTIM

Figure 2-11
TCE and Perchlorate Plumes
Quarter 4
LHAAP-50 Seventh Annual RA-O Report

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 2/17/2022

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP50\RAO\Year7\LHAAP50_Quarter4Plumes.mxd

Figure 3-1a: 50WW05 (upper shallow)

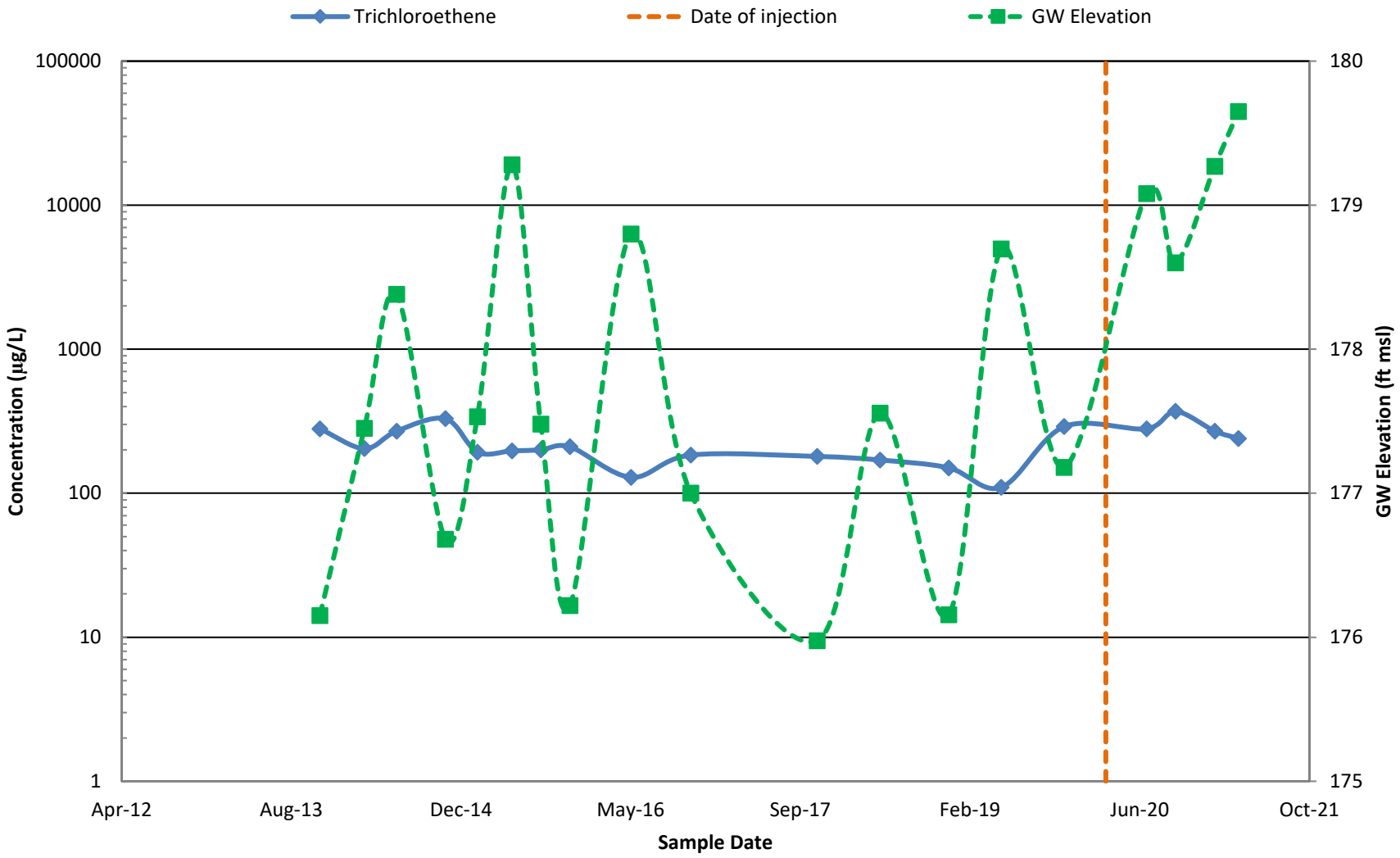


Figure 3-1b: 50WW06 (lower shallow)

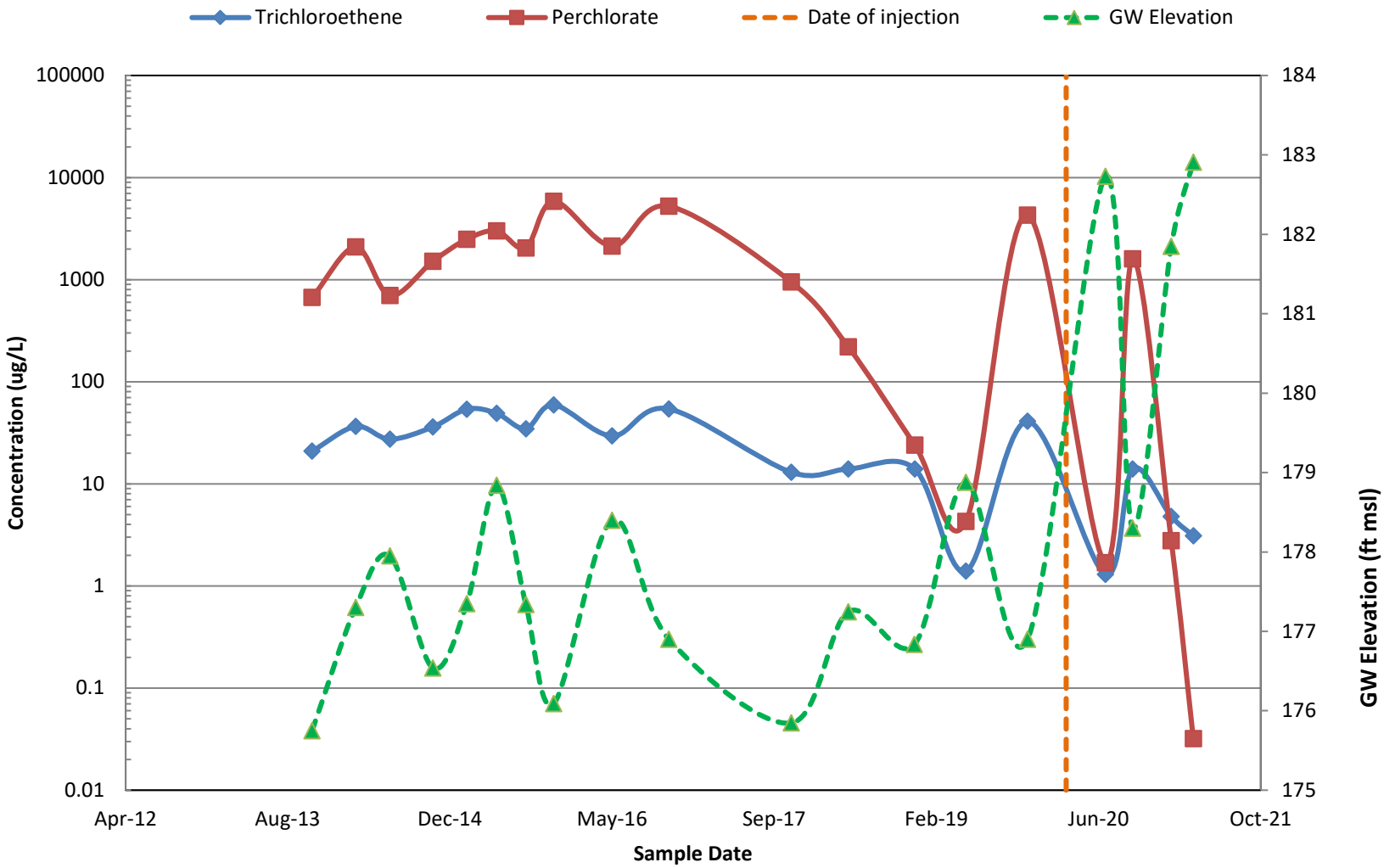


Figure 3-1c: 50WW08 (upper shallow)

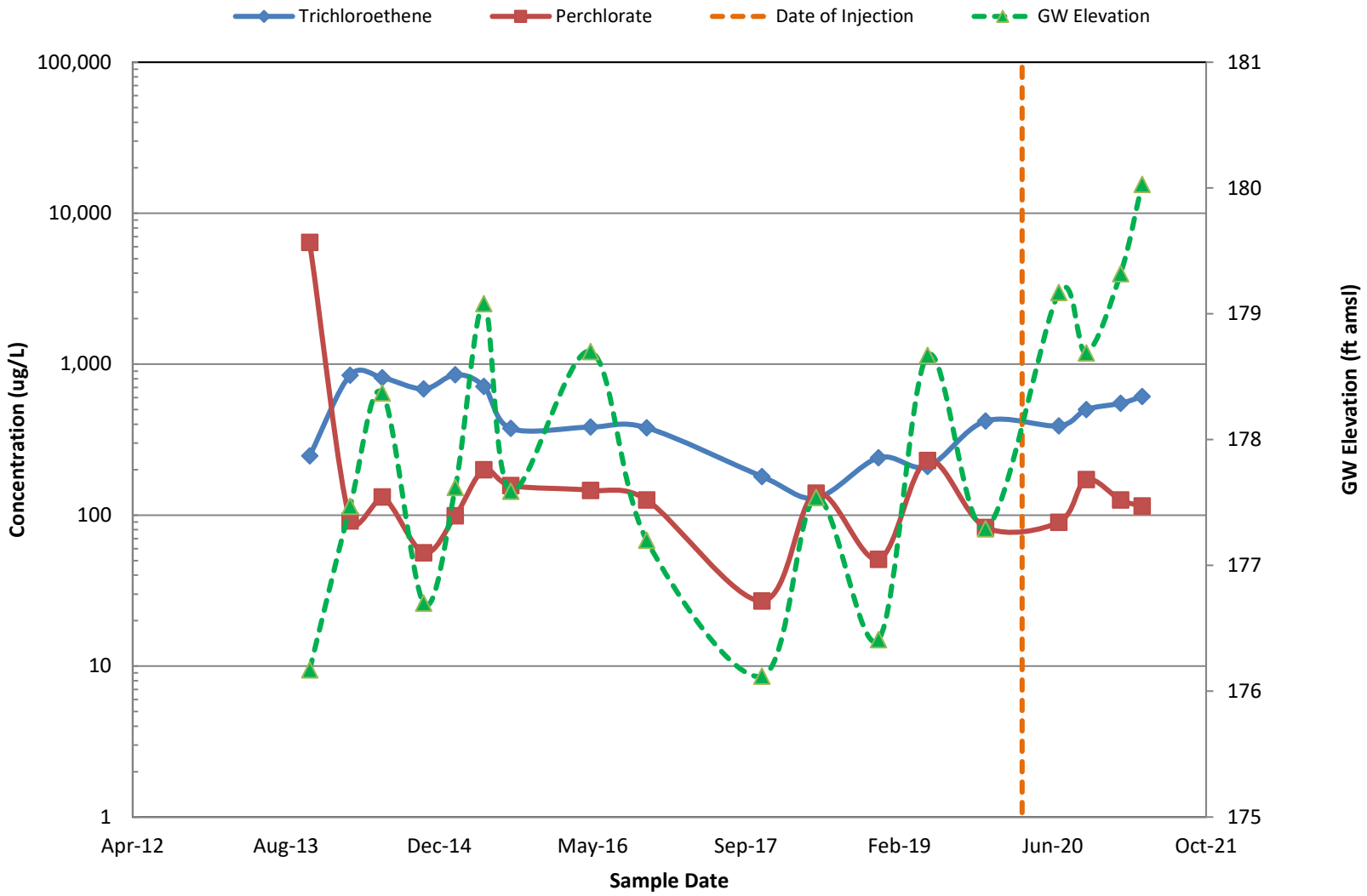


Figure 3-1d: 50WW09 (lower shallow)

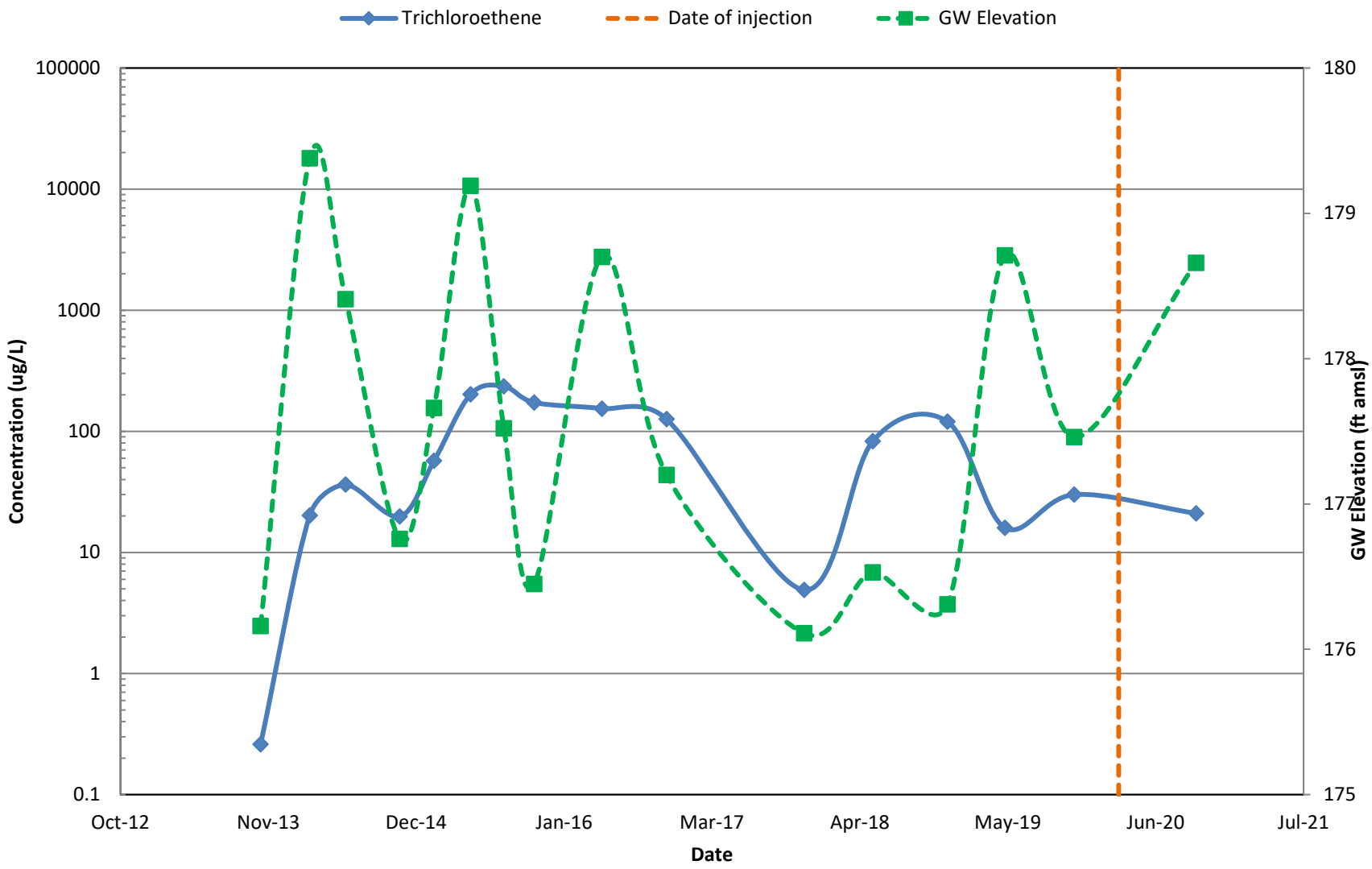


Figure 3-1e: 50WW11 (upper shallow)

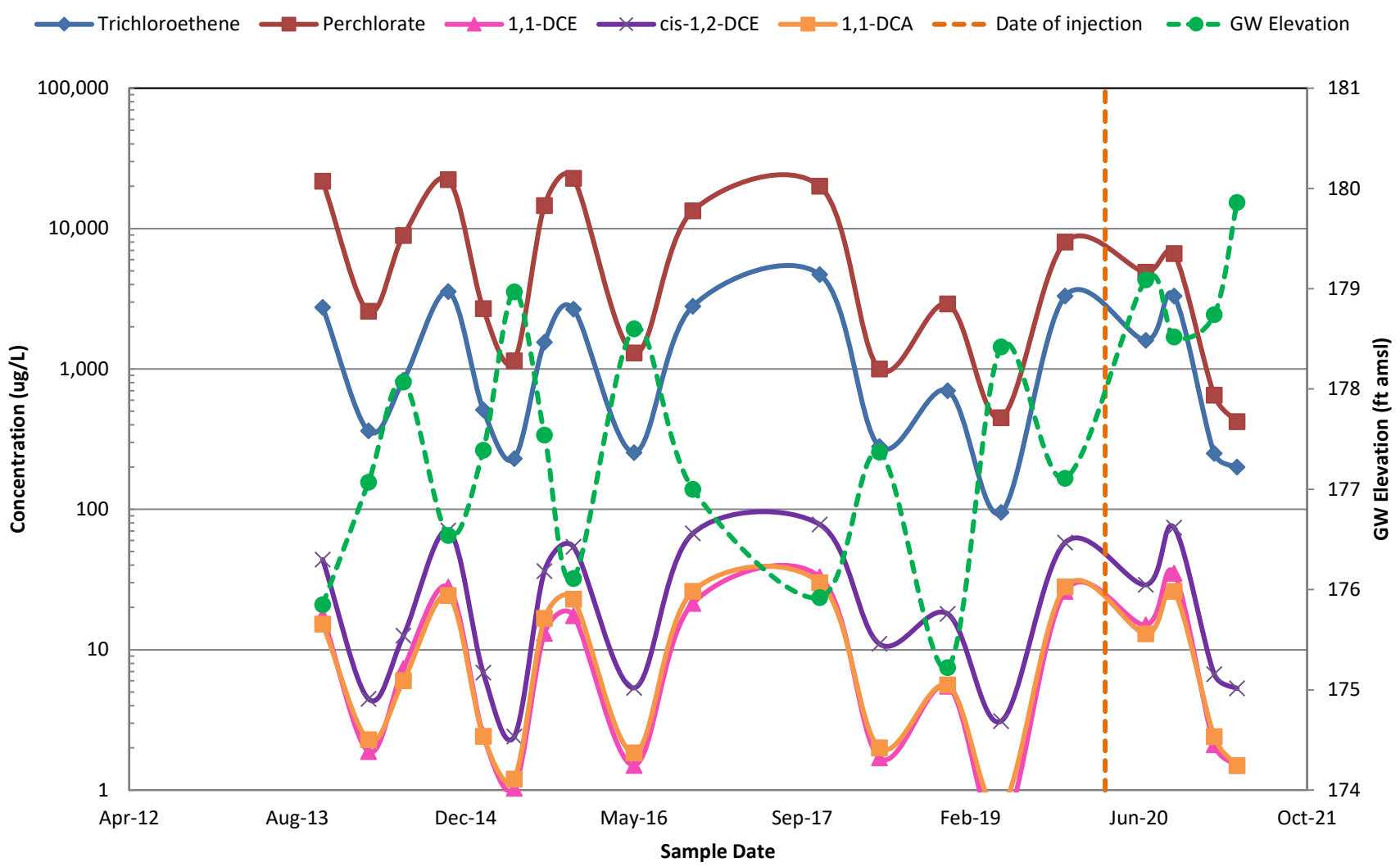


Figure 3-1f: 50WW12 (upper shallow)

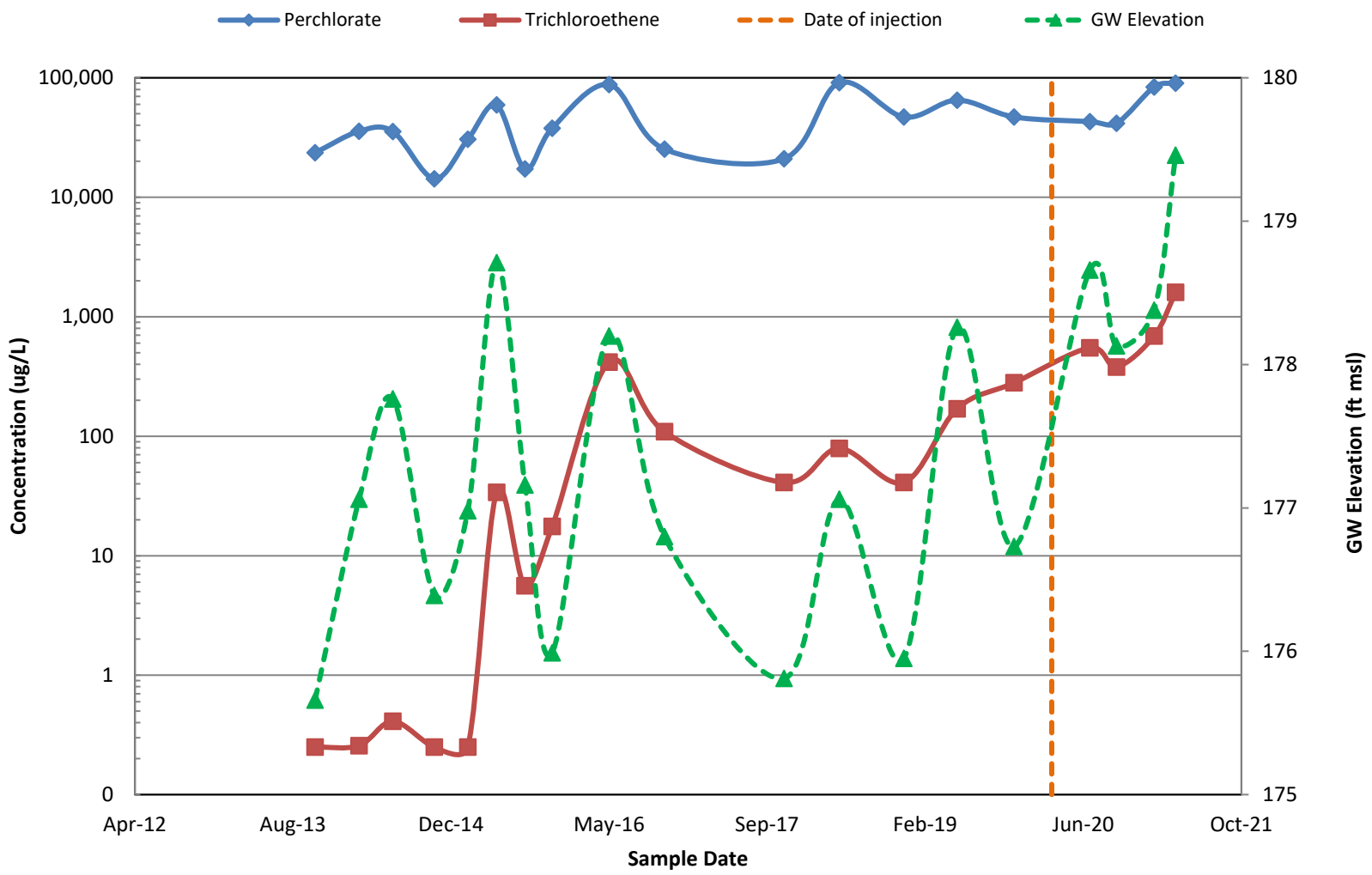


Figure 3-1g: 50WW13 (upper shallow)

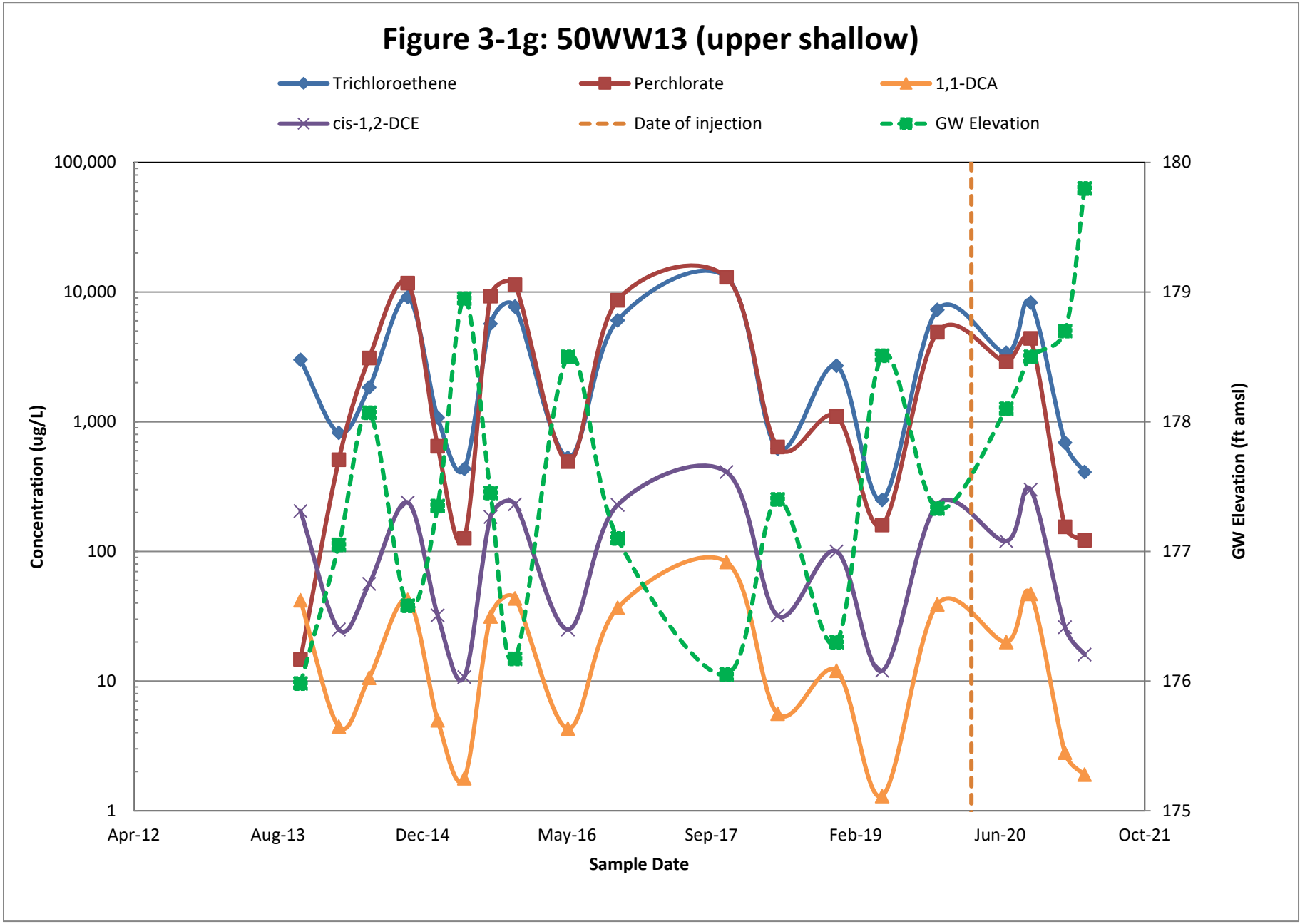


Figure 3-1h: 50WW14 (lower shallow)

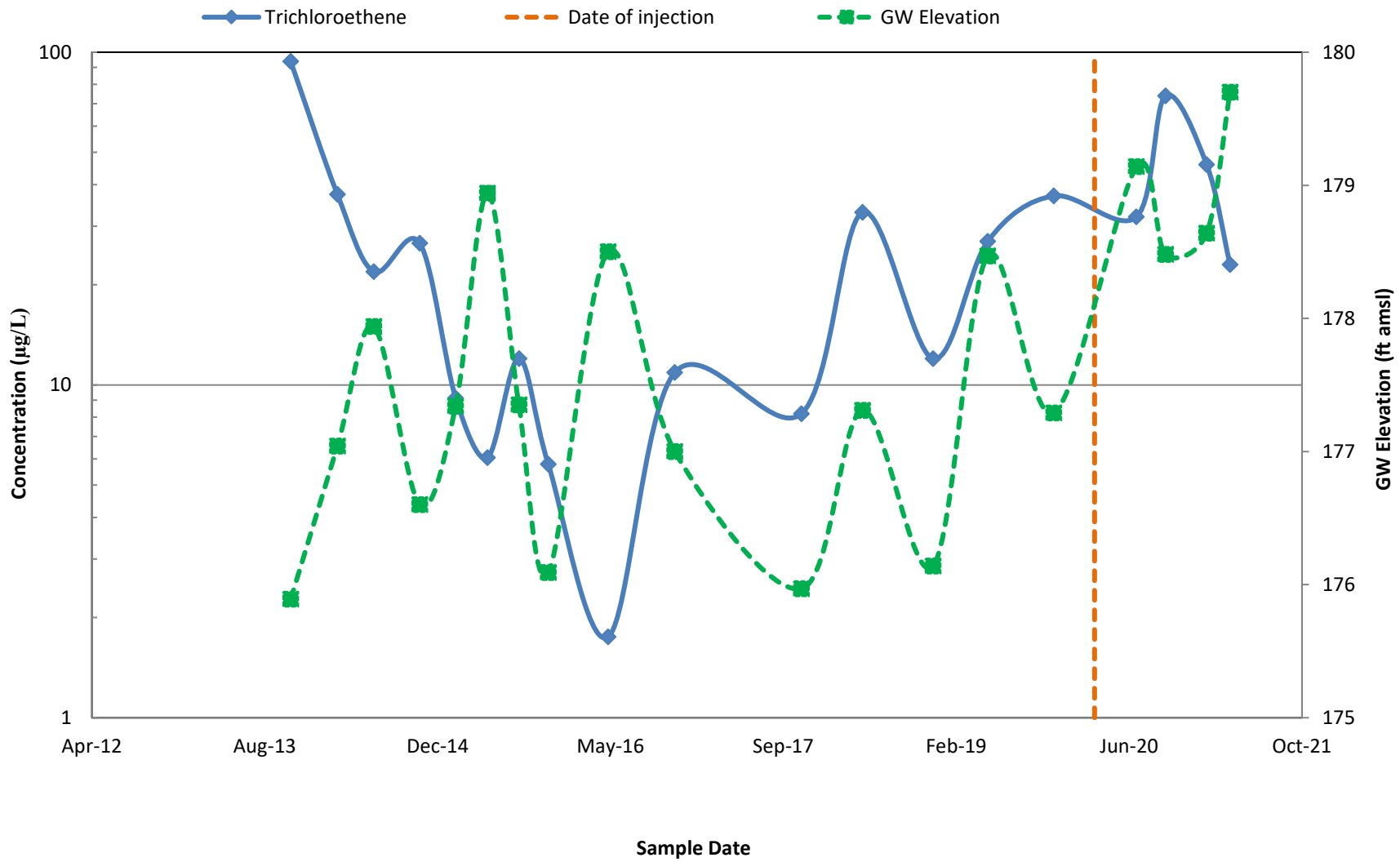
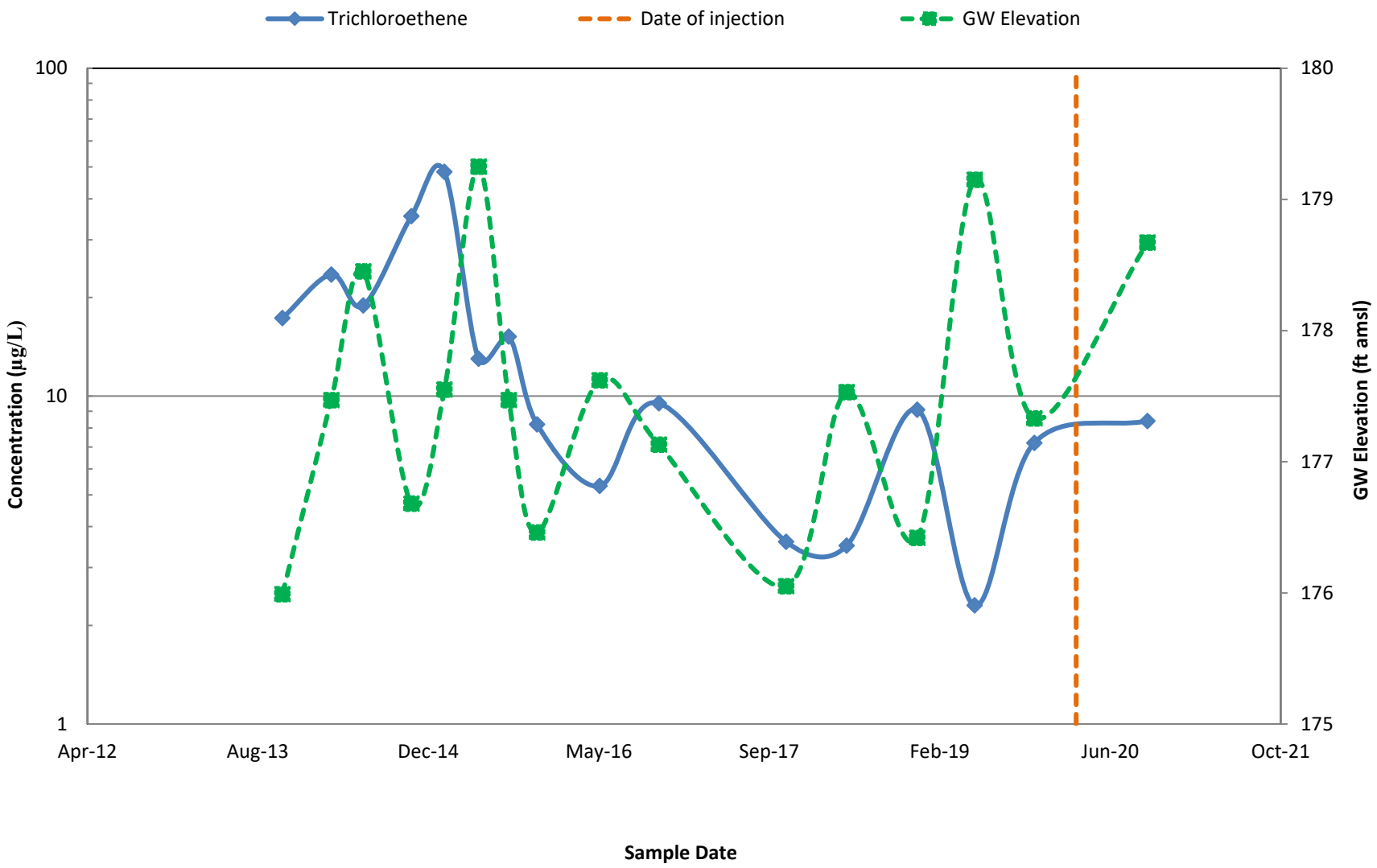


Figure 3-1i: 50WW15 (lower shallow)



Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • March 2022

Appendix A

Annual Land-Use Control Compliance Certification and Documentation

Sample Annual Land Use Control Compliance Certification Documentation

In accordance with the Remedial Design dated _____ for LHAAP-50 a certification of site was conducted by ____APTim____ [indicate transferee] on ____9/15/20____.

A summary of land use control mechanisms is as follows:

- Groundwater restriction - restriction of the use of groundwater to environmental monitoring and testing until cleanup levels are met. The restriction against residential use of groundwater will remain in effect until the levels of the COCs in groundwater allow unrestricted use and unlimited exposure (UUUE). [Indicate whether groundwater restrictions are still required at LHAAP-50]

A summary of compliance with land use and restriction covenants is as follows:

- No use of groundwater, installation of new groundwater wells, or tampering with existing wells at LHAAP-50.

I, the undersigned, do document that the certification was performed as indicated above, and that the above information is true and correct to the best of my knowledge, information, and belief.

Date: SEPTEMBER 15, 2020

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.

Appendix B

Photographic Log and Well Inspection Forms

APPENDIX B

July 2020 Photo Log

Photo No.	Date	Task and Description
1	7/9/2020	View of Monitoring Well 50WW01
2	7/8/2020	View of Monitoring Well 50WW02
3	7/8/2020	View of Monitoring Well 50WW03
4	7/8/2020	View of Monitoring Well 50WW04
5	7/8/2020	View of Monitoring Well 50WW05
6	7/9/2020	View of Monitoring Well 50WW06
7	7/9/2020	View of Monitoring Well 50WW07
8	7/8/2020	View of Monitoring Well 50WW08
9	7/8/2020	View of Monitoring Well 50WW09
10	7/8/2020	View of Monitoring Well 50WW10
11	7/9/2020	View of Monitoring Well 50WW11
12	7/9/2020	View of Monitoring Well 50WW12
13	7/9/2020	View of Monitoring Well 50WW13
14	7/9/2020	View of Monitoring Well 50WW14
15	7/8/2020	View of Monitoring Well 50WW15
16	7/9/2020	View of Monitoring Well 50WW16
17	7/9/2020	View of Monitoring Well 50WW17
18	7/9/2020	View of Monitoring Well 50WW18
19	7/9/2020	View of Monitoring Well 50WW19
20	7/8/2020	View of Monitoring Well 50WW20
21	7/8/2020	View of Monitoring Well 50WW21
22	7/8/2020	View of Monitoring Well 50WW22
23	7/8/2020	View of Monitoring Well 50WW23

Photo No.	Date	Task and Description
24	7/8/2020	View of Monitoring Well 50WW24
25	7/9/2020	View of Monitoring Well 50WW25
26	7/8/2020	View of Monitoring Well 50WW26
27	7/8/2020	View of Monitoring Well 50WW27
28	7/9/2020	View of Monitoring Well 50WW28
29	7/8/2020	View of Monitoring Well 50WW29

PHOTO 1: View of Monitoring Well 50WW01
DATE: July 9, 2020

PHOTO 2: View of Monitoring Well 50WW02
DATE: July 8, 2020

PHOTO 3: View of Monitoring Well 50WW03
DATE: July 8, 2020

PHOTO 4: View of Monitoring Well 50WW04
DATE: July 8, 2020

PHOTO 5: View of Monitoring Well 50WW05
DATE: July 8, 2020

PHOTO 6: View of Monitoring Well 50WW06
DATE: July 9, 2020

PHOTO 7: View of Monitoring Well 50WW07
DATE: July 9, 2020

PHOTO 8: View of Monitoring Well 50WW08
DATE: July 8, 2020

PHOTO 9: View of Monitoring Well 50WW09
DATE: July 8, 2020

PHOTO 10: View of Monitoring Well 50WW10
DATE: July 8, 2020

PHOTO 11: View of Monitoring Well 50WW11
DATE: July 9, 2020

PHOTO 12: View of Monitoring Well 50WW12
DATE: July 9, 2020

PHOTO 13: View of Monitoring Well 50WW13
DATE: July 9, 2020

PHOTO 14: View of Monitoring Well 50WW14
DATE: July 9, 2020

PHOTO 15: View of Monitoring Well 50WW15
DATE: July 8, 2020

PHOTO 16: View of Monitoring Well 50WW16
DATE: July 9, 2020

PHOTO 17: View of Monitoring Well 50WW17
DATE: July 9, 2020

PHOTO 18: View of Monitoring Well 50WW18
DATE: July 9, 2020

PHOTO 19: View of Monitoring Well 50WW19
DATE: July 9, 2020

PHOTO 20: View of Monitoring Well 50WW20
DATE: July 8, 2020

PHOTO 21: View of Monitoring Well 50WW21
DATE: July 8, 2020

PHOTO 22: View of Monitoring Well 50WW22
DATE: July 8, 2020

PHOTO 23: View of Monitoring Well 50WW23
DATE: July 8, 2020

PHOTO 24: View of Monitoring Well 50WW24
DATE: July 8, 2020

PHOTO 25: View of Monitoring Well 50WW25
DATE: July 9, 2020

PHOTO 26: View of Monitoring Well 50WW26
DATE: July 8, 2020

PHOTO 27: View of Monitoring Well 50WW27
DATE: July 8, 2020

PHOTO 28: View of Monitoring Well 50WW28
DATE: July 9, 2020

PHOTO 29: View of Monitoring Well 50WW29
DATE: July 8, 2020

01077363

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW02
Inspection Date: 7/8/20
Well Completion Depth/ Measured Depth: 22.37
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077364

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: SO

Well ID: SOWW18
Inspection Date: 7/9/20
Well Completion Depth/ Measured Depth:
Inspector: Scott Breisgar

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077365

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW17
Inspection Date: 7/9/20
Well Completion Depth/ Measured Depth: 64.63
Inspector: Scott Bassinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077366

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARmy
Site Name: 50

Well ID: 50WW19
Inspection Date: 7/9/20
Well Completion Depth/ Measured Depth: 64.90
Inspector: Scott Baginski

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077367

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50WW07
Inspection Date: 7/9/20
Well Completion Depth/ Measured Depth: 31.81
Inspector: Scott Baggingar

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

FLUSH MOUNTED NA
Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches) 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077368

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50

Well ID: 50WW28
Inspection Date: 7/9/20
Well Completion Depth/ Measured Depth: 27.10
Inspector: Scott Bessinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077369

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW25
Inspection Date: 7/9/20
Well Completion Depth/ Measured Depth: 57.81
Inspector: Scott Baesinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077370

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50

Well ID: 50WW16
Inspection Date: 7/9/20
Well Completion Depth/ Measured Depth: 37.90
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077371

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50

Well ID: 50WW01
Inspection Date: 7/9/20
Well Completion Depth/ Measured Depth: 23.25
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077372

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW12
Inspection Date: 7/9/20
Well Completion Depth/ Measured Depth: 37.92
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: metal
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077373

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50MW06
Inspection Date: 7/9/20
Well Completion Depth/ Measured Depth: 58.00
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077374

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARmy
Site Name: 50
Well ID: 50WW11
Inspection Date: 7/9/20
Well Completion Depth/ Measured Depth: 37.78
Inspector: Scott Bassinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077375

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW13
Inspection Date: 7/9/20
Well Completion Depth/ Measured Depth: 37.65
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2 11
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077376

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50MW14
Inspection Date: 7/9/20
Well Completion Depth/ Measured Depth: 60.70
Inspector: Scott Bessinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077377

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50 MW08
Inspection Date: 7/8/20
Well Completion Depth/ Measured Depth: 32.71
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2 11
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077378

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50WW29
Inspection Date: 7/8/20
Well Completion Depth/ Measured Depth: 37.90
Inspector: Scott Beusinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077379

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50MW05
Inspection Date: 7/8/20
Well Completion Depth/ Measured Depth: 25.35
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches) 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077380

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50

Well ID: 50WW27
Inspection Date: 7/8/20
Well Completion Depth/ Measured Depth: 59.95
Inspector: Scott Bassinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077381

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50

Well ID: 50MW26
Inspection Date: 7/8/20
Well Completion Depth/ Measured Depth: 62.80
Inspector: Scott Bessinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077382

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 50132
Client: ARMY
Site Name: 50

Well ID: 50MW24
Inspection Date: 7/8/20
Well Completion Depth/ Measured Depth: 38.02
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077383

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50

Well ID: 50WW23
Inspection Date: 7/8/20
Well Completion Depth/ Measured Depth: 37.82
Inspector: Scott Bessinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077384

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50

Well ID: 50WW22
Inspection Date: 7/8/20
Well Completion Depth/ Measured Depth: 37.82
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077385

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARmy
Site Name: SD

Well ID: SDWW21
Inspection Date: 7/8/20
Well Completion Depth/ Measured Depth: 37.67
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077386

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50MW20
Inspection Date: 7/8/20
Well Completion Depth/ Measured Depth: 57.80
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077387

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARmy
Site Name: 50

Well ID: 50WW15
Inspection Date: 7/8/20
Well Completion Depth/Measured Depth: 37.90
Inspector: Scott Baesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077388

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARmy
Site Name: 50
Well ID: 50WW10
Inspection Date: 7/8/20
Well Completion Depth/ Measured Depth: 111.25
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077389

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW09
Inspection Date: 7/8/20
Well Completion Depth/ Measured Depth: 62.42
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077390

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50WW04
Inspection Date: 9/8/20
Well Completion Depth/ Measured Depth: 23.20
Inspector: Scott Beesinger

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA
Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077391

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW03
Inspection Date: 7/8/20
Well Completion Depth/ Measured Depth: 23.20
Inspector: Scott Bessinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

APPENDIX B

October 2020 Photo Log

Photo No.	Date	Task and Description
1	10/6/2020	View of Monitoring Well 50WW01
2	10/6/2020	View of Monitoring Well 50WW02
3	10/6/2020	View of Monitoring Well 50WW03
4	10/6/2020	View of Monitoring Well 50WW04
5	10/1/2020	View of Monitoring Well 50WW05
6	10/1/2020	View of Monitoring Well 50WW06
7	10/6/2020	View of Monitoring Well 50WW07
8	10/5/2020	View of Monitoring Well 50WW08
9	10/5/2020	View of Monitoring Well 50WW09
10	10/6/2020	View of Monitoring Well 50WW10
11	10/1/2020	View of Monitoring Well 50WW11
12	10/1/2020	View of Monitoring Well 50WW12
13	10/1/2020	View of Monitoring Well 50WW13
14	10/1/2020	View of Monitoring Well 50WW14
15	10/5/2020	View of Monitoring Well 50WW15
16	10/5/2020	View of Monitoring Well 50WW16
17	10/6/2020	View of Monitoring Well 50WW17
18	10/5/2020	View of Monitoring Well 50WW18
19	10/6/2020	View of Monitoring Well 50WW19
20	10/6/2020	View of Monitoring Well 50WW20
21	10/6/2020	View of Monitoring Well 50WW21
22	10/5/2020	View of Monitoring Well 50WW22
23	10/5/2020	View of Monitoring Well 50WW23

Photo No.	Date	Task and Description
24	10/6/2020	View of Monitoring Well 50WW24
25	10/6/2020	View of Monitoring Well 50WW25
26	10/6/2020	View of Monitoring Well 50WW26
27	10/6/2020	View of Monitoring Well 50WW27
28	10/6/2020	View of Monitoring Well 50WW28
29	10/1/2020	View of Monitoring Well 50WW29

PHOTO 1: View of Monitoring Well 50WW01
DATE: October 6, 2020

PHOTO 2: View of Monitoring Well 50WW02
DATE: October 6, 2020

PHOTO 3: View of Monitoring Well 50WW03
DATE: October 6, 2020

PHOTO 4: View of Monitoring Well 50WW04
DATE: October 6, 2020

PHOTO 5: View of Monitoring Well 50WW05
DATE: October 1, 2020

PHOTO 6: View of Monitoring Well 50WW06
DATE: October 1, 2020

PHOTO 7: View of Monitoring Well 50WW07
DATE: October 6, 2020

PHOTO 8: View of Monitoring Well 50WW08
DATE: October 5, 2020

PHOTO 9: View of Monitoring Well 50WW09
DATE: October 5, 2020

PHOTO 10: View of Monitoring Well 50WW10
DATE: October 6, 2020

PHOTO 11: View of Monitoring Well 50WW11
DATE: October 1, 2020

PHOTO 12: View of Monitoring Well 50WW12
DATE: October 1, 2020

PHOTO 13: View of Monitoring Well 50WW13
DATE: October 1, 2020

PHOTO 14: View of Monitoring Well 50WW14
DATE: October 1, 2020

PHOTO 15: View of Monitoring Well 50WW15
DATE: October 5, 2020

PHOTO 16: View of Monitoring Well 50WW16
DATE: October 5, 2020

PHOTO 17: View of Monitoring Well 50WW17
DATE: October 6, 2020

PHOTO 18: View of Monitoring Well 50WW18
DATE: October 5, 2020

PHOTO 19: View of Monitoring Well 50WW19
DATE: October 6, 2020

PHOTO 20: View of Monitoring Well 50WW20
DATE: October 6, 2020

PHOTO 21: View of Monitoring Well 50WW21
DATE: October 6, 2020

PHOTO 22: View of Monitoring Well 50WW22
DATE: October 5, 2020

PHOTO 23: View of Monitoring Well 50WW23
DATE: October 5, 2020

PHOTO 24: View of Monitoring Well 50WW24
DATE: October 6, 2020

PHOTO 25: View of Monitoring Well 50WW25
DATE: October 6, 2020

PHOTO 26: View of Monitoring Well 50WW26
DATE: October 6, 2020

PHOTO 27: View of Monitoring Well 50WW27
DATE: October 6, 2020

PHOTO 28: View of Monitoring Well 50WW28
DATE: October 6, 2020

PHOTO 29: View of Monitoring Well 50WW29
DATE: October 1, 2020

01077409

WELL INSPECTION FORM

Job Name: LTHAP
Job No.: 501032
Client: Army
Site Name: 50

Well ID: 50WW05
Inspection Date: 10/1/20
Well Completion Depth/ Measured Depth: 25.30
Inspector: Scott Beesinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 4"
Condition: ☐ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077410

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: SD
Well ID: SDMW29
Inspection Date: 10/1/20
Well Completion Depth/Measured Depth: 38.10
Inspector: Scott Bassinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: Mg TH L
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2 11
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077411

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50

Well ID: 50WW12
Inspection Date: 10/1/20
Well Completion Depth/ Measured Depth: 37.92
Inspector: Scott Bessinger

☒ ABOVE GROUND

Well Accessible?				☒ Yes	☐ No
Protective casing?				☒ Yes	☐ No
Material: MeTAL					
Condition:	☒ Good	☐ Broken	☐ Cracked	☐ Need Paint	
Lid Condition:	☒ Good	☐ Broken	☒ Cracked		
Hinge Condition:	☒ Good	☐ Less than 50% rusted	☐ More than 50% rusted		

☐ FLUSH MOUNTED

Well cover present? NA				☐ Yes	☐ No
Condition:	☐ Good	☐ Broken	☐ Cracked		
Condition of Sump:	☐ Clean	☐ Dry	☐ Standing Water		

CONCRETE PAD:

Sloped away from casing?	☒ Yes	☐ No
Pad Area Cleared of Vegetation?	☒ Yes	☐ No

Check any of the following features that apply:

☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"

Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)

Cap present?	☒ Yes	☐ No
Well lock present?	☒ Yes	☐ No
Lock functioning properly?	☒ Yes	☐ No
Are bollards present and stable?	☒ Yes	☐ No
Well ID visible?	☒ Yes	☐ No

WELL INTEGRITY:

Bailer present?	☐ Yes	☒ No
Visual obstruction?	☒ Yes	☐ No
Is well open to completed depth? (complete when gauging)		
Is silt present in well? (complete when gauging)	☐ Yes	☒ No
Is silt greater than 10% of well screen length? (complete when gauging)	☐ Yes	☒ No

COMMENTS:

01077412

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50WW06
Inspection Date: 10/1/20
Well Completion Depth/ Measured Depth: 58.05
Inspector: Scott Beesinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077413

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50MW11
Inspection Date: 10/1/20
Well Completion Depth/ Measured Depth: 39.80
Inspector: Scott Baesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077414

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50MW13
Inspection Date: 10/1/20
Well Completion Depth/Measured Depth: 37.63
Inspector: Scott Bassinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077415

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 50103Z
Client: ARMY
Site Name: 50
Well ID: 50MW14
Inspection Date: 10/1/20
Well Completion Depth/Measured Depth: 60.70
Inspector: Scott Beesinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077416

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50

Well ID: 50MW09
Inspection Date: 10/5/20
Well Completion Depth/ Measured Depth: 62.42
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging)

COMMENTS:

01077417

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: SD
Well ID: SDMW08
Inspection Date: 10/5/20
Well Completion Depth/Measured Depth: 32.72
Inspector: Scott Beggsinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077418

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50MW22
Inspection Date: 10/5/20
Well Completion Depth/ Measured Depth: 37.82
Inspector: Scott Baessinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077419

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50

Well ID: 50MW23
Inspection Date: 10/5/20
Well Completion Depth/Measured Depth: 37.82
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077420

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50

Well ID: 50MW15
Inspection Date: 10/5/20
Well Completion Depth/ Measured Depth: 37.88
Inspector: Scott BRESINGER

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2 4
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging)

COMMENTS:

01077421

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50

Well ID: 50MW16
Inspection Date: 10/5/20
Well Completion Depth/ Measured Depth: 38.04
Inspector: Scott Blessinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077422

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: SD1032
Client: ARMY
Site Name: 50
Well ID: 50MW18
Inspection Date: 10/5/20
Well Completion Depth/ Measured Depth: 37.65
Inspector: Seth Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging) ☐ Yes ☒ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging)

COMMENTS:

01077423

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50MW07
Inspection Date: 10/6/20
Well Completion Depth/Measured Depth: 31.81
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging) ☐ Yes ☒ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging)

COMMENTS:

01077424

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50WW19
Inspection Date: 10/6/20
Well Completion Depth/Measured Depth: 64.88
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077425

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: SO
Well ID: SOWW17
Inspection Date: 10/6/20
Well Completion Depth/Measured Depth: 64.63
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077426

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW28
Inspection Date: 10/6/20
Well Completion Depth/Measured Depth: 27.10
Inspector: Scott Beggs, NGGR

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2 4 11
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077427

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50WW25
Inspection Date: 10/6/20
Well Completion Depth/Measured Depth: 57.80
Inspector: Scott Bassinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging) ☐ Yes ☒ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging)

COMMENTS:

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: SO
Well ID: SOWW01
Inspection Date: 10/6/20
Well Completion Depth/Measured Depth: 23,25
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077429

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: SO
Well ID: SOMW27
Inspection Date: 10/6/20
Well Completion Depth/ Measured Depth: 59.93
Inspector: Scott Baesinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA
Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077430

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARmy
Site Name: 50
Well ID: 50WW02
Inspection Date: 10/6/20
Well Completion Depth/Measured Depth: 22.37
Inspector: Scott Bassinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077431

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50WW10
Inspection Date: 10/6/20
Well Completion Depth/ Measured Depth: 111.23
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077432

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50WW03
Inspection Date: 10/6/20
Well Completion Depth/Measured Depth: 23.20
Inspector: Scott Bussinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077433

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW26
Inspection Date: 10/6/20
Well Completion Depth/Measured Depth: 62.80
Inspector: Scott Baggingar

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? SB ☒ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging)

COMMENTS:

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50WW21
Inspection Date: 10/6/20
Well Completion Depth/Measured Depth: 37.67
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077435

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW24
Inspection Date: 10/6/20
Well Completion Depth/ Measured Depth: 38.00
Inspector: Scott Beesinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 24
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077436

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50MW04
Inspection Date: 10/6/20
Well Completion Depth/Measured Depth: 23.20
Inspector: Scott Bussinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50MW20
Inspection Date: 10/6/20
Well Completion Depth/ Measured Depth: 57.80
Inspector: Scott Beesinger

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA
Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

APPENDIX B

January 2021 Photo Log

Photo No.	Date	Task and Description
1	1/28/2021	View of Monitoring Well 50WW01
2	1/28/2021	View of Monitoring Well 50WW02
3	1/28/2021	View of Monitoring Well 50WW03
4	1/28/2021	View of Monitoring Well 50WW04
5	1/25/2021	View of Monitoring Well 50WW05
6	1/28/2021	View of Monitoring Well 50WW06
7	1/25/2021	View of Monitoring Well 50WW08
8	1/28/2021	View of Monitoring Well 50WW09
9	1/28/2021	View of Monitoring Well 50WW10
10	1/28/2021	View of Monitoring Well 50WW11
11	1/28/2021	View of Monitoring Well 50WW12
12	1/28/2021	View of Monitoring Well 50WW13
13	1/28/2021	View of Monitoring Well 50WW14
14	1/28/2021	View of Monitoring Well 50WW20
15	1/28/2021	View of Monitoring Well 50WW21
16	1/28/2021	View of Monitoring Well 50WW22
17	1/28/2021	View of Monitoring Well 50WW23
18	1/28/2021	View of Monitoring Well 50WW24
19	1/28/2021	View of Monitoring Well 50WW26
20	1/28/2021	View of Monitoring Well 50WW27
21	1/25/2021	View of Monitoring Well 50WW29

PHOTO 1: View of Monitoring Well 50WW01
DATE: January 28, 2021

PHOTO 2: View of Monitoring Well 50WW02
DATE: January 28, 2021

PHOTO 3: View of Monitoring Well 50WW03
DATE: January 28, 2021

PHOTO 4: View of Monitoring Well 50WW04
DATE: January 28, 2021

PHOTO 5: View of Monitoring Well 50WW05
DATE: January 25, 2021

PHOTO 6: View of Monitoring Well 50WW06
DATE: January 28, 2021

PHOTO 7: View of Monitoring Well 50WW08
DATE: January 25, 2021

PHOTO 8: View of Monitoring Well 50WW09
DATE: January 28, 2021

PHOTO 9: View of Monitoring Well 50WW10
DATE: January 28, 2021

PHOTO 10: View of Monitoring Well 50WW11
DATE: January 28, 2021

PHOTO 11: View of Monitoring Well 50WW12
DATE: January 28, 2021

PHOTO 12: View of Monitoring Well 50WW13
DATE: January 28, 2021

PHOTO 13: View of Monitoring Well 50WW14
DATE: January 28, 2021

PHOTO 14: View of Monitoring Well 50WW20
DATE: January 28, 2021

PHOTO 15: View of Monitoring Well 50WW21
DATE: January 28, 2021

PHOTO 16: View of Monitoring Well 50WW22
DATE: January 28, 2021

PHOTO 17: View of Monitoring Well 50WW23
DATE: January 28, 2021

PHOTO 18: View of Monitoring Well 50WW24
DATE: January 28, 2021

PHOTO 19: View of Monitoring Well 50WW26
DATE: January 28, 2021

PHOTO 20: View of Monitoring Well 50WW27
DATE: January 28, 2021

PHOTO 21: View of Monitoring Well 50WW29
DATE: January 25, 2021

01077450

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50MW02
Inspection Date: 1/28/21
Well Completion Depth/Measured Depth: 22.20
Inspector: Scott Bessinger

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA
Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077451

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50WW10
Inspection Date: 1/28/21
Well Completion Depth/Measured Depth: 111.25
Inspector: Scott Bessinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077452

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50

Well ID: 50MW09
Inspection Date: 1/28/21
Well Completion Depth/ Measured Depth: 62.42
Inspector: Scott Baggenstoss

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

FLUSH MOUNTED

NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077453

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: SD1032
Client: Army
Site Name: 50
Well ID: 50WW03
Inspection Date: 1/28/21
Well Completion Depth/ Measured Depth: 22.98
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077454

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW22
Inspection Date: 1/28/21
Well Completion Depth/ Measured Depth: 37,80
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077455

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50MW21
Inspection Date: 1/28/21
Well Completion Depth/ Measured Depth: 37.63
Inspector: Scott Baggsinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2 11
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077456

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW26
Inspection Date: 1/28/24
Well Completion Depth/Measured Depth: 62.77
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077457

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50MW20
Inspection Date: 1/28/21
Well Completion Depth/ Measured Depth: 55.83
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077458

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50WW23
Inspection Date: 1/28/21
Well Completion Depth/ Measured Depth: 37.82
Inspector: Scott Bessinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077459

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 50/032
Client: ARMY
Site Name: 50
Well ID: 50WW24
Inspection Date: 1/28/21
Well Completion Depth/Measured Depth: 37.96
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077460

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW04
Inspection Date: 1/28/21
Well Completion Depth/ Measured Depth: 23.20
Inspector: Scott Beesinger

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA
Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077461

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50WW15
Inspection Date: 1/28/21
Well Completion Depth/ Measured Depth: 37.90
Inspector: Scott Bassinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077462

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW27
Inspection Date: 1/28/21
Well Completion Depth/Measured Depth: 59.94
Inspector: Scott Bressinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077463

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: SD
Well ID: SDMW12
Inspection Date: 1/28/21
Well Completion Depth/Measured Depth: 37.92
Inspector: Scott Boessinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077464

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 50103Z
Client: ARMY
Site Name: 50
Well ID: 50MW06
Inspection Date: 1/28/21
Well Completion Depth/ Measured Depth: 58.10
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077465

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW11
Inspection Date: 1/28/21
Well Completion Depth/Measured Depth: 37.80
Inspector: Scott Beesingar

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077466

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW13
Inspection Date: 1/28/21
Well Completion Depth/Measured Depth: 37.65
Inspector: Scott Beesinger

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077467

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW14
Inspection Date: 1/28/21
Well Completion Depth/ Measured Depth: 60.67
Inspector: Scott Bressinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077468

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50MW07
Inspection Date: 1/28/21
Well Completion Depth/Measured Depth: 31.81
Inspector: Scott Beasinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077469

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50MW16
Inspection Date: 11/28/21
Well Completion Depth/Measured Depth: 38.04
Inspector: Scott Beesinger

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA
Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches) 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077470

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW17
Inspection Date: 1/28/21
Well Completion Depth/ Measured Depth: 64.63
Inspector: Scott Beasinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077471

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50WW18
Inspection Date: 1/28/21
Well Completion Depth/ Measured Depth: 37.65
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077472

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50MW19
Inspection Date: 1/28/21
Well Completion Depth/Measured Depth: 64.88
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077473

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50

Well ID: 50WW25
Inspection Date: 1/28/21
Well Completion Depth/Measured Depth: 57.80
Inspector: Scott Beesinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077474

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARmy
Site Name: 50
Well ID: 50MW28
Inspection Date: 1/28/21
Well Completion Depth/Measured Depth:
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches) 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARmy
Site Name: 50
Well ID: 50MW08
Inspection Date: 1/25/21
Well Completion Depth/Measured Depth: 32.73
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077476

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: SD
Well ID: SDMW05
Inspection Date: 1/25/21
Well Completion Depth/ Measured Depth: 25.31
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches) 2 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077477

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 50032
Client: ARMY
Site Name: 50
Well ID: 50WW29
Inspection Date: 1/25/21
Well Completion Depth/Measured Depth: 38.10
Inspector: Scott Beesinger

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

APPENDIX B

April 2021 Photo Log

Photo No.	Date	Task and Description
1	4/6/2021	View of Monitoring Well 50WW01
2	4/5/2021	View of Monitoring Well 50WW02
3	4/5/2021	View of Monitoring Well 50WW03
4	4/5/2021	View of Monitoring Well 50WW04
5	4/5/2021	View of Monitoring Well 50WW05
6	4/5/2021	View of Monitoring Well 50WW06
7	4/5/2021	View of Monitoring Well 50WW07
8	4/5/2021	View of Monitoring Well 50WW08
9	4/5/2021	View of Monitoring Well 50WW09
10	4/5/2021	View of Monitoring Well 50WW10
11	4/5/2021	View of Monitoring Well 50WW11
12	4/5/2021	View of Monitoring Well 50WW12
13	4/5/2021	View of Monitoring Well 50WW13
14	4/5/2021	View of Monitoring Well 50WW14
15	4/5/2021	View of Monitoring Well 50WW15
16	4/6/2021	View of Monitoring Well 50WW16
17	4/5/2021	View of Monitoring Well 50WW17
18	4/5/2021	View of Monitoring Well 50WW19
19	4/5/2021	View of Monitoring Well 50WW20
20	4/5/2021	View of Monitoring Well 50WW21
21	4/5/2021	View of Monitoring Well 50WW22
22	4/5/2021	View of Monitoring Well 50WW23
23	4/5/2021	View of Monitoring Well 50WW24

Photo No.	Date	Task and Description
24	4/6/2021	View of Monitoring Well 50WW25
25	4/5/2021	View of Monitoring Well 50WW26
26	4/5/2021	View of Monitoring Well 50WW27
27	4/6/2021	View of Monitoring Well 50WW28
28	4/5/2021	View of Monitoring Well 50WW29

PHOTO 1: View of Monitoring Well 50WW01
DATE: April 6, 2021

PHOTO 2: View of Monitoring Well 50WW02
DATE: April 5, 2021

PHOTO 3: View of Monitoring Well 50WW03
DATE: April 5, 2021

PHOTO 4: View of Monitoring Well 50WW04
DATE: April 5, 2021

PHOTO 5: View of Monitoring Well 50WW05
DATE: April 5, 2021

PHOTO 6: View of Monitoring Well 50WW06
DATE: April 5, 2021

PHOTO 7: View of Monitoring Well 50WW07
DATE: April 5, 2021

PHOTO 8: View of Monitoring Well 50WW08
DATE: April 5, 2021

PHOTO 9: View of Monitoring Well 50WW09
DATE: April 5, 2021

PHOTO 10: View of Monitoring Well 50WW10
DATE: April 5, 2021

PHOTO 11: View of Monitoring Well 50WW11
DATE: April 5, 2021

PHOTO 12: View of Monitoring Well 50WW12
DATE: April 5, 2021

PHOTO 13: View of Monitoring Well 50WW13
DATE: April 5, 2021

PHOTO 14: View of Monitoring Well 50WW14
DATE: April 5, 2021

PHOTO 15: View of Monitoring Well 50WW15
DATE: April 5, 2021

PHOTO 16: View of Monitoring Well 50WW16
DATE: April 6, 2021

PHOTO 17: View of Monitoring Well 50WW17
DATE: April 5, 2021

PHOTO 18: View of Monitoring Well 50WW19
DATE: April 5, 2021

PHOTO 19: View of Monitoring Well 50WW20
DATE: April 5, 2021

PHOTO 20: View of Monitoring Well 50WW21
DATE: April 5, 2021

PHOTO 21: View of Monitoring Well 50WW22
DATE: April 5, 2021

PHOTO 22: View of Monitoring Well 50WW23
DATE: April 5, 2021

PHOTO 23: View of Monitoring Well 50WW24
DATE: April 5, 2021

PHOTO 24: View of Monitoring Well 50WW25
DATE: April 6, 2021

PHOTO 25: View of Monitoring Well 50WW26
DATE: April 5, 2021

PHOTO 26: View of Monitoring Well 50WW27
DATE: April 5, 2021

PHOTO 27: View of Monitoring Well 50WW28
DATE: April 6, 2021

PHOTO 28: View of Monitoring Well 50WW29
DATE: April 5, 2021

01077494

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARmy
Site Name: 50
Well ID: 50WW10
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 111.37
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077495

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50WW09
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 62.42
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077496

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50MW02
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 22.20
Inspector: Scott Beasinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077497

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW03
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 23.00
Inspector: Scott Baggenger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077498

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50 WW22
Inspection Date: 4/5/24
Well Completion Depth/ Measured Depth: 37.80
Inspector: Scott Boggs, NGI2

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077499

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50

Well ID: 50WW26
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 62.85
Inspector: Scott Beesinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077500

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW21
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 37.65
Inspector: Scott Baesinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077501

WELL INSPECTION FORM

Job Name: LTAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50MW20
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 55.84
Inspector: Scott Bassinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077502

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 50132
Client: Army
Site Name: 50
Well ID: 50WW23
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 37.84
Inspector: Scott Beasinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077503

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50MW24
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 38.02
Inspector: Scott Beesinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077504

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50MW27
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 62.85
Inspector: Scott Baessinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077505

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARmy
Site Name: 50
Well ID: 50WW15
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 37.90
Inspector: Scott Bressinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA
Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches) 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077506

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW04
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 23.22
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077507

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: SO

Well ID: SOWW07
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 31.82
Inspector: Scott Beesinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077508

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW19
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 65.00
Inspector: Scott Beesinger

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA
Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077509

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50WW17
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 64.55
Inspector: Scott Beesinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA
Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches) 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077510

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50MW18
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 37.44
Inspector: Scott Bassinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077511

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW08
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 32.72
Inspector: Scott Beesinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077512

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50

Well ID: 50MW05
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 25.31
Inspector: Scott Beesinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077513

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50WW29
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 37.90
Inspector: Scott Bassinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077514

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: SO
Well ID: ~~SDMW14~~ SOWW14
Inspection Date: 4/6/21
Well Completion Depth/ Measured Depth: 59.95
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077515

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW13
Inspection Date: 4/6/21
Well Completion Depth/ Measured Depth: 37.65
Inspector: Scott Beasinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077516

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 50103Z
Client: ARMY
Site Name: 50

Well ID: 50WW11
Inspection Date: 4/6/21
Well Completion Depth/ Measured Depth: 37.80
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50 MW06
Inspection Date: 4/6/21
Well Completion Depth/ Measured Depth: 58.11
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW12
Inspection Date: 4/6/21
Well Completion Depth/ Measured Depth: 37.84
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077519

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: SDWW01
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 23.23
Inspector: Scott Beesinger

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA
Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077520

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 50
Well ID: 50WW28
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 27.10
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077521

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50WW25
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 57.82
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01077522

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 50
Well ID: 50WW16
Inspection Date: 4/5/21
Well Completion Depth/ Measured Depth: 38.02
Inspector: SCOTT BASSINGER

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches) 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

Appendix C

Groundwater Sampling Forms

Note: The sample collection logs for the quarterly sampling events have been revised to correct the screen interval to ensure they match the depth on the well installation forms and the LHAAP-50 database.

LHAAP-50 Performance Sampling - July 2020

Well ID	VOCs (SW8260)	Perchlorate (SW6850)	Field Parameters	TOC	Anions	Dissolved Gases (ethene, ethane, methane, and carbon dioxide)	Ferrous Iron (field reading)	DHC	Frequency	Cost Code
Ground Water Sample Locations										
50WW05	x	x	x						Quarterly	
50WW06	x	x	x	x	x	x	x	x	Quarterly	
50WW08	x	x	x						Quarterly	
50WW11	x	x	x	x	x	x	x	x	Quarterly	
50WW12	x	x	x	x	x	x	x	x	Quarterly	
50WW13	x	x	x	x	x	x	x	x	Quarterly	
50WW14	x	x	x	x	x	x	x	x	Quarterly	
50WW29	x	x	x						Quarterly	

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**
Project No: **501032**

Location ID: **50WW05**
Sampler(s): Scott Bressinger

FIELD CONDITIONS Cloudy

SAMPLING INFORMATION

Sample No: 50WW05-20067708 **DATE/TIME:** 7/8/20 0919 **Pump Inlet Depth:** 20.54

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing
Purging Method/Equipment: Low flow Bladder Pump

Casing ID (in.): 4"
Purge Start Date/Time: 7/8/20 0925

Depth to Water - Initial (DTWi) (ft) 18.60
Purge End Date/Time: 7/8/20 0955

Depth to Well Bottom (ft) 25.35
Discharge Tube Length: NA
PID Reading: NA

Screen Interval (ft): ~~15.24-25.24~~ 14.34-24.34 ft btoc
Discharge Tube Diameter: 1/4"
Immersible Layer: Y / (N)

L George 07/20/2021
Approximate depth of pump inlet*(ft): 20.24
Pump Start Time: 0925

Ferrous Iron (Required Y or (N) _____ mg/L

2ND DEPTH TO WATER 18.60

APTIM

Sample Collection Log

Location ID: 50WW05		Sample No: 50WW05-20078								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
7/8/20	0930	100	0.5	18.68	1.54	22.89	7.67	0.0	127	0.83
	0935	100	1.0	18.73	1.49	22.27	7.15	0.0	117	0.31
	0940	100	1.5	18.76	1.46	21.95	7.08	0.0	101	0.13
	0945	100	2.0	18.78	1.46	21.87	7.07	0.0	100	0.13
	0950	100	2.5	18.79	1.45	21.81	7.07	0.0	99	0.12
	0955	100	3.0	18.79	1.45	21.76	7.07	0.0	99	0.12

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW06**

Sampler(s): Scott Bussinger

FIELD CONDITIONS CLEAR

SAMPLING INFORMATION

Sample No: 50WW06-200709 **DATE/TIME:** 7/9/20 1006 **Pump Inlet Depth:** 52.80

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2
		MI	DHC in Water-CENSUS-qPCR	1 x 1 L HDPE	Cool 4C

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow BLADDER Pump

Casing ID (in.): 4"

Purge Start Date/Time: 7/9/20 1015

Depth to Water - Initial (DTWi) (ft) 12.62

Purge End Date/Time: 7/9/20 1045

Depth to Well Bottom (ft) 58.00

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): ~~47.85 - 57.75~~ 47.35-57.35 ft btoc

Discharge Tube Diameter: 1/4"

Immersible Layer: Y / (N)

L George 07/20/2021

Approximate depth of pump inlet*(ft): 52.80

Pump Start Time: 1015

Ferrous Iron (Required (Y) or N) 0.25 mg/L

2ND DEPTH TO WATER- 12.62

APTIM

Sample Collection Log

Location ID: 50WW06 Sample No: 50WW06-20070709

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
7/9/20	1020	100	.5	12.70	0.128	24.26	6.68	13.2	197	2.97
	1025	100	1.0	12.75	0.095	23.53	5.79	8.3	240	2.63
	1030	100	1.5	12.78	0.087	23.50	5.61	5.4	254	2.47
	1035	100	2.0	12.80	0.086	23.47	5.61	5.0	255	2.45
	1040	100	2.5	12.81	0.086	23.45	5.60	4.5	256	2.43
	1045	100	3.0	12.82	0.086	23.42	5.60	3.8	257	2.42

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW08**

Sampler(s): Scott Beesinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW08-20~~0~~08 **DATE/TIME:** 7/8/20 0730 **Pump Inlet Depth:** 24.41

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point: Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 2"

Purge Start Date/Time: 7/8/20 0745

Depth to Water - Initial (DTWi) (ft) 20.50

Purge End Date/Time: 7/8/20 0815

Depth to Well Bottom (ft) 32.71

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 17.11-31.71

Discharge Tube Diameter: 1/4" Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 24.41

Pump Start Time: 0745

Ferrous Iron (Required Y or (N)) _____ mg/L

2ND DEPTH TO WATER - 20.50

APTIM

Sample Collection Log

Location ID: 50WW08				Sample No: 50WW08-20067 08						
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
					2.38					
7/8/20	0750	100	1.5	20.58	[illegible]	23.31	7.43	1.0	213	0.81
	0755	100	1.0	20.64	2.31	22.10	7.30	0.5	213	0.30
	0800	100	1.5	20.67	2.28	21.59	7.24	0.0	213	0.10
	0805	100	2.0	20.69	2.27	21.52	7.23	0.0	212	0.10
	0810	100	2.5	20.71	2.26	21.45	7.23	0.0	212	0.09
↓	0815	100	3.0	20.72	2.26	21.38	7.23	0.0	212	0.09

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW11**

Sampler(s): Scott Bassinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW11-20070704 **DATE/TIME:** 7/9/20 0900 **Pump Inlet Depth:** 29.80

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2
		MI	DHC in Water-CENSUS-qPCR	1 x 1 L HDPE	Cool 4C

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Casing ID (in.): 2"

Depth to Water - Initial (DTWi) (ft) 17.98

Depth to Well Bottom (ft) 37.78

Screen Interval (ft): 22.55 - 37.05

Approximate depth of pump inlet*(ft): 29.80

Ferrous Iron (Required Y or N) 0.51 mg/L

Purging Method/Equipment: Low Flow / Bladder Pump

Purge Start Date/Time: 7/9/20 0915

Purge End Date/Time: 7/9/20 0945

Discharge Tube Length: NA PID Reading: NA

Discharge Tube Diameter: NA Immersible Layer: Y / (N)

Pump Start Time: 0915

2ND DUPTH TO WATER. 17.98

APTIM

Sample Collection Log

Location ID: 50WW11				Sample No: 50WW11-20070709						
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
7/9/20	0920	100	.5	18.05	1.98	22.80	7.47	58.7	135	2.35
	0925	100	1.0	18.11	1.95	22.31	6.85	49.2	138	1.98
	0930	100	1.5	18.15	1.94	22.01	6.71	44.9	134	1.93
	0935	100	2.0	18.18	1.93	21.93	6.70	44.5	133	1.91
	0940	100	2.5	18.20	1.93	21.85	6.69	44.0	132	1.89
↓	0945	100	3.0	18.22	1.93	21.79	6.69	43.6	131	1.88

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW11**

Sampler(s): Scott Baesinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW11-20070709-FD **DATE/TIME:** 7/9/20 0900 **Pump Inlet Depth:** 29.80

Sampling Method: **Sample Purpose:** FD **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2
		MI	DHC in Water-CENSUS-qPCR	1 x 1 L HDPE	Cool 4C

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow / BLADDER Pump

Casing ID (in.): 2"

Purge Start Date/Time: 7/9/20 0915

Depth to Water - Initial (DTWi) (ft) 17.98

Purge End Date/Time: 7/9/20 0945

Depth to Well Bottom (ft) 37.78

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): 22.55-37.05

Discharge Tube Diameter: 1/4"

Immersible Layer: Y (N)

Approximate depth of pump inlet*(ft): 29.80

Pump Start Time: 0915

Ferrous Iron (Required (Y) or N) 0.51 mg/L

2ND Depth TO WATER - 17.98

APTIM

Sample Collection Log

Location ID: 50WW11 Sample No: 50WW11-20070921-FD

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
7/9/20	0920	100	.5	18.05	1.98	22.80	7.47	58.7	135	2.35
	0925	100	1.0	18.11	1.95	22.31	6.85	49.2	138	1.98
	0930	100	1.5	18.15	1.94	22.01	6.71	47.9	134	1.93
	0935	100	2.0	18.18	1.93	21.93	6.70	44.5	133	1.91
	0940	100	2.5	18.20	1.93	21.85	6.69	44.0	132	1.89
↓	0945	100	3.0	18.22	1.93	21.79	6.69	43.6	131	1.88

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW12**

Sampler(s): Scott Beesinger

FIELD CONDITIONS

CLEAR

SAMPLING INFORMATION

Sample No: 50WW12-20070709 **DATE/TIME:** 7/9/20 1100 **Pump Inlet Depth:** 29.75

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2
		MI	DHC in Water-CENSUS-qPCR	1 x 1 L HDPE	Cool 4C

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/BLADDER Pump

Casing ID (in.): 2"

Purge Start Date/Time: 7/9/20 1110

Depth to Water - Initial (DTWi) (ft) 17.00

Purge End Date/Time: 7/9/20 1140

Depth to Well Bottom (ft) 37.92

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): 22.50-37.00

Discharge Tube Diameter: 1/4"

Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 29.75

Pump Start Time: 1110

Ferrous Iron (Required) (Y or N) 0.31 mg/L

2ND DEPTH TO WATER- 17.00

APTIM

Sample Collection Log

Location ID: 50WW12		Sample No: 50WW12-200709								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
7/9/20	1115	100	1.5	17.08	4.26	22.64	6.33	27.3	221	0.69
	1120	100	2.0	17.13	4.35	21.88	6.25	22.5	217	0.24
	1125	100	1.5	17.17	4.39	21.54	6.21	18.7	203	0.06
	1130	100	2.0	17.19	4.40	21.45	6.20	18.4	202	0.05
	1135	100	2.5	17.21	4.40	21.38	6.20	17.8	201	0.05
↓	1140	100	3.0	17.22	4.40	21.31	6.20	17.2	201	0.05

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW13**

Sampler(s): Scott Beasinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW13-20070709 **DATE/TIME:** 7/9/20 0808 **Pump Inlet Depth:** 29.70

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2
		MI	DHC in Water-CENSUS-qPCR	1 x 1 L HDPE	Cool 4C

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Casing ID (in.): 2"

Depth to Water - Initial (DTWi) (ft) 19.35

Depth to Well Bottom (ft) 37.65

Screen Interval (ft): 22.44-36.44

Approximate depth of pump inlet*(ft): 29.70

Ferrous Iron (Required (Y) or N) 0.39 mg/L

Purging Method/Equipment: Low flow/Bladder Pump

Purge Start Date/Time: 7/9/20 0815

Purge End Date/Time: 7/9/20 0845

Discharge Tube Length: NA PID Reading: NA

Discharge Tube Diameter: 1/4" Immersible Layer: Y / (N)

Pump Start Time: 0815

2nd Depth to water 19.35

APTIM

Sample Collection Log

Location ID: 50WW13		Sample No: 50WW13-20007 09								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
7/9/20	0820	100	.5	19.42	2.11	22.31	6.99	35.6	83	1.20
	0825	100	1.0	19.48	2.15	21.18	6.95	29.2	99	0.91
	0830	100	1.5	19.52	2.15	21.03	6.90	24.7	99	0.82
	0835	100	2.0	19.55	2.15	20.94	6.89	24.3	98	0.80
	0840	100	2.5	19.57	2.15	20.86	6.88	23.6	97	0.79
	0845	100	3.0	19.58	2.15	20.80	6.88	23.1	97	0.78

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW14**

Sampler(s): Scott Bressinger

FIELD CONDITIONS CLEAR

SAMPLING INFORMATION

Sample No: 50WW14-20057~~09~~ **DATE/TIME:** 7/9/20 0~~6~~51 **Pump Inlet Depth:** 53.00

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2
		MI	DHC in Water-CENSUS-qPCR	1 x 1 L HDPE	Cool 4C

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low Flow/BLADDER Pump

Casing ID (in.): 2"

Purge Start Date/Time: 7/9/20 0705

Depth to Water - Initial (DTWi) (ft) 18.38

Purge End Date/Time: 7/9/20 0740

Depth to Well Bottom (ft) 60.70

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): 45.78 - 60.28

Discharge Tube Diameter: 1/4"

Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 53.00

Pump Start Time: 0705

Ferrous Iron (Required (Y) or N) 1.83 mg/L

2ND DEPTH TO WATER- 18.38

APTIM

Sample Collection Log

Location ID: 50WW14 Sample No: 50WW14-20070709

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
7/9/20	0710	100	.5	18.45	2.18	23.23	7.13	192	4	1.12
	0715	100	1.0	18.51	2.20	21.80	6.97	159	-17	0.83
	0720	100	1.5	18.55	2.22	21.35	6.81	132	-17	0.55
	0725	100	2.0	18.58	2.22	21.08	6.77	128	-20	0.48
	0730	100	2.5	18.60	2.21	20.98	6.76	127	-20	0.47
	0735	100	3.0	18.62	2.21	20.93	6.76	126	-21	0.44
↓	0740	100	3.5	18.63	2.21	20.87	6.75	125	-21	0.46

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW14**

Sampler(s): Scott Bassinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW14-20070709-MS **DATE/TIME:** 7/9/20 0651 **Pump Inlet Depth:** 53.00

Sampling Method: **Sample Purpose:** MS **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/BLADDER Pump

Casing ID (in.): 2"

Purge Start Date/Time: 7/9/20. 0705

Depth to Water - Initial (DTWi) (ft) 18.38

Purge End Date/Time: 7/9/20 0740

Depth to Well Bottom (ft) 60.70

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): 45.78 - 60.28

Discharge Tube Diameter: 1/4"

Immersible Layer: Y / N

Approximate depth of pump inlet*(ft): 53.00

Pump Start Time: 0705

Ferrous Iron (Required Y or N) 1.83 mg/L

2ND DEPTH TO WATER- 18.38

APTIM

Sample Collection Log

Location ID: 50WW14				Sample No: 50WW14-200709MS						
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
7/9/20	0710	100	.5	18.45	2.18	23.23	7.13	192	4	1.12
	0715	100	1.0	18.51	2.20	21.80	6.97	159	-17	0.83
	0720	100	1.5	18.55	2.22	21.35	6.81	132	-17	0.55
	0725	100	2.0	18.58	2.22	21.08	6.77	128	-20	0.48
	0730	100	2.5	18.60	2.21	20.98	6.76	127	-20	0.47
	0735	100	3.0	18.62	2.21	20.93	6.76	126	-21	0.46
↓	0740	100	3.5	18.63	2.21	20.87	6.75	125	-21	0.46

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW14**

Sampler(s): Scott Beesinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW14-200709-MSD **DATE/TIME:** 7/9/20 0651 **Pump Inlet Depth:** 53.00

Sampling Method: **Sample Purpose: MSD** **Sample Matrix: GW**

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Casing ID (in.): 2"

Depth to Water - Initial (DTWi) (ft) 18.38

Depth to Well Bottom (ft) 60.70

Screen Interval (ft): 45.78 - 60.28

Approximate depth of pump inlet*(ft): 53.00

Ferrous Iron (Required (Y) or N) 1.83 mg/L

Purging Method/Equipment: Low flow/BLADDER Pump

Purge Start Date/Time: 7/9/20 0705

Purge End Date/Time: 7/9/20 0740

Discharge Tube Length: NA PID Reading: NA

Discharge Tube Diameter: NA Immersible Layer: Y / (N)

Pump Start Time: 0705

2ND DEPTH TO WATER- 18.38

APTIM

Sample Collection Log

Location ID: 50WW14 Sample No: 50WW14-200709-MSD

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
7/9/20	0710	100	.5	18.45	2.18	23.23	7.13	192	4	1.12
	0715	100	1.0	18.51	2.20	21.80	6.97	154	-17	0.83
	0720	100	1.5	18.55	2.22	21.35	6.81	132	-17	0.55
	0725	100	2.0	18.58	2.22	21.08	6.77	128	-20	0.48
	0730	100	2.5	18.60	2.21	20.98	6.76	127	-20	0.47
	0735	100	3.0	18.62	2.21	20.93	6.76	126	-21	0.46
↓	0740	100	3.5	18.63	2.21	20.87	6.75	125	-21	0.46

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW29**

Sampler(s): Scott Beesinger

FIELD CONDITIONS

Cloudy

SAMPLING INFORMATION

Sample No: 50WW29-20080708 **DATE/TIME:** 7/8/20 0830 **Pump Inlet Depth:** 28.80

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 2"

Purge Start Date/Time: 7/8/20 0840

Depth to Water - Initial (DTWi) (ft) 17.69

Purge End Date/Time: 7/8/20 0910

Depth to Well Bottom (ft) 37.90

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): ~~18.80-38.80~~ 23.45-38.45 ft btoc

Discharge Tube Diameter: 1/4" Immersible Layer: Y / N

L George 07/20/2021

Approximate depth of pump inlet*(ft): 28.80

Pump Start Time: 0840

Ferrous Iron (Required Y or N) _____ mg/L

2ND DEPTH TO WATER- 17.69

APTIM

Sample Collection Log

Location ID: 50WW29 Sample No: 50WW29-20067 08

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10% 3.60		±0.1 units	No criteria		± 10% or 0.2 mg/L
7/8/20	0845	100	.5	17.876	[illegible]	21.50	7.03	3.3	155	0.69
	0850	100	1.0	17.82	3.64	20.31	6.68	1.1	89	0.22
	0855	100	1.5	17.85	3.64	20.05	6.54	0.5	70	0.04
	0900	100	2.0	17.87	3.65	19.96	6.53	0.0	69	0.03
	0905	100	2.5	17.89	3.65	19.89	6.52	0.0	68	0.03
	0910	100	3.0	17.90	3.65	19.83	6.51	0.0	68	0.03

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

LHAAP-50 Performance Sampling - October 2020

Well ID	VOCs (SW8260)	Perchlorate (SW6850)	Field Parameters	TOC	Anions	Dissolved Gases (ethene, ethane, methane, and carbon dioxide)	Ferrous Iron (field reading)	DHC	Frequency	Cost Code
Ground Water Sample Locations										
50WW05	x	x	x						Quarterly	
50WW06	x	x	x	x	x	x	x	x	Quarterly	
50WW08	x	x	x							
50WW09	x	x	x						Annual	
50WW11	x	x	x	x	x	x	x	x	Quarterly	
50WW12	x	x	x	x	x	x	x	x	Quarterly	
50WW13	x	x	x	x	x	x	x	x	Quarterly	
50WW14	x	x	x	x	x	x	x	x	Quarterly	
50WW15	x	x	x						Annual	
50WW16	x	x	x						Annual	
50WW18	x	x	x						Annual	
50WW22	x	x	x						Annual	
50WW23	x	x	x						Annual	
50WW29	x	x	x						Quarterly	

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50SW06**

Sampler(s): Scott Baesinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50SW06-___ **DATE/TIME:** 10/5/20 1155 **Pump Inlet Depth:** NA

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: NA

Casing ID (in.): NA

Purge Start Date/Time: NA

Depth to Water - Initial (DTWi) (ft) NA

Purge End Date/Time: NA

Depth to Well Bottom (ft) NA

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): NA

Discharge Tube Diameter: NA Immersible Layer: Y / N

Approximate depth of pump inlet*(ft): NA

Pump Start Time: NA

Ferrous Iron (Required Y or N) NA mg/L

WATER level AT 50WW16 is below DRAINAGE CHANNEL AT 50SW06 LOCATION SO NO SAMPLE is REQUIRED

APTIM

Sample Collection Log

Location ID: 50SW06 **Sample No: 50SW06-1805___**

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
	NO SAMPLE WAS COLLECTED									

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW05**

Sampler(s): Scott Beesinger

FIELD CONDITIONS

Clear

SAMPLING INFORMATION

Sample No: 50WW05-2010 01 **DATE/TIME:** 10/1/20 1238 **Pump Inlet Depth:** 20.24

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 4"

Purge Start Date/Time: 10/1/20 1245

Depth to Water - Initial (DTWi) (ft) 19.00

Purge End Date/Time: 10/1/20 1315

Depth to Well Bottom (ft) 25.30

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): ~~15.24-25.24~~ 14.34-24.34 ft btoc

Discharge Tube Diameter: 1/4" Immersible Layer: Y / (N)

L George 07/20/2021

Approximate depth of pump inlet*(ft): 20.24

Pump Start Time: 1245

Ferrous Iron (Required Y or (N)) _____ mg/L

2ND Depth to water - 19.00

APTIM

Sample Collection Log

Location ID: 50WW05		Sample No: 50WW05-201001								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
10/1/20	1250	100	0.5	19.08	1.50	20.50	6.87	0.0	109	0.73
	1255	100	1.0	19.13	1.46	20.43	6.83	0.0	104	0.45
	1300	100	1.5	19.16	1.45	20.40	6.74	0.0	104	0.39
	1305	100	2.0	19.18	1.44	20.37	6.73	0.0	105	0.38
	1310	100	2.5	19.19	1.44	20.33	6.72	0.0	105	0.37
↓	1315	100	3.0	19.19	1.44	20.30	6.71	0.0	105	0.37

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW06**

Sampler(s): Scott Bressinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW06-201001 **DATE/TIME:** 10/1/20 1010 **Pump Inlet Depth:** 52.80

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2
		MI	DHC in Water-CENSUS-qPCR	1 x 1 L HDPE	Cool 4C

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow / Bladder Pump

Casing ID (in.): 4"

Purge Start Date/Time: 10/1/20 1020

Depth to Water - Initial (DTWi) (ft) 17.05

Purge End Date/Time: 10/1/20 1050

Depth to Well Bottom (ft) 58.05

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): ~~47.85 - 57.75~~ 47.35-57.35 ft btoc

Discharge Tube Diameter: 1/4"

Immersible Layer: Y / (N)

L George 07/20/2021

Approximate depth of pump inlet*(ft): 52.80

Pump Start Time: 1020

Ferrous Iron (Required (Y) or N) 0.22 mg/L

2ND DEPTH TO WATER- 17.05

APTIM

Sample Collection Log

Location ID: 50WW06				Sample No: 50WW06-2010[illegible]01						
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
10/1/20	1025	100	.5	17.12	0.416	19.09	6.59	0.0	98	0.71
	1030	100	1.0	17.18	0.389	19.15	6.40	0.0	105	0.23
	1035	100	1.5	17.23	0.386	19.18	6.34	0.0	98	0.07
	1040	100	2.0	17.26	0.385	19.21	6.33	0.0	97	0.07
	1045	100	2.5	17.28	0.385	19.24	6.32	0.0	96	0.06
↓	1050	100	3.0	17.29	0.385	19.27	6.31	0.0	95	0.06

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW08**

Sampler(s): Scott Beesinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW08-201005 **DATE/TIME:** 10/5/20 0807 **Pump Inlet Depth:** 24.41

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow / Bladder Pump

Casing ID (in.): 2"

Purge Start Date/Time: 10/5/20 0815

Depth to Water - Initial (DTWi) (ft) 20.98

Purge End Date/Time: 10/5/20 0845

Depth to Well Bottom (ft) 32.72

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 17.11 - 31.71

Discharge Tube Diameter: 1/4" Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 24.41

Pump Start Time: 0815

Ferrous Iron (Required Y or (N)) _____ mg/L

2ND DEPTH TO WATER - 20.98

APTIM

Sample Collection Log

Location ID: 50WW08 Sample No: 50WW08-2010_05

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
10/5/20	0820	100	.5	21.05	2.35	17.55	6.44	13.5	210	3.88
	0825	100	1.0	21.11	2.37	17.91	6.08	5.4	215	3.32
	0830	100	1.5	21.15	2.37	18.08	6.03	2.9	219	3.22
	0835	100	2.0	21.18	2.36	18.15	6.02	1.1	219	3.20
	0840	100	2.5	21.20	2.36	18.21	6.02	0.5	220	3.18
↓	0845	100	3.0	21.22	2.36	18.27	6.02	0.0	220	3.17

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW09**

Sampler(s): Scott Beasinger

FIELD CONDITIONS CLEAR

SAMPLING INFORMATION

Sample No: 50WW09-201005 **DATE/TIME:** 10/5/20 0716 **Pump Inlet Depth:** 54.00

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow / Bladder Pump

Casing ID (in.): 2"

Purge Start Date/Time: 10/5/20 0730

Depth to Water - Initial (DTWi) (ft) 20.75

Purge End Date/Time: 10/5/20 0800

Depth to Well Bottom (ft) 62.42

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): 46.75 - 61.25

Discharge Tube Diameter: 1/4"

Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 54.00

Pump Start Time: 0730

Ferrous Iron (Required Y or (N)) _____ mg/L

2ND DEPTH TO WATER - 20.75

APTIM

Sample Collection Log

Location ID: 50WW09		Sample No: 50WW09-2010 05								
Date of Reading	**Time of Reading**	**Purge Rate**	**Total Purge**	**DTW**	**Cond.**	**Temp.**	**pH**	**Turbidity**	**ORP**	**DO**
		(ml/min)	**(L)**	**(ft)**	**(mS/cm)**	**(°C)**		**(NTU)**	**(mV)**	**(mg/L)**
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
10/5/20	0735	100	.5	20.83	1.81	18.21	6.68	142	212	1.02
	0740	100	1.0	20.89	2.00	18.30	6.32	123	215	0.60
	0745	100	1.5	20.93	2.07	18.33	6.23	115	217	0.45
	0750	100	2.0	20.96	2.07	18.36	6.22	114	218	0.44
	0755	100	2.5	20.98	2.08	18.40	6.21	113	219	0.44
	0800	100	3.0	20.99	2.08	18.43	6.20	113	219	0.43

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW11**

Sampler(s): Scott Beesinger

FIELD CONDITIONS CLEAR

SAMPLING INFORMATION

Sample No: 50WW11-2010 01 **DATE/TIME:** 10/1/20 0916 **Pump Inlet Depth:** 29.80

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2
		MI	DHC in Water-CENSUS-qPCR	1 x 1 L HDPE	Cool 4C

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow / BLADDER Pump

Casing ID (in.): 2"

Purge Start Date/Time: 10/1/20 0925

Depth to Water - Initial (DTWi) (ft) 18.55

Purge End Date/Time: 10/1/20 0955

Depth to Well Bottom (ft) 37.80

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): 22.55 - 37.05

Discharge Tube Diameter: 1/4"

Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 29.80

Pump Start Time: 0925

Ferrous Iron (Required (Y) or N) 0.57 mg/L

2ND DEPTH TO WATER - 18.55

APTIM

Sample Collection Log

Location ID: 50WW11		Sample No: 50WW11-201001								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
10/1/20	0930	100	0.5	18.62	2.09	18.61	6.77	36.3	106	1.48
	0935	100	1.0	18.68	2.06	18.85	6.71	27.0	100	1.25
	0940	100	1.5	18.72	2.08	18.90	6.71	21.5	96	1.16
	0945	100	2.0	18.74	2.09	18.95	6.70	20.8	95	1.14
	0950	100	2.5	18.76	2.10	18.99	6.70	20.4	94	1.13
↓	0955	100	3.0	18.77	2.10	19.05	6.70	20.0	94	1.12

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW11**

Sampler(s): Scott Beesinger

FIELD CONDITIONS CLEAR

SAMPLING INFORMATION

Sample No: 50WW11-2010**01**-FD **DATE/TIME:** 10/1/20 0916 **Pump Inlet Depth:** 29.80

Sampling Method: **Sample Purpose:** FD **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow / BLADDER Pump

Casing ID (in.): 2"

Purge Start Date/Time: 10/1/20 0925

Depth to Water - Initial (DTWi) (ft) 18.55

Purge End Date/Time: 10/1/20 0955

Depth to Well Bottom (ft) 37.80

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): 22.55 - 37.05

Discharge Tube Diameter: 1/4"

Immersible Layer: Y / N

Approximate depth of pump inlet*(ft): 29.80

Pump Start Time: 0925

Ferrous Iron (Required) (Y) or N) 0.57 mg/L

2ND DEPTH TO WATER -

APTIM

Sample Collection Log

Location ID: 50WW11 **Sample No: 50WW11-201001-FD**

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
10/1/20	0930	100	.5	18.62	2.09	18.61	6.77	36.3	106	1.48
	0935	100	1.0	18.68	2.06	18.85	6.71	27.0	100	1.25
	0940	100	1.5	18.72	2.08	18.90	6.71	21.5	96	1.16
	0945	100	2.0	18.74	2.09	18.95	6.70	20.8	95	1.14
	0950	100	2.5	18.76	2.10	18.99	6.70	20.4	94	1.13
↓	0955	100	3.0	18.77	2.10	19.05	6.70	20.0	94	1.12

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW12**

Sampler(s): Scott Beesinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW12-2010 01 **DATE/TIME:** 10/1/20 1102 **Pump Inlet Depth:** 29.75

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2
		MI	DHC in Water-CENSUS-qPCR	1 x 1 L HDPE	Cool 4C

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 2"

Purge Start Date/Time: 10/1/20 1110

Depth to Water - Initial (DTWi) (ft) 17.53

Purge End Date/Time: 10/1/20 1140

Depth to Well Bottom (ft) 37.92

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): 22.50-37.00

Discharge Tube Diameter: 1/4"

Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 29.75

Pump Start Time: 1110

Ferrous Iron (Required (Y) or N) 0.36 mg/L

2ND DEPTH TO WATER - 17.53

APTIM

Sample Collection Log

Location ID: 50WW12 Sample No: 50WW12-201001

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
10/1/20	1115	100	.5	17.60	4.77	19.40	6.55	41.3	98	0.80
	1120	100	1.0	17.66	4.81	19.51	6.51	35.7	94	0.30
	1125	100	1.5	17.70	4.84	19.54	6.47	31.6	95	0.29
	1130	100	2.0	17.72	4.85	19.58	6.46	31.1	95	0.28
	1135	100	2.5	17.73	4.85	19.62	6.46	32.5	96	0.28
↓	1140	100	3.0	17.73	4.85	19.65	6.46	32.0	96	0.27

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW13**

Sampler(s): Scott Beesinger

FIELD CONDITIONS CLEAR

SAMPLING INFORMATION

Sample No: 50WW13-201001 **DATE/TIME:** 10/1/20 0825 **Pump Inlet Depth:** 29.70

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2
		MI	DHC in Water-CENSUS-qPCR	1 x 1 L HDPE	Cool 4C

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/BLADDER Pump

Casing ID (in.): 2"

Purge Start Date/Time: 10/1/20 0835

Depth to Water - Initial (DTWi) (ft) 18.95

Purge End Date/Time: 10/1/20 0905

Depth to Well Bottom (ft) 37.63

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): 22.44-36.94

Discharge Tube Diameter: NA

Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 29.70

Pump Start Time: 0835

Ferrous Iron (Required (Y) or N) 0.44 mg/L

2ND DEPTH TO WATER - 18.95

APTIM

Sample Collection Log

Location ID: 50WW13		Sample No: 50WW13-2010 01								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
10/1/20	0840	100	.5	19.03	2.20	18.16	6.39	23.2	47	0.82
	0845	100	1.0	19.09	2.16	18.52	6.10	17.8	78	0.33
	0850	100	1.5	19.14	2.16	18.63	6.07	12.9	84	0.15
	0855	100	2.0	19.17	2.15	18.70	6.07	12.5	85	0.15
	0900	100	2.5	19.19	2.15	18.77	6.06	12.1	85	0.14
↓	0905	100	3.0	19.21	2.15	18.84	6.06	11.8	86	0.14

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW14**

Sampler(s): Scott Beesinger

FIELD CONDITIONS

CLEAR

SAMPLING INFORMATION

Sample No: 50WW14-2010 01 **DATE/TIME:** 10/1/20 0714 **Pump Inlet Depth:** 53.00

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2
		MI	DHC in Water-CENSUS-qPCR	1 x 1 L HDPE	Cool 4C

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/BLADDER Pump

Casing ID (in.): 2"

Purge Start Date/Time: 10/1/20 0725

Depth to Water - Initial (DTWi) (ft) 19.04

Purge End Date/Time: 10/1/20 0755

Depth to Well Bottom (ft) 60.70

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 45.78 - 60.28

Discharge Tube Diameter: 1/4" Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 53.00

Pump Start Time: 0725

Ferrous Iron (Required (Y) or N) 1.75 mg/L

2ND DEPTH TO WATER - 19.04

APTIM

Sample Collection Log

Location ID: 50WW14		Sample No: 50WW14-201001								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria	49	± 10% or 0.2 mg/L
10/1/20	0730	100	.5	19.10	2.40	17.14	6.87	203	[illegible]	0.75
	0735	100	1.0	19.15	2.28	18.21	6.20	175	29	0.30
	0740	100	1.5	19.19	2.24	18.36	6.24	163	9	0.17
	0745	100	2.0	19.21	2.23	18.42	6.25	162	8	0.16
	0750	100	2.5	19.23	2.22	18.48	6.26	160	7	0.16
	0755	100	3.0	19.24	2.22	18.53	6.26	159	7	0.15

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW14**

Sampler(s): Scott Beesinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW14-2010**01**-MS **DATE/TIME:** 10/1/20 0714 **Pump Inlet Depth:** 53.00

Sampling Method: **Sample Purpose:** MS **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 2"

Purge Start Date/Time: 10/1/20 0725

Depth to Water - Initial (DTWi) (ft) 19.04

Purge End Date/Time: 10/1/20 0755

Depth to Well Bottom (ft) 60.70

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): 45.78 - 60.28

Discharge Tube Diameter: 1/4"

Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 53.00

Pump Start Time: 0725

Ferrous Iron (Required (Y) or N) 1.75 mg/L

2nd Depth To water - 19.04

APTIM

Sample Collection Log

Location ID: 50WW14		Sample No: 50WW14-2010 01 -MS								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
10/1/20	0730	100	.5	19.10	2.40	17.14	6.87	203	49	0.75
	0735	100	1.0	19.15	2.28	18.21	6.20	175	29	0.30
	0740	100	1.5	19.19	2.24	18.36	6.24	163	9	0.17
	0745	100	2.0	19.21	2.23	18.42	6.25	162	8	0.16
	0750	100	2.5	19.23	2.22	18.48	6.26	160	7	0.16
	0755	100	3.0	19.24	2.22	18.53	6.26	159	7	0.15

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW14**

Sampler(s): Scott Beesinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW14-2010 01-MSD **DATE/TIME:** 10/1/20/0714 **Pump Inlet Depth:** 53.00

Sampling Method: **Sample Purpose: MSD** **Sample Matrix: GW**

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low Flow/BLADDER Pump

Casing ID (in.): 2"

Purge Start Date/Time: 10/1/20 0725

Depth to Water - Initial (DTWi) (ft) 19.04

Purge End Date/Time: 10/1/20 0755

Depth to Well Bottom (ft) 60.70

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): 45.78 - 60.28

Discharge Tube Diameter: 1/4"

Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 53.00

Pump Start Time: 0725

Ferrous Iron (Required (Y) or N) _____ mg/L

2ND DEPTH TO WATER - 19.04

APTIM

Sample Collection Log

Location ID: 50WW14		Sample No: 50WW14-201001-MSD								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
10/1/20	0730	100	.5	19.10	2.40	17.14	6.87	203	49	0.75
	0735	100	1.0	19.15	2.28	18.21	6.20	175	29	0.30
	0740	100	1.5	19.19	2.24	18.36	6.24	168	9	0.17
	0745	100	2.0	19.21	2.23	18.42	6.25	162	8	0.16
	0750	100	2.5	19.23	2.22	18.48	6.26	160	7	0.16
	0755	100	3.0	19.24	2.22	18.53	6.26	159	7	0.15

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW15**

Sampler(s): Scott Bassinger

FIELD CONDITIONS CLEAR

SAMPLING INFORMATION

Sample No: 50WW15-2010 05 **DATE/TIME:** 10/5/20 1028 **Pump Inlet Depth:** 29.50

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/BLADDER Pump

Casing ID (in.): 2"

Purge Start Date/Time: 10/5/20 1035

Depth to Water - Initial (DTWi) (ft) 17.63

Purge End Date/Time: 10/5/20 1105

Depth to Well Bottom (ft) 37.88

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 22.25 - 36.75

Discharge Tube Diameter: 1/4" Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 29.50

Pump Start Time: 1035

Ferrous Iron (Required Y or (N) _____ mg/L

2ND DEPTH TO WATER - 17.63

APTIM

Sample Collection Log

Location ID: 50WW15 Sample No: 50WW15-2010 05

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
10/5/20	1040	100	.5	17.70	2.02	17.87	7.05	31.2	188	1.21
	1045	100	1.0	17.76	1.95	18.17	6.62	25.5	182	0.97
	1050	100	1.5	17.80	1.92	18.45	6.44	21.6	174	0.86
	1055	100	2.0	17.82	1.91	18.52	6.43	21.1	173	0.85
	1100	100	2.5	17.83	1.90	18.59	6.42	20.5	172	0.84
↓	1105	100	3.0	17.83	1.90	18.64	6.42	20.0	172	0.83

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW16**

Sampler(s): Scott Bressinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW16-2010 05 **DATE/TIME:** 10/5/20 1114 **Pump Inlet Depth:** 29.91

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/BLADDER Pump

Casing ID (in.): 2"

Purge Start Date/Time: 10/5/20 1120

Depth to Water - Initial (DTWi) (ft) 18.50

Purge End Date/Time: 10/5/20 1150

Depth to Well Bottom (ft) 38.04

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 22.66 - 37.16

Discharge Tube Diameter: 1/4" Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 29.91

Pump Start Time: 1120

Ferrous Iron (Required Y or (N) _____ mg/L

2ND DEPTH TO WATER- 18.50

APTIM

Sample Collection Log

Location ID: 50WW16		Sample No: 50WW16-201005								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
10/5/20	1125	100	.5	18.58	0.333	19.23	6.59	41.3	153	0.81
	1130	100	1.0	18.64	0.220	19.18	5.81	32.5	190	0.42
	1135	100	1.5	18.68	0.223	19.15	5.62	28.9	198	0.28
	1140	100	2.0	18.70	0.224	19.11	5.61	28.5	199	0.27
	1145	100	2.5	18.72	0.224	19.06	5.61	28.0	200	0.26
↓	1150	100	3.0	18.74	0.224	19.02	5.60	27.7	201	0.26

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW18**

Sampler(s): Scott Beesinger

FIELD CONDITIONS CLEAR

SAMPLING INFORMATION

Sample No: 50WW18-20100505 **DATE/TIME:** 10/5/20 1159 **Pump Inlet Depth:** 29.62

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample | **Assoc. QC Samples** | **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/BLADDER Pump

Casing ID (in.): 2"

Purge Start Date/Time: 10/5/20 1210

Depth to Water - Initial (DTWi) (ft) 17.21

Purge End Date/Time: 10/5/20 1245

Depth to Well Bottom (ft) 37.65

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): 22.37 - 36.87

Discharge Tube Diameter: 1/4"

Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 29.62

Pump Start Time: 1210

Ferrous Iron (Required Y or (N)) _____ mg/L

2ND DEPTH TO WATER - 17.21

APTIM

Sample Collection Log

Location ID: 50WW18		Sample No: 50WW18-201005								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
10/5/20	1215	100	.5	17.29	3.16	19.73	6.70	58.4	221	0.99
	1220	100	1.0	17.34	3.19	19.51	6.72	52.7	197	0.38
	1225	100	1.5	17.37	3.23	19.39	6.69	47.3	182	0.23
	1230	100	2.0	17.39	3.24	19.20	6.68	44.7	174	0.16
	1235	100	2.5	17.41	3.24	19.16	6.67	44.2	173	0.16
	1240	100	3.0	17.42	3.24	19.11	6.67	43.6	172	0.15
↓	1245	100	3.5	17.42	3.24	19.07	6.67	43.1	172	0.15

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW18**

Sampler(s): Scott Buesinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW18-20100505-FD **DATE/TIME:** 10/5/20 1159 **Pump Inlet Depth:** 29.62

Sampling Method: **Sample Purpose:** FD **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow / Bladder Pump

Casing ID (in.): 2"

Purge Start Date/Time: 10/5/20 1210

Depth to Water - Initial (DTWi) (ft) 17.21

Purge End Date/Time: 10/5/20 1245

Depth to Well Bottom (ft) 37.65

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): 22.37-36.87

Discharge Tube Diameter: 1/4"

Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 29.62

Pump Start Time: 1210

Ferrous Iron (Required Y or (N)) _____ mg/L

2ND DEPTH TO WATER - 17.21

APTIM

Sample Collection Log

Location ID: 50WW18		Sample No: 50WW18-201005-FD								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
10/5/20	1215	100	0.5	17.29	3.16	19.73	6.70	58.4	221	0.99
	1220	100	1.0	17.34	3.19	19.51	6.72	52.7	197	0.38
	1225	100	1.5	17.37	3.23	19.39	6.69	47.3	182	0.23
	1230	100	2.0	17.39	3.24	19.20	6.68	44.7	174	0.16
	1235	100	2.5	17.41	3.24	19.16	6.67	44.2	173	0.16
	1240	100	3.0	17.42	3.24	19.11	6.67	43.6	172	0.15
	1245	100	3.5	17.42	3.24	19.07	6.67	43.1	172	0.15

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW22**

Sampler(s): Scott Biggs / NG42

FIELD CONDITIONS CLEAR

SAMPLING INFORMATION

Sample No: 50WW22-201005 **DATE/TIME:** 10/5/20 0852 **Pump Inlet Depth:** 29.27

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow / BLADDER Pump

Casing ID (in.): 2"

Purge Start Date/Time: 10/5/20 0900

Depth to Water - Initial (DTWi) (ft) 23.42

Purge End Date/Time: 10/5/20 0935

Depth to Well Bottom (ft) 37.82

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 21.97 - 36.57

Discharge Tube Diameter: 1/4" Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 29.27

Pump Start Time: 0900

Ferrous Iron (Required Y or (N)) _____ mg/L

2ND DEPTH TO WATER - 23.42

APTIM

Sample Collection Log

Location ID: 50WW22		Sample No: 50WW22-201005								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
10/5/20	0905	100	.5	23.50	4.17	17.03	6.72	17.7	209	1.45
	0910	100	1.0	23.56	4.17	17.28	6.55	13.2	212	1.30
	0915	100	1.5	23.60	4.16	17.75	6.18	10.1	220	1.11
	0920	100	2.0	23.63	4.14	17.97	6.01	8.1	222	1.00
	0925	100	2.5	23.65	4.13	18.06	6.00	6.9	223	0.97
	0930	100	3.0	23.67	4.12	18.12	6.00	5.4	223	0.96
	0935	100	3.5	23.68	4.12	18.17	5.99	4.5	223	0.95

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW23**

Sampler(s): Scott Beasinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW23-201005 **DATE/TIME:** 10/5/20 0943 **Pump Inlet Depth:** 29.67

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow / Bladder Pump

Casing ID (in.): 2"

Purge Start Date/Time: 10/5/20 0950

Depth to Water - Initial (DTWi) (ft) 22.30

Purge End Date/Time: 10/5/20 1020

Depth to Well Bottom (ft) 37.82

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 22.42 - 36.92

Discharge Tube Diameter: 1/4" Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 29.67

Pump Start Time: 0950

Ferrous Iron (Required Y or (N) _____ mg/L

2ND DEPTH TO WATER - 22.30

APTIM

Sample Collection Log

Location ID: 50WW23		Sample No: 50WW23-201005								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
10/5/20	0955	100	.5	22.37	5.49	17.39	6.63	8.3	203	1.51
	1000	100	1.0	22.43	5.53	17.91	6.39	4.1	211	1.30
	1005	100	1.5	22.47	5.58	18.17	6.32	2.0	214	1.16
	1010	100	2.0	22.49	5.58	18.24	6.31	0.7	215	1.14
	1015	100	2.5	22.51	5.59	18.30	6.31	0.0	216	1.12
	1020	100	3.0	22.52	5.59	18.36	6.30	0.0	216	1.10

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW29**

Sampler(s): Scott Beesinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW29-201001 **DATE/TIME:** 10/1/20 1152 **Pump Inlet Depth:** 27.80

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low Flow/Bladder Pump

Casing ID (in.): 2 11

Purge Start Date/Time: 10/1/20 1200

Depth to Water - Initial (DTWi) (ft) 18.03

Purge End Date/Time: 10/1/20 1230

Depth to Well Bottom (ft) 38.10

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): ~~17.80-37.80~~ 23.45-38.45 ft btoc

Discharge Tube Diameter: 1/4"

Immersible Layer: Y / (N)

L George 07/20/2021

Approximate depth of pump inlet*(ft): 27.80

Pump Start Time: 1200

Ferrous Iron (Required Y or (N)) _____ mg/L

2ND DEPTH TO WATER- 18.03

APTIM

Sample Collection Log

Location ID: 50WW29		Sample No: 50WW29-201001								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
10/1/20	1205	100	.5	18.10	3.88	19.61	6.08	17.9	122	0.61
	1210	100	1.0	18.16	3.87	19.53	5.63	9.4	137	0.19
	1215	100	1.5	18.20	3.84	19.37	5.63	7.1	140	0.07
	1220	100	2.0	18.22	3.84	19.33	5.62	6.2	141	0.07
	1225	100	2.5	18.24	3.83	19.26	5.62	5.0	141	0.07
	1230	100	3.0	18.26	3.83	19.22	5.62	4.2	142	0.06

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

LHAAP-50 Performance Sampling - January 2021

Well ID	VOCs (SW8260)	Perchlorate (SW6850)	Field Parameters	TOC	Anions	Dissolved Gases (ethene, ethane, methane, and carbon dioxide)	Ferrous Iron (field reading)	DHC	Frequency	Cost Code
Ground Water Sample Locations										
50WW05	x	x	x						Quarterly	
50WW06	x	x	x	x	x	x	x	x	Quarterly	
50WW08	x	x	x						Quarterly	
50WW11	x	x	x	x	x	x	x	x	Quarterly	
50WW12	x	x	x	x	x	x	x	x	Quarterly	
50WW13	x	x	x	x	x	x	x	x	Quarterly	
50WW14	x	x	x	x	x	x	x	x	Quarterly	
50WW29	x	x	x						Quarterly	

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50SW06**

Sampler(s): Scott BEESINGER

FIELD CONDITIONS

CLEAR

SAMPLING INFORMATION

Sample No: 50SW06-___ **DATE/TIME:** 1/28/21 **Pump Inlet Depth:** NA

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: NA

Casing ID (in.): NA

Purge Start Date/Time: NA

Depth to Water - Initial (DTWi) (ft) NA

Purge End Date/Time: NA

Depth to Well Bottom (ft) NA

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): NA

Discharge Tube Diameter: NA Immersible Layer: Y (N)

Approximate depth of pump inlet*(ft): NA

Pump Start Time: NA

Ferrous Iron (Required Y or N) NA mg/L

APTIM

Sample Collection Log

Location ID: 50SW06				Sample No: 50SW06-1805___						
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
	NO Sample Collected									

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**
Project No: **501032**

Location ID: **50WW05**
Sampler(s): Scott Beesinger

FIELD CONDITIONS

Clear

SAMPLING INFORMATION

Sample No: 50WW05-210125 **DATE/TIME:** 1/25/21 1252 **Pump Inlet Depth:** 20.24

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing
Purging Method/Equipment: Low flow/BLADDER Pump

Casing ID (in.): 4"
Purge Start Date/Time: 1/25/21 1300

Depth to Water - Initial (DTWi) (ft) 18.33
Purge End Date/Time: 1/25/21 1330

Depth to Well Bottom (ft) 25.31
Discharge Tube Length: NA
PID Reading: NA

Screen Interval (ft): ~~15.24 - 25.24~~ 14.34-24.34 ft btoc
L George 07/20/2021
Discharge Tube Diameter: 1/4"
Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 20.24
Pump Start Time: 1300

Ferrous Iron (Required Y or (N)) _____ mg/L

2ND Depth to water - 18.33

APTIM

Sample Collection Log

Location ID: 50WW05 Sample No: 50WW05-210125

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
1/25/21	1305	100	.5	18.40	1.80	19.44	6.89	0.0	162	0.79
	1310	100	1.0	18.46	1.76	19.38	7.03	0.0	119	0.22
	1315	100	1.5	18.50	1.76	19.42	7.03	0.0	97	0.06
	1320	100	2.0	18.52	1.75	19.46	7.02	0.0	96	0.06
	1325	100	2.5	18.53	1.75	19.49	7.02	0.0	95	0.06
↓	1330	100	3.0	18.53	1.75	19.52	7.02	0.0	94	0.05

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW06**

Sampler(s): Scott Beesinger

FIELD CONDITIONS

Clear / cool

SAMPLING INFORMATION

Sample No: 50WW06-210128 **DATE/TIME:** 1/28/21 0957 **Pump Inlet Depth:** 52.80

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2
		MI	DHC in Water-CENSUS-qPCR	1 x 1 L HDPE	Cool 4C

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 4"

Purge Start Date/Time: 1/28/21 1005

Depth to Water - Initial (DTWi) (ft) 13.50

Purge End Date/Time: 1/28/21 1035

Depth to Well Bottom (ft) 58.10

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): ~~47.85 - 57.75~~ 47.35-57.35 ft btoc

Discharge Tube Diameter: 1/4" Immersible Layer: Y / (N)

L George 07/20/2021

Approximate depth of pump inlet*(ft): 52.80

Pump Start Time: 1005

Ferrous Iron (Required) (Y) or N) 1.11 mg/L

ZWD Depth to water - 13.50

APTIM

Sample Collection Log

Location ID: 50WW06		Sample No: 50WW06-210128								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
1/28/21	1010	100	.5	13.57	0.210	11.22	6.80	9.0	53	0.76
	1015	100	1.0	13.62	0.155	11.66	6.11	5.8	81	0.27
	1020	100	1.5	13.65	0.131	11.85	5.69	5.0	105	0.10
	1025	100	2.0	13.67	0.130	11.90	5.68	4.2	106	0.10
	1030	100	2.5	13.68	0.130	11.96	5.67	3.5	106	0.10
	1035	100	3.0	13.68	0.130	12.00	5.67	2.9	107	0.09

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

Sample Collection Log

APTIM

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW08**

Sampler(s): Scott Beesinger

FIELD CONDITIONS

Clear

SAMPLING INFORMATION

Sample No: 50WW08-210125 **DATE/TIME:** 1/25/21 1158 **Pump Inlet Depth:** 24.41

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 2"

Purge Start Date/Time: 1/25/21 1215

Depth to Water - Initial (DTWi) (ft) 20.35

Purge End Date/Time: 1/25/21 1245

Depth to Well Bottom (ft) 32.73

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): 17.11 - 31.71

Discharge Tube Diameter: 1/4"

Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 24.41

Pump Start Time: 1215

Ferrous Iron (Required Y or (N) _____ mg/L

2ND DEPTH TO WATER- 20.35

APTIM

Sample Collection Log

Location ID: 50WW08 Sample No: 50WW08-210125

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
1/25/21	1220	100	.5	20.42	2.66	19.00	6.57	26.7	239	0.71
	1225	100	1.0	20.47	2.61	19.07	6.18	21.3	215	0.26
	1230	100	1.5	20.51	2.61	19.08	6.13	18.5	188	0.09
	1235	100	2.0	20.53	2.61	19.10	6.13	18.0	187	0.09
	1240	100	2.5	20.55	2.61	19.12	6.12	17.6	186	0.08
↓	1245	100	3.0	20.56	2.61	19.13	6.12	17.0	186	0.08

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW11**

Sampler(s): Scott Bressinger

FIELD CONDITIONS CLEAR / COLD

SAMPLING INFORMATION

Sample No: 50WW11-210128 **DATE/TIME:** 1/28/21 0904 **Pump Inlet Depth:** 29.80

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2
		MI	DHC in Water-CENSUS-qPCR	1 x 1 L HDPE	Cool 4C

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Casing ID (in.): 2"

Depth to Water - Initial (DTWi) (ft) 18.33

Depth to Well Bottom (ft) 37.80

Screen Interval (ft): 22.55 - 37.05

Approximate depth of pump inlet*(ft): 29.80

Ferrous Iron (Required (Y) or N) 1.91 mg/L

Purging Method/Equipment: Low flow/Bladder Pump

Purge Start Date/Time: 1/28/21 0915

Purge End Date/Time: 1/28/21 0945

Discharge Tube Length: NA PID Reading: NA

Discharge Tube Diameter: 1/4" Immersible Layer: Y / (N)

Pump Start Time: 0915

2ND DEPTH TO WATER - 18.33

APTIM

Sample Collection Log

Location ID: 50WW11 Sample No: 50WW11-2101 28

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
1/28/21	0920	100	.5	18.40	2.36	14.03	6.49	88.5	35	0.65
	0925	100	1.0	18.46	2.34	14.86	5.89	78.9	65	0.20
	0930	100	1.5	18.50	2.33	15.25	5.62	74.6	70	0.04
	0935	100	2.0	18.52	2.32	15.32	5.61	74.1	71	0.04
	0940	100	2.5	18.53	2.32	15.37	5.61	73.6	72	0.03
	0945	100	3.0	18.54	2.32	15.42	5.60	73.3	72	0.03

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW12**

Sampler(s): Scott Bassinger

FIELD CONDITIONS Clear / cool

SAMPLING INFORMATION

Sample No: 50WW12-210128 **DATE/TIME:** 1/28/21 1050 **Pump Inlet Depth:** 29.75

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2
		MI	DHC in Water-CENSUS-qPCR	1 x 1 L HDPE	Cool 4C

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 2"

Purge Start Date/Time: 1/28/21 1100

Depth to Water - Initial (DTWi) (ft) 17.28

Purge End Date/Time: 1/28/21 1130

Depth to Well Bottom (ft) 37.92

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 22.50 - 37.00

Discharge Tube Diameter: 1/4" Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 29.75

Pump Start Time: 1100

Ferrous Iron (Required (Y) or N) 0.97 mg/L

2ND DEPTH TO WATER 17.28

APTIM

Sample Collection Log

Location ID: 50WW12 Sample No: 50WW12-210128

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
1/28/21	1105	100	.5	17.30	4.76	14.69	5.83	56.6	96	0.71
	1110	100	1.0	17.36	4.77	15.05	5.80	48.7	98	0.26
	1115	100	1.5	17.40	4.77	15.38	5.73	44.8	99	0.09
	1120	100	2.0	17.42	4.78	15.44	5.72	44.2	99	0.09
	1125	100	2.5	17.44	4.78	15.50	5.71	43.7	100	0.08
	1130	100	3.0	17.45	4.77	15.56	5.71	43.3	100	0.08

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW12**

Sampler(s): Scott Beesinger

FIELD CONDITIONS

Clear / Cool

SAMPLING INFORMATION

Sample No: 50WW12-210128-MS **DATE/TIME:** 1/28/21 1050 **Pump Inlet Depth:** 29.85

Sampling Method: **Sample Purpose:** MS **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow / Bladder Pump

Casing ID (in.): 2"

Purge Start Date/Time: 1/28/21 1100

Depth to Water - Initial (DTWi) (ft) 17.28

Purge End Date/Time: 1/28/21 1130

Depth to Well Bottom (ft) 37.92

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 22.50 - 37.00

Discharge Tube Diameter: 1/4" Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 29.75

Pump Start Time: 1100

Ferrous Iron (Required (Y) or N) 0.97 mg/L

2ND DEPTH TO WATER - 17.28

APTIM

Sample Collection Log

Location ID: 50WW12 Sample No: 50WW12-210128-MS

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
1/28/21	1105	100	.5	17.30	4.76	14.69	5.83	56.6	96	0.71
	1110	100	1.0	17.36	4.77	15.05	5.80	48.7	98	0.26
	1115	100	1.5	17.40	4.77	15.38	5.73	44.8	99	0.09
	1120	100	2.0	17.42	4.78	15.44	5.72	44.2	90	0.09
	1125	100	2.5	17.44	4.78	15.50	5.71	43.7	100	0.08
	1130	100	3.0	17.45	4.77	15.56	5.71	43.3	100	0.08

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW12**

Sampler(s): Scott Beesinger

FIELD CONDITIONS Clear / cool

SAMPLING INFORMATION

Sample No: 50WW12-210128-MSD **DATE/TIME:** 1/28/21 1050 **Pump Inlet Depth:** 29.75

Sampling Method: **Sample Purpose:** MSD **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 2"

Purge Start Date/Time: 1/28/21 1100

Depth to Water - Initial (DTWi) (ft) 17.28

Purge End Date/Time: 1/28/21 1130

Depth to Well Bottom (ft) 37.92

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): 22.50-37.00

Discharge Tube Diameter: 1/4"

Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 29.75

Pump Start Time: 1100

Ferrous Iron (Required) (Y) or N) 0.97 mg/L

2ND DEPTH TO WATER - 17.28

APTIM

Sample Collection Log

Location ID: 50WW12 Sample No: 50WW12-210128-MSD

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria 56.6		± 10% or 0.2 mg/L
1/28/21	1105	100	.5	17.30	4.76	14.69	5.83	[illegible]	96	0.71
	1110	100	1.0	17.36	4.77	15.05	5.80	[illegible]	98	0.26
	1115	100	1.5	17.40	4.77	15.38	5.73	44.8	99	0.09
	1120	100	2.0	17.42	4.78	15.44	5.72	44.2	99	0.09
	1125	100	2.5	17.44	4.78	15.50	5.71	43.7	100	0.08
	1130	100	3.0	17.45	4.77	15.56	5.71	43.3	100	0.08

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW13**

Sampler(s): Scott Beesinger

FIELD CONDITIONS Clear / Cold

SAMPLING INFORMATION

Sample No: 50WW13-210128 **DATE/TIME:** 1/28/21 0809 **Pump Inlet Depth:** 29.69

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample | **Assoc. QC Samples** | **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2
		MI	DHC in Water-CENSUS-qPCR	1 x 1 L HDPE	Cool 4C

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 2"

Purge Start Date/Time: 1/28/21 0820

Depth to Water - Initial (DTWi) (ft) 18.75

Purge End Date/Time: 1/28/21 0850

Depth to Well Bottom (ft) 37.65

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 22.44 - 36.94

Discharge Tube Diameter: 1/4" Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 29.69

Pump Start Time: 0820

Ferrous Iron (Required (Y) or N) 1.43 mg/L

2ND DEPTH TO WATER - 18.75

APTIM

Sample Collection Log

Location ID: 50WW13 Sample No: 50WW13-210128

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
1/28/21	0825	100	.5	18.83	2.74	14.71	6.27	42.1	-21	0.70
	0830	100	1.0	18.89	2.71	15.29	6.15	31.5	-12	0.23
	0835	100	1.5	18.93	2.69	15.58	6.12	27.7	-7	0.07
	0840	100	2.0	18.95	2.69	15.64	6.11	27.3	-7	0.07
	0845	100	2.5	18.97	2.68	15.69	6.11	26.8	-6	0.06
	0850	100	3.0	18.99	2.68	15.73	6.11	26.2	-6	0.06

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

Sample Collection Log

APTIM

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW14**

Sampler(s): Scott Beesinger

FIELD CONDITIONS CLEAR / COLD

SAMPLING INFORMATION

Sample No: 50WW14-210128 **DATE/TIME:** 1/28/21 0705 **Pump Inlet Depth:** 53.03

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2
		MI	DHC in Water-CENSUS-qPCR	1 x 1 L HDPE	Cool 4C

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 2"

Purge Start Date/Time: 1/28/21 0720

Depth to Water - Initial (DTWi) (ft) 18.88

Purge End Date/Time: 1/28/21 0750

Depth to Well Bottom (ft) 60.67

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 45.78 - 60.28

Discharge Tube Diameter: 1/4" Immersible Layer: Y (N)

Approximate depth of pump inlet*(ft): 53.03

Pump Start Time: 0720

Ferrous Iron (Required (Y) or N) 3.77 mg/L

2ND DEPTH TO WATER 18.88

APTIM

Sample Collection Log

Location ID: 50WW14		Sample No: 50WW14-2101 28								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
1/29/21	0725	100	.5	18.95	2.75	14.78	6.37	237	-111	0.67
	0730	100	1.0	19.01	2.70	16.12	6.00	218	-118	0.23
	0735	100	1.5	19.05	2.69	16.44	5.92	210	-123	0.05
	0740	100	2.0	19.07	2.68	16.49	5.92	209	-124	0.05
	0745	100	2.5	19.09	2.68	16.55	5.91	208	-125	0.05
	0750	100	3.0	19.10	2.68	16.60	5.91	207	-125	0.04

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW14**

Sampler(s): Scott Beesinger

FIELD CONDITIONS CLEAR / COLD

SAMPLING INFORMATION

Sample No: 50WW14-210128-FD **DATE/TIME:** 1/28/21 0705 **Pump Inlet Depth:** 53.03

Sampling Method: **Sample Purpose:** FD **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: low flow/BLADDER Pump

Casing ID (in.): 2"

Purge Start Date/Time: 1/28/21 0720

Depth to Water - Initial (DTWi) (ft) 18.88

Purge End Date/Time: 1/28/21 0750

Depth to Well Bottom (ft) 60.67

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 45.78 - 60.28

Discharge Tube Diameter: 1/4" Immersible Layer: Y / N

Approximate depth of pump inlet*(ft): 53.03

Pump Start Time: 0720

Ferrous Iron (Required Y or N) 3.77 mg/L

2ND DEPTH TO WATER - 18.88

APTIM

Sample Collection Log

Location ID: 50WW14		Sample No: 50WW14-210128-FD								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
1/28/21	0725	100	.5	18.95	2.75	14.78	6.37	237	-111	0.67
	0730	100	1.0	19.01	2.70	16.12	6.00	218	-118	0.23
	0735	100	1.5	19.05	2.69	16.44	5.92	210	-123	0.05
	0740	100	2.0	19.07	2.68	16.49	5.92	209	-124	0.05
	0745	100	2.5	19.09	2.68	16.55	5.91	208	-125	0.05
	0750	100	3.0	19.10	2.68	16.60	5.91	207	-125	0.04

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Location ID: **50WW29**

Project No: **501032**

Sampler(s): Scott Beasinear

FIELD CONDITIONS

Clear

SAMPLING INFORMATION

Sample No: 50WW29-210125 **DATE/TIME:** 1/25/21 1337 **Pump Inlet Depth:** 27.80

Sampling Method: **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/BLADDER Pump

Casing ID (in.): 2"

Purge Start Date/Time: 1/25/21 1345

Depth to Water - Initial (DTWi) (ft) 17.18

Purge End Date/Time: 1/25/21 1415

Depth to Well Bottom (ft) 38.10

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): ~~17.80-37.80~~ 23.45-38.45 ft btoc

Discharge Tube Diameter: 1/4"

Immersible Layer: Y / (N)

L George 07/20/2021

Approximate depth of pump inlet*(ft): 27.80

Pump Start Time: 1345

Ferrous Iron (Required Y or (N) _____ mg/L

2ND DEPTH TO WATER - 17.18

APTIM

Sample Collection Log

Location ID: 50WW29					Sample No: 50WW29-210125					
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
1/25/21	1350	100	.5	17.25	3.98	18.39	6.25	47.1	21	0.67
	1355	100	1.0	17.31	4.10	18.17	5.79	41.3	10	0.19
	1400	100	1.5	17.35	4.12	18.12	5.68	35.8	8	0.03
	1405	100	2.0	17.37	4.12	18.06	5.67	35.5	7	0.03
	1410	100	2.5	17.39	4.13	18.02	5.66	35.0	7	0.02
↓	1415	100	3.0	17.40	4.13	17.98	5.66	34.5	7	0.02

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

LHAAP-50 Performance Sampling - April 2021

Well ID	VOCs (SW8260)	Perchlorate (SW6850)	Field Parameters	TOC	Anions	Dissolved Gases (ethene, ethane, methane, and carbon dioxide)	Ferrous Iron (field reading)	DHC	Frequency	Cost Code
Ground Water Sample Locations										
50WW05	x	x	x						Quarterly	
50WW06	x	x	x	x	x	x	x	x	Quarterly	
50WW08	x	x	x						Quarterly	
50WW11	x	x	x	x	x	x	x	x	Quarterly	
50WW12	x	x	x	x	x	x	x	x	Quarterly	
50WW13	x	x	x	x	x	x	x	x	Quarterly	
50WW14	x	x	x	x	x	x	x	x	Quarterly	
50WW29	x	x	x						Quarterly	

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50SW06**

Sampler(s): Scott Beesinger

FIELD CONDITIONS CLEAR

SAMPLING INFORMATION

Sample No: 50SW06-05 **DATE/TIME:** 4/5/21 1140 **Pump Inlet Depth:** NA

Sampling Method: **Sample Purpose: REG** **Sample Matrix: GW**

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: NA

Casing ID (in.): NA

Purge Start Date/Time: NA

Depth to Water - Initial (DTWi) (ft) NA

Purge End Date/Time: NA

Depth to Well Bottom (ft) NA

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): NA

Discharge Tube Diameter: NA

Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): NA

Pump Start Time: NA

Ferrous Iron (Required Y or (N)) _____ mg/L

APTIM

Sample Collection Log

Location ID: 50SW06 Sample No: 50SW06~~-1805~~ 2104-05

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
		NO SAMPLES ARE REQUIRED								

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW05**

Sampler(s): Scott Beesinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW05-210405 **DATE/TIME:** 4/5/21 0851 **Pump Inlet Depth:** 20.24

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample | **Assoc. QC Samples** | **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/BLADDER Pump

Casing ID (in.): 4"

Purge Start Date/Time: 4/5/21 0900

Depth to Water - Initial (DTWi) (ft) 17.95

Purge End Date/Time: 4/5/21 0930

Depth to Well Bottom (ft) 25.31

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): ~~15.24 - 25.24~~ 14.34-24.34 ft btoc

Discharge Tube Diameter: 1/4"

Immersible Layer: Y / (N)

L George 07/20/2021

Approximate depth of pump inlet*(ft): 20.24

Pump Start Time: 0900

Ferrous Iron (Required Y or (N)) _____ mg/L

2ND Depth To water - 17.95

APTIM

Sample Collection Log

Location ID: 50WW05		Sample No: 50WW05-210405								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
4/5/24	0905	100	.5	18.03	1.65	17.09	7.13	4.2	155	0.65
	0910	100	1.0	18.08	1.63	17.30	6.87	1.5	161	0.40
	0915	100	1.5	18.12	1.62	17.37	6.80	1.2	160	0.34
	0920	100	2.0	18.15	1.61	17.42	6.79	0.9	160	0.33
	0925	100	2.5	18.17	1.60	17.47	6.79	0.5	159	0.32
↓	0930	100	3.0	18.18	1.60	17.50	6.78	0.2	159	0.32

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW06**

Sampler(s): Scott Beesinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW06-210406 **DATE/TIME:** 4/6/21 0937 **Pump Inlet Depth:** 52.80

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample | **Assoc. QC Samples** | **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2
		MI	DHC in Water-CENSUS-qPCR	1 x 1 L HDPE	Cool 4C

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/BLADDER Pump

Casing ID (in.): 4"

Purge Start Date/Time: 4/6/21 0945

Depth to Water - Initial (DTWi) (ft) 12.44

Purge End Date/Time: 4/6/21 1015

Depth to Well Bottom (ft) 58.11

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): ~~47.85-57.75~~ 47.35-57.35 ft btoc

Discharge Tube Diameter: 1/4"

Immersible Layer: Y (N)

L George 07/20/2021

Approximate depth of pump inlet*(ft): 52.80

Pump Start Time: 0945

Ferrous Iron (Required (Y) or N) 0.45 mg/L

2ND DEPTH TO WATER - 12.44

APTIM

Sample Collection Log

Location ID: 50WW06		Sample No: 50WW06-210406								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
4/6/21	0950	100	.5	12.52	0.140	16.88	5.39	10.1	210	1.65
↓	0955	100	1.0	12.57	0.088	16.67	5.15	7.1	250	1.49
	1000	100	1.5	12.60	0.077	16.65	5.05	6.7	261	1.45
	1005	100	2.0	12.62	0.076	16.64	5.05	6.4	262	1.42
	1010	100	2.5	12.63	0.076	16.63	5.04	6.2	263	1.40
↓	1015	100	3.0	12.63	0.076	16.62	5.04	5.9	263	1.39

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

01077618

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW06**

Sampler(s): Scott Bassinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW06-210406-MS **DATE/TIME:** 4/6/21 0937 **Pump Inlet Depth:** 52.80

Sampling Method: LF **Sample Purpose:** MS **Sample Matrix:** GW

Appearance of Sample | **Assoc. QC Samples** | **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 4"

Purge Start Date/Time: 4/6/21 0945

Depth to Water - Initial (DTWi) (ft) 12.44

Purge End Date/Time: 4/6/21 1015

Depth to Well Bottom (ft) 58.11

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): ~~47.85 - 57.75~~ 47.35-57.35 ft btoc

Discharge Tube Diameter: 1/4" Immersible Layer: Y / N

L George 07/20/2021

Approximate depth of pump inlet*(ft): 52.80

Pump Start Time: 0945

Ferrous Iron (Required Y or N) 0.45 mg/L

2ND DEPTH TO WATER - 12.44

APTIM

Sample Collection Log

Location ID: 50WW06		Sample No: 50WW06-210406-MS								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
4/6/21	0950	100	.5	12.52	0.140	16.88	5.39	10.1	210	1.65
	0955	100	1.0	12.57	0.088	16.67	5.15	7.1	250	1.49
	1000	100	1.5	12.60	0.077	16.65	5.05	6.7	261	1.45
	1005	100	2.0	12.62	0.076	16.64	5.05	6.4	262	1.42
	1010	100	2.5	12.63	0.076	16.63	5.04	6.2	263	1.40
↓	1015	100	3.0	12.63	0.076	16.62	5.04	5.9	263	1.39

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW06**

Sampler(s): Scott Bassinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW06-210406-MSD **DATE/TIME:** 4/6/21 **Pump Inlet Depth:** 52.80

Sampling Method: LF **Sample Purpose:** MSD **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/BLADDER Pump

Casing ID (in.): 4"

Purge Start Date/Time: 4/6/21 0945

Depth to Water - Initial (DTWi) (ft) 12.44

Purge End Date/Time: 4/6/21 1015

Depth to Well Bottom (ft) 58.11

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): ~~47.85 - 57.75~~ 47.35-57.35 ft btoc

Discharge Tube Diameter: 1/4"

Immersible Layer: Y / (N)

L George 07/20/2021

Approximate depth of pump inlet*(ft): 52.80

Pump Start Time: 0945

Ferrous Iron (Required (Y) or N) 0.45 mg/L

2ND DEPTH TO WATER - 12.44

APTIM

Sample Collection Log

Location ID: 50WW06		Sample No: 50WW06-210406MSD								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
4/6/21	0950	100	.5	12.52	0.140	16.88	5.34	10.1	210	1.65
	0955	100	1.0	12.57	0.088	16.67	5.15	7.1	250	1.49
	1000	100	1.5	12.60	0.077	16.65	5.05	6.7	261	1.45
	1005	100	2.0	12.62	0.076	16.64	5.05	6.4	262	1.42
	1010	100	2.5	12.63	0.076	16.63	5.04	6.2	263	1.40
	1015	100	3.0	12.63	0.076	16.62	5.04	5.9	263	1.39

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW08**

Sampler(s): Scott Beasinger

FIELD CONDITIONS CLEAR

SAMPLING INFORMATION

Sample No: 50WW08-210405 **DATE/TIME:** 4/5/21 0805 **Pump Inlet Depth:** 24.41

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Casing ID (in.): 2"

Depth to Water - Initial (DTWi) (ft) 19.64

Depth to Well Bottom (ft) 32.72

Screen Interval (ft): 17.11 - 31.71

Approximate depth of pump inlet*(ft): 24.41

Ferrous Iron (Required Y or (N) _____ mg/L

Purging Method/Equipment: Low flow / BLADDER Pump

Purge Start Date/Time: 4/5/21 0815

Purge End Date/Time: 4/5/21 0845

Discharge Tube Length: NA PID Reading: NA

Discharge Tube Diameter: 1/4" Immersible Layer: Y / (N)

Pump Start Time: 0815

2ND DEPTH TO WATER - 19.64

APTIM

Sample Collection Log

Location ID: 50WW08		Sample No: 50WW08-210405								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
4/5/21	0820	100	.5	19.71	2.50	16.68	7.17	27.4	122	0.96
	0825	100	1.0	19.77	2.51	16.81	6.80	23.2	145	0.82
	0830	100	1.5	19.82	2.51	16.85	6.59	19.6	150	0.68
	0835	100	2.0	19.85	2.52	16.89	6.58	19.1	150	0.67
	0840	100	2.5	19.87	2.51	16.92	6.57	18.7	151	0.67
↓	0845	100	3.0	19.89	2.51	16.96	6.57	18.3	151	0.66

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW11**

Sampler(s): Scott Beesinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW11-210406 **DATE/TIME:** 4/6/21 0843 **Pump Inlet Depth:** 29.80

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample | **Assoc. QC Samples** | **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2
		MI	DHC in Water-CENSUS-qPCR	1 x 1 L HDPE	Cool 4C

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low Flow/Bladder Pump

Casing ID (in.): 2"

Purge Start Date/Time: 4/6/21 0850

Depth to Water - Initial (DTWi) (ft) 17.21

Purge End Date/Time: 4/6/21 0920

Depth to Well Bottom (ft) 37.80

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): 22.55 - 37.05

Discharge Tube Diameter: 1/4"

Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 29.80

Pump Start Time: 0850

Ferrous Iron (Required (Y) or N) 0.74 mg/L

2ND DEPTH TO WATER - 17.21

APTIM

Sample Collection Log

Location ID: 50WW11		Sample No: 50WW11-210406								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
4/6/21	0855	100	.5	17.28	1.99	17.86	6.22	76.5	161	1.39
	0900	100	1.0	17.34	1.98	17.95	5.78	68.1	195	1.24
	0905	100	1.5	17.38	1.97	17.98	5.72	61.8	198	1.20
	0910	100	2.0	17.40	1.96	18.03	5.71	61.3	199	1.18
	0915	100	2.5	17.42	1.96	18.08	5.71	60.7	200	1.17
	0920	100	3.0	17.43	1.96	18.11	5.70	60.3	200	1.16

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW11**

Sampler(s): Scott Beesinger

FIELD CONDITIONS

Clear

SAMPLING INFORMATION

Sample No: 50WW11-210406-FD **DATE/TIME:** 4/6/21 0843 **Pump Inlet Depth:** 29.80

Sampling Method: LF **Sample Purpose:** FD **Sample Matrix:** GW

Appearance of Sample | **Assoc. QC Samples** | **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low Flow/Bladder Pump

Casing ID (in.): 2"

Purge Start Date/Time: 4/6/21 0850

Depth to Water - Initial (DTWi) (ft) 17.21

Purge End Date/Time: 4/6/21 0920

Depth to Well Bottom (ft) 37.80

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 22.55 - 37.05

Discharge Tube Diameter: 1/4" Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 29.80

Pump Start Time: 0850

Ferrous Iron (Required (Y) or N) 0.74 mg/L

2ND DEPTH TO WATER - 17.21

APTIM

Sample Collection Log

Location ID: 50WW11		Sample No: 50WW11-210406-FD								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
4/6/21	0855	100	.5	17.28	1.99	17.86	6.22	76.5	161	1.39
	0900	100	1.0	17.34	1.98	17.95	5.78	68.1	195	1.24
	0905	100	1.5	17.38	1.97	17.98	5.72	61.8	198	1.20
	0910	100	2.0	17.40	1.96	18.03	5.71	61.3	199	1.18
	0915	100	2.5	17.42	1.96	18.08	5.71	60.7	200	1.17
↓	0920	100	3.0	17.43	1.96	18.11	5.70	60.3	200	1.16

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW12**

Sampler(s): Scott Beesinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW12-210406 **DATE/TIME:** 4/6/21 1043 **Pump Inlet Depth:** 29.75

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample | **Assoc. QC Samples** | **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2
		MI	DHC in Water-CENSUS-qPCR	1 x 1 L HDPE	Cool 4C

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Casing ID (in.): 2"

Depth to Water - Initial (DTWi) (ft) 16.20

Depth to Well Bottom (ft) 37.84

Screen Interval (ft): 22.50 - 37.00

Approximate depth of pump inlet*(ft): 29.75

Ferrous Iron (Required (Y) or N) 0.58 mg/L

Purging Method/Equipment: Low flow / BLADDER Pump

Purge Start Date/Time: 4/6/21 1055

Purge End Date/Time: 4/6/21 1125

Discharge Tube Length: NA PID Reading: NA

Discharge Tube Diameter: 1/4" Immersible Layer: Y / (N)

Pump Start Time: 1055

2ND DEPTH TO WATER - 16.20

APTIM

Sample Collection Log

Location ID: 50WW12		Sample No: 50WW12-2104 06								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
4/6/21	1100	100	.5	16.27	4.24	18.49	6.02	90.5	203	0.93
↓	1105	100	1.0	16.37	4.29	18.51	6.05	79.5	185	0.77
	1110	100	1.5	16.36	4.30	18.55	6.10	74.7	172	0.67
	1115	100	2.0	16.38	4.30	18.59	6.11	74.3	171	0.66
	1120	100	2.5	16.39	4.31	18.63	6.11	73.8	171	0.65
↓	1125	100	3.0	16.40	4.31	18.66	6.11	73.1	170	0.65

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW13**

Sampler(s): Scott Beesinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW13-210406 **DATE/TIME:** 4/6/21 0755 **Pump Inlet Depth:** 29.70

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2
		MI	DHC in Water-CENSUS-qPCR	1 x 1 L HDPE	Cool 4C

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow / BLADDER Pump

Casing ID (in.): 2"

Purge Start Date/Time: 4/6/21 0800

Depth to Water - Initial (DTWi) (ft) 17.65

Purge End Date/Time: 4/6/21 0830

Depth to Well Bottom (ft) 37.65

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): 22.44 - 36.94

Discharge Tube Diameter: 1/4"

Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 29.70

Pump Start Time: 0800

Ferrous Iron (Required (Y) or N) 0.65 mg/L

2ND DEPTH TO WATER - 17.65

APTIM

Sample Collection Log

Location ID: 50WW13		Sample No: 50WW13-210406								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
4/6/21	0805	100	.5	17.72	2.39	17.81	6.40	67.5	60	1.12
↓	0810	100	1.0	17.78	2.38	17.87	6.05	58.2	108	0.95
	0815	100	1.5	17.82	2.38	17.94	5.89	55.8	150	0.88
	0820	100	2.0	17.85	2.38	17.99	5.88	55.3	151	0.87
	0825	100	2.5	17.86	2.38	18.04	5.87	54.7	152	0.86
↓	0830	100	3.0	17.87	2.38	18.10	5.87	54.4	153	0.85

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW14**

Sampler(s): ~~Clear~~ Scott Beesinger

FIELD CONDITIONS Clear

SAMPLING INFORMATION

Sample No: 50WW14-210406 **DATE/TIME:** 4/6/21 0658 **Pump Inlet Depth:** 53.00

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2
		MI	DHC in Water-CENSUS-qPCR	1 x 1 L HDPE	Cool 4C

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 2"

Purge Start Date/Time: 4/6/21 0710

Depth to Water - Initial (DTWi) (ft) 17.82

Purge End Date/Time: 4/6/21 0740

Depth to Well Bottom (ft) 59.95

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 45.78 - 60.28

Discharge Tube Diameter: 1/4" Immersible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 53.00

Pump Start Time: 0710

Ferrous Iron (Required (Y) or N) 1.60 mg/L

2ND DEPTH TO WATER - 17.82

APTIM

Sample Collection Log

Location ID: 50WW14		Sample No: 50WW14-2104 06								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
4/6/21	0715	100	.5	17.90	2.44	18.13	6.57	90.5	-10	0.88
	0720	100	1.0	17.96	2.42	18.22	6.37	83.1	-30	0.38
	0725	100	1.5	18.00	2.41	18.24	6.35	77.8	-33	0.18
	0730	100	2.0	18.02	2.40	18.26	6.34	77.2	-33	0.18
	0735	100	2.5	18.04	2.40	18.28	6.34	77.6	-34	0.17
↓	0740	100	3.0	18.05	2.40	18.30	6.34	76.2	-34	0.17

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **50WW29**

Sampler(s): Scott Beesinger

FIELD CONDITIONS CLEAR

SAMPLING INFORMATION

Sample No: 50WW29-210405 **DATE/TIME:** 4/5/21 0936 **Pump Inlet Depth:** 27.80

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample | **Assoc. QC Samples** | **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Perchlorate in Water by 6850	1 x 125 mL HDPE	Cool 4C
		ALSHT	VOCs in Water by 8260B	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low Flow/BLADDER PUMP

Casing ID (in.): 2"

Purge Start Date/Time: 4/5/21 0945

Depth to Water - Initial (DTWi) (ft) 16.93

Purge End Date/Time: 4/5/21 ~~1045~~ 1020

Depth to Well Bottom (ft) 37.90

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): ~~17.80-37.80~~ 23.45-38.45 ft btoc

Discharge Tube Diameter: 1/4" Immersible Layer: Y (N)

L George 07/20/2021

Approximate depth of pump inlet*(ft): 27.80

Pump Start Time: 0945

Ferrous Iron (Required Y or (N) _____ mg/L

2ND DEPTH TO WATER - 16.93

APTIM

Sample Collection Log

Location ID: 50WW29 Sample No: 50WW29-210405

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
4/5/21	0950	100	1.5	17.00	4.07	17.65	6.14	22.7	210	1.05
	0955	100	1.0	17.06	4.12	17.49	5.68	19.3	225	0.96
	1000	100	1.5	17.10	4.14	17.53	5.53	14.5	240	0.63
	1005	100	2.0	17.12	4.16	17.58	5.54	12.9	244	0.58
	1010	100	2.5	17.14	4.16	17.63	5.55	12.4	245	0.57
	1015	100	3.0	17.15	4.16	17.69	5.56	11.8	245	0.56
↓	1020	100	3.5	17.15	4.16	17.73	5.56	11.6	245	0.56

Logged by: _____ Date: _____

QC'd by: _____ Date: _____

Appendix D

Laboratory Analytical Data Package

(Provided electronically on CD and on the Portal)

10515 Research Drive
Knoxville, TN 37932
Phone: (865) 573-8188
Fax: (865) 573-8133

Client: Susan Huang
APTIM
4005 Port Chicago Hwy
Concord, CA 94520

Phone: 925-288-2099

Fax:

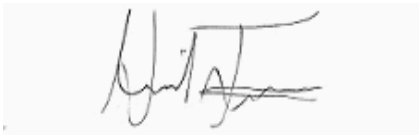
Identifier: 041RG **Date Rec:** 07/10/2020 **Report Date:** 07/17/2020

Client Project #: 501032 **Client Project Name:** LHAAP 50

Purchase Order #: 204818

Analysis Requested: CENSUS, Miscellaneous

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.

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **APTIM**
Project: LHAAP 50

MI Project Number: **041RG**
Date Received: 07/10/2020

Sample Information

Client Sample ID:		**50WW14-200709**	**50WW13-200709**	**50WW11-200709**	**50WW06-200709**	**50WW12-200709**
Sample Date:		07/09/2020	07/09/2020	07/09/2020	07/09/2020	07/09/2020
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		HT	HT	HT	HT	HT
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**8.00E-01**	**2.00E+00**	**5.00E-01 (J)**	<1.20E+00	**4.00E-01 (J)**

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 **7/10/2020**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	07/10/2020	07/17/2020	0 °C	99%	non-detect	non-detect

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

July 31, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS20070400**

Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Susan Huang,

ALS Environmental received 10 sample(s) on Jul 10, 2020 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: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS20070400

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20070400-01	50WW08-200708	Groundwater		08-Jul-2020 08:15	10-Jul-2020 09:00	☐
HS20070400-02	50WW29-200708	Groundwater		08-Jul-2020 09:10	10-Jul-2020 09:00	☐
HS20070400-03	50WW05-200708	Groundwater		08-Jul-2020 09:55	10-Jul-2020 09:00	☐
HS20070400-04	50WW14-200709	Groundwater		09-Jul-2020 07:40	10-Jul-2020 09:00	☐
HS20070400-05	50WW13-200709	Groundwater		09-Jul-2020 08:45	10-Jul-2020 09:00	☐
HS20070400-06	50WW11-200709	Groundwater		09-Jul-2020 09:45	10-Jul-2020 09:00	☐
HS20070400-07	50WW11-200709-FD	Groundwater		09-Jul-2020 09:45	10-Jul-2020 09:00	☐
HS20070400-08	50WW06-200709	Groundwater		09-Jul-2020 10:45	10-Jul-2020 09:00	☐
HS20070400-09	50WW12-200709	Groundwater		09-Jul-2020 11:40	10-Jul-2020 09:00	☐
HS20070400-10	Trip Blank	Water	CG-042320-232	09-Jul-2020 00:00	10-Jul-2020 09:00	☐

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant
Work Order: HS20070400

Work Order Comments

- The analysis for Methane, Methene, Ethane and CO2 by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.

Work Order Comments

- The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.
- The analysis for Perchlorate was subcontracted to ALS High Res Lab Houston, TX. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R365018

Sample ID: 50WW14-200709 (HS20070400-04)

- Sample HS20070400-03 failed surrogate 4-Bromofluorobenzene recovery. Compounds reported are not associated with this surrogate.

Batch ID: R365236

Sample ID: 50WW05-200708 (HS20070400-03)

- Sample HS20070400-03 failed surrogate 4-Bromofluorobenzene recovery. Compounds reported are not associated with this surrogate.

Sample ID: 50WW11-200709-FD (HS20070400-07)

- Sample HS20070400-07 failed surrogate 4-Bromofluorobenzene recovery. Compound reported is not associated with this surrogate.

Sample ID: HS20070625-09MS

- MS and MSD are for an unrelated sample

Batch ID: R365151

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: R364928

Sample ID: 50WW14-200709 (HS20070400-04MS)

- 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, Sulfate)

Sample ID: HS20070472-02MS

- MS and MSD are for an unrelated sample (Chloride)

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 50WW08-200708
Collection Date: 08-Jul-2020 08:15

ANALYTICAL REPORT
WorkOrder:HS20070400
Lab ID:HS20070400-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**0.95**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2020 14:46
1,2-Dichloroethane	**1.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2020 14:46
cis-1,2-Dichloroethene	**41**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2020 14:46
Tetrachloroethene	**1.4**		**0.30**	**1.0**	**1.0**	**UG/L**	1	15-Jul-2020 14:46
Trichloroethene	**390**		**1.0**	**2.5**	**5.0**	**UG/L**	5	15-Jul-2020 18:23
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2020 14:46
Surr: 1,2-Dichloroethane-d4	*86.9*			**0**	*81-118*	*%REC*	*1*	*15-Jul-2020 14:46*
Surr: 1,2-Dichloroethane-d4	*88.0*			**0**	*81-118*	*%REC*	*5*	*15-Jul-2020 18:23*
Surr: 4-Bromofluorobenzene	*107*			**0**	*85-114*	*%REC*	*5*	*15-Jul-2020 18:23*
Surr: 4-Bromofluorobenzene	*98.1*			**0**	*85-114*	*%REC*	*1*	*15-Jul-2020 14:46*
Surr: Dibromofluoromethane	*89.1*			**0**	*80-119*	*%REC*	*5*	*15-Jul-2020 18:23*
Surr: Dibromofluoromethane	*87.9*			**0**	*80-119*	*%REC*	*1*	*15-Jul-2020 14:46*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*15-Jul-2020 14:46*
Surr: Toluene-d8	*111*			**0**	*89-112*	*%REC*	*5*	*15-Jul-2020 18:23*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	24-Jul-2020 18:42

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

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 50WW29-200708
Collection Date: 08-Jul-2020 09:10

ANALYTICAL REPORT
WorkOrder:HS20070400
Lab ID:HS20070400-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2020 13:34
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2020 13:34
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2020 13:34
Tetrachloroethene	1.0	U	0.30	1.0	1.0	UG/L	1	15-Jul-2020 13:34
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2020 13:34
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2020 13:34
Surr: 1,2-Dichloroethane-d4	*86.2*			**0**	*81-118*	*%REC*	*1*	*15-Jul-2020 13:34*
Surr: 4-Bromofluorobenzene	*99.9*			**0**	*85-114*	*%REC*	*1*	*15-Jul-2020 13:34*
Surr: Dibromofluoromethane	*89.2*			**0**	*80-119*	*%REC*	*1*	*15-Jul-2020 13:34*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*15-Jul-2020 13:34*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	24-Jul-2020 18:42

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

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 50WW05-200708
Collection Date: 08-Jul-2020 09:55

ANALYTICAL REPORT
WorkOrder:HS20070400
Lab ID:HS20070400-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**4.9**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2020 14:22
1,2-Dichloroethane	**2.4**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2020 14:22
cis-1,2-Dichloroethene	**250**		**1.0**	**2.5**	**5.0**	**UG/L**	5	16-Jul-2020 13:35
Tetrachloroethene	1.0	U	0.30	1.0	1.0	UG/L	1	15-Jul-2020 14:22
Trichloroethene	**280**		**1.0**	**2.5**	**5.0**	**UG/L**	5	16-Jul-2020 13:35
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2020 14:22
Surr: 1,2-Dichloroethane-d4	*86.3*			**0**	*81-118*	*%REC*	*1*	*15-Jul-2020 14:22*
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*5*	*16-Jul-2020 13:35*
Surr: 4-Bromofluorobenzene	*85.7*			**0**	*85-114*	*%REC*	*1*	*15-Jul-2020 14:22*
Surr: 4-Bromofluorobenzene	*84.0*	*S*		**0**	*85-114*	*%REC*	*5*	*16-Jul-2020 13:35*
Surr: Dibromofluoromethane	*89.6*			**0**	*80-119*	*%REC*	*1*	*15-Jul-2020 14:22*
Surr: Dibromofluoromethane	*101*			**0**	*80-119*	*%REC*	*5*	*16-Jul-2020 13:35*
Surr: Toluene-d8	*92.1*			**0**	*89-112*	*%REC*	*1*	*15-Jul-2020 14:22*
Surr: Toluene-d8	*98.8*			**0**	*89-112*	*%REC*	*5*	*16-Jul-2020 13:35*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	24-Jul-2020 18:42

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

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 50WW14-200709
Collection Date: 09-Jul-2020 07:40

ANALYTICAL REPORT
WorkOrder:HS20070400
Lab ID:HS20070400-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-Jul-2020 14:58
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-Jul-2020 14:58
cis-1,2-Dichloroethene	**1.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	14-Jul-2020 14:58
Tetrachloroethene	1.0	U	0.30	1.0	1.0	UG/L	1	14-Jul-2020 14:58
Trichloroethene	**32**		**0.20**	**0.50**	**1.0**	**UG/L**	1	14-Jul-2020 14:58
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	14-Jul-2020 14:58
Surr: 1,2-Dichloroethane-d4	*88.4*			**0**	*81-118*	*%REC*	*1*	*14-Jul-2020 14:58*
Surr: 4-Bromofluorobenzene	*114*	*S*		**0**	*85-114*	*%REC*	*1*	*14-Jul-2020 14:58*
Surr: Dibromofluoromethane	*90.0*			**0**	*80-119*	*%REC*	*1*	*14-Jul-2020 14:58*
Surr: Toluene-d8	*112*			**0**	*89-112*	*%REC*	*1*	*14-Jul-2020 14:58*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**397**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Jul-2020 00:40
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	10-Jul-2020 17:07
Sulfate	**382**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Jul-2020 00:40
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	24-Jul-2020 18:42
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	22-Jul-2020 14:33

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

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 50WW13-200709
Collection Date: 09-Jul-2020 08:45

ANALYTICAL REPORT
WorkOrder:HS20070400
Lab ID:HS20070400-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**7.4**		**1.0**	**2.5**	**5.0**	**UG/L**	5	15-Jul-2020 16:46
1,2-Dichloroethane	**20**		**1.0**	**2.5**	**5.0**	**UG/L**	5	15-Jul-2020 16:46
cis-1,2-Dichloroethene	**120**		**1.0**	**2.5**	**5.0**	**UG/L**	5	15-Jul-2020 16:46
Tetrachloroethene	**3.4**	J	**1.5**	**5.0**	**5.0**	**UG/L**	5	15-Jul-2020 16:46
Trichloroethene	**3,400**		**10**	**25**	**50**	**UG/L**	50	15-Jul-2020 17:59
Vinyl chloride	2.5	U	1.0	2.5	5.0	UG/L	5	15-Jul-2020 16:46
Surr: 1,2-Dichloroethane-d4	*87.6*			**0**	*81-118*	*%REC*	*5*	*15-Jul-2020 16:46*
Surr: 1,2-Dichloroethane-d4	*87.1*			**0**	*81-118*	*%REC*	*50*	*15-Jul-2020 17:59*
Surr: 4-Bromofluorobenzene	*96.7*			**0**	*85-114*	*%REC*	*5*	*15-Jul-2020 16:46*
Surr: 4-Bromofluorobenzene	*89.9*			**0**	*85-114*	*%REC*	*50*	*15-Jul-2020 17:59*
Surr: Dibromofluoromethane	*90.5*			**0**	*80-119*	*%REC*	*5*	*15-Jul-2020 16:46*
Surr: Dibromofluoromethane	*90.2*			**0**	*80-119*	*%REC*	*50*	*15-Jul-2020 17:59*
Surr: Toluene-d8	*98.6*			**0**	*89-112*	*%REC*	*5*	*15-Jul-2020 16:46*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*50*	*15-Jul-2020 17:59*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**353**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Jul-2020 00:58
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	10-Jul-2020 17:25
Sulfate	**363**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Jul-2020 00:58
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	24-Jul-2020 18:42
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	22-Jul-2020 14:33
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	31-Jul-2020 13:49

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

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 50WW11-200709
Collection Date: 09-Jul-2020 09:45

ANALYTICAL REPORT
WorkOrder:HS20070400
Lab ID:HS20070400-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**15**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2020 15:34
1,2-Dichloroethane	**13**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2020 15:34
cis-1,2-Dichloroethene	**29**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2020 15:34
Tetrachloroethene	**2.4**		**0.30**	**1.0**	**1.0**	**UG/L**	1	15-Jul-2020 15:34
Trichloroethene	**1,600**		**5.0**	**12**	**25**	**UG/L**	25	15-Jul-2020 19:35
Vinyl chloride	**1.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2020 15:34
Surr: 1,2-Dichloroethane-d4	*87.8*			**0**	*81-118*	*%REC*	*1*	*15-Jul-2020 15:34*
Surr: 1,2-Dichloroethane-d4	*88.3*			**0**	*81-118*	*%REC*	*25*	*15-Jul-2020 19:35*
Surr: 4-Bromofluorobenzene	*98.7*			**0**	*85-114*	*%REC*	*25*	*15-Jul-2020 19:35*
Surr: 4-Bromofluorobenzene	*89.4*			**0**	*85-114*	*%REC*	*1*	*15-Jul-2020 15:34*
Surr: Dibromofluoromethane	*87.6*			**0**	*80-119*	*%REC*	*1*	*15-Jul-2020 15:34*
Surr: Dibromofluoromethane	*90.2*			**0**	*80-119*	*%REC*	*25*	*15-Jul-2020 19:35*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*15-Jul-2020 15:34*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*25*	*15-Jul-2020 19:35*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**306**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Jul-2020 01:16
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	10-Jul-2020 17:44
Sulfate	**391**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Jul-2020 01:16
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	24-Jul-2020 18:42
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	22-Jul-2020 14:33
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	31-Jul-2020 13:49

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

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 50WW11-200709-FD
Collection Date: 09-Jul-2020 09:45

ANALYTICAL REPORT
WorkOrder:HS20070400
Lab ID:HS20070400-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**15**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2020 15:58
1,2-Dichloroethane	**13**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2020 15:58
cis-1,2-Dichloroethene	**29**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2020 15:58
Tetrachloroethene	**2.7**		**0.30**	**1.0**	**1.0**	**UG/L**	1	15-Jul-2020 15:58
Trichloroethene	**1,500**		**5.0**	**12**	**25**	**UG/L**	25	16-Jul-2020 13:59
Vinyl chloride	**1.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2020 15:58
Surr: 1,2-Dichloroethane-d4	*90.0*			**0**	*81-118*	*%REC*	*1*	*15-Jul-2020 15:58*
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*25*	*16-Jul-2020 13:59*
Surr: 4-Bromofluorobenzene	*99.6*			**0**	*85-114*	*%REC*	*1*	*15-Jul-2020 15:58*
Surr: 4-Bromofluorobenzene	*75.6*	*S*		**0**	*85-114*	*%REC*	*25*	*16-Jul-2020 13:59*
Surr: Dibromofluoromethane	*89.9*			**0**	*80-119*	*%REC*	*1*	*15-Jul-2020 15:58*
Surr: Dibromofluoromethane	*101*			**0**	*80-119*	*%REC*	*25*	*16-Jul-2020 13:59*
Surr: Toluene-d8	*99.3*			**0**	*89-112*	*%REC*	*1*	*15-Jul-2020 15:58*
Surr: Toluene-d8	*98.1*			**0**	*89-112*	*%REC*	*25*	*16-Jul-2020 13:59*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**300**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Jul-2020 01:34
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	10-Jul-2020 18:02
Sulfate	**388**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Jul-2020 01:34
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	24-Jul-2020 18:42
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	22-Jul-2020 14:33
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	31-Jul-2020 13:49

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

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 50WW06-200709
Collection Date: 09-Jul-2020 10:45

ANALYTICAL REPORT
WorkOrder:HS20070400
Lab ID:HS20070400-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2020 13:58
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2020 13:58
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2020 13:58
Tetrachloroethene	1.0	U	0.30	1.0	1.0	UG/L	1	15-Jul-2020 13:58
Trichloroethene	**1.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2020 13:58
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2020 13:58
Surr: 1,2-Dichloroethane-d4	*87.5*			**0**	*81-118*	*%REC*	*1*	*15-Jul-2020 13:58*
Surr: 4-Bromofluorobenzene	*98.1*			**0**	*85-114*	*%REC*	*1*	*15-Jul-2020 13:58*
Surr: Dibromofluoromethane	*88.5*			**0**	*80-119*	*%REC*	*1*	*15-Jul-2020 13:58*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*15-Jul-2020 13:58*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**3.25**		**0.200**	**0.500**	**0.500**	**mg/L**	1	10-Jul-2020 18:20
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	10-Jul-2020 18:20
Sulfate	**8.12**		**0.200**	**0.500**	**0.500**	**mg/L**	1	10-Jul-2020 18:20
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	24-Jul-2020 18:42
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	22-Jul-2020 14:33
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	31-Jul-2020 13:49

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

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 50WW12-200709
Collection Date: 09-Jul-2020 11:40

ANALYTICAL REPORT
WorkOrder:HS20070400
Lab ID:HS20070400-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**7.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2020 15:10
1,2-Dichloroethane	**4.4**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2020 15:10
cis-1,2-Dichloroethene	**1.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2020 15:10
Tetrachloroethene	1.0	U	0.30	1.0	1.0	UG/L	1	15-Jul-2020 15:10
Trichloroethene	**550**		**2.0**	**5.0**	**10**	**UG/L**	10	15-Jul-2020 19:11
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2020 15:10
Surr: 1,2-Dichloroethane-d4	*87.6*			**0**	*81-118*	*%REC*	*10*	*15-Jul-2020 19:11*
Surr: 1,2-Dichloroethane-d4	*83.6*			**0**	*81-118*	*%REC*	*1*	*15-Jul-2020 15:10*
Surr: 4-Bromofluorobenzene	*91.3*			**0**	*85-114*	*%REC*	*10*	*15-Jul-2020 19:11*
Surr: 4-Bromofluorobenzene	*98.0*			**0**	*85-114*	*%REC*	*1*	*15-Jul-2020 15:10*
Surr: Dibromofluoromethane	*89.0*			**0**	*80-119*	*%REC*	*1*	*15-Jul-2020 15:10*
Surr: Dibromofluoromethane	*88.0*			**0**	*80-119*	*%REC*	*10*	*15-Jul-2020 19:11*
Surr: Toluene-d8	*98.3*			**0**	*89-112*	*%REC*	*1*	*15-Jul-2020 15:10*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*10*	*15-Jul-2020 19:11*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**1,080**		**4.00**	**10.0**	**10.0**	**mg/L**	20	11-Jul-2020 01:53
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	10-Jul-2020 18:38
Sulfate	**561**		**4.00**	**10.0**	**10.0**	**mg/L**	20	11-Jul-2020 01:53
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	24-Jul-2020 18:42
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	22-Jul-2020 14:33
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	31-Jul-2020 13:49

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

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: Trip Blank
Collection Date: 09-Jul-2020 00:00

ANALYTICAL REPORT
WorkOrder:HS20070400
Lab ID:HS20070400-10
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-Jul-2020 14:33
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-Jul-2020 14:33
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-Jul-2020 14:33
Tetrachloroethene	1.0	U	0.30	1.0	1.0	UG/L	1	14-Jul-2020 14:33
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-Jul-2020 14:33
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	14-Jul-2020 14:33
Surr: 1,2-Dichloroethane-d4	*89.6*			**0**	*81-118*	*%REC*	*1*	*14-Jul-2020 14:33*
Surr: 4-Bromofluorobenzene	*97.5*			**0**	*85-114*	*%REC*	*1*	*14-Jul-2020 14:33*
Surr: Dibromofluoromethane	*91.2*			**0**	*80-119*	*%REC*	*1*	*14-Jul-2020 14:33*
Surr: Toluene-d8	*89.0*			**0**	*89-112*	*%REC*	*1*	*14-Jul-2020 14:33*

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

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant **DATES REPORT**
WorkOrder: HS20070400

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R364928 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20070400-04	50WW14-200709	09 Jul 2020 07:40			11 Jul 2020 00:40	10
HS20070400-04	50WW14-200709	09 Jul 2020 07:40			10 Jul 2020 17:07	1
HS20070400-05	50WW13-200709	09 Jul 2020 08:45			11 Jul 2020 00:58	10
HS20070400-05	50WW13-200709	09 Jul 2020 08:45			10 Jul 2020 17:25	1
HS20070400-06	50WW11-200709	09 Jul 2020 09:45			11 Jul 2020 01:16	10
HS20070400-06	50WW11-200709	09 Jul 2020 09:45			10 Jul 2020 17:44	1
HS20070400-07	50WW11-200709-FD	09 Jul 2020 09:45			11 Jul 2020 01:34	10
HS20070400-07	50WW11-200709-FD	09 Jul 2020 09:45			10 Jul 2020 18:02	1
HS20070400-08	50WW06-200709	09 Jul 2020 10:45			10 Jul 2020 18:20	1
HS20070400-09	50WW12-200709	09 Jul 2020 11:40			11 Jul 2020 01:53	20
HS20070400-09	50WW12-200709	09 Jul 2020 11:40			10 Jul 2020 18:38	1
Batch ID: R365018 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS20070400-10	Trip Blank	09 Jul 2020 00:00			14 Jul 2020 14:33	1
Batch ID: R365018 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20070400-04	50WW14-200709	09 Jul 2020 07:40			14 Jul 2020 14:58	1
Batch ID: R365151 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20070400-01	50WW08-200708	08 Jul 2020 08:15			15 Jul 2020 18:23	5
HS20070400-01	50WW08-200708	08 Jul 2020 08:15			15 Jul 2020 14:46	1
HS20070400-02	50WW29-200708	08 Jul 2020 09:10			15 Jul 2020 13:34	1
HS20070400-03	50WW05-200708	08 Jul 2020 09:55			15 Jul 2020 14:22	1
HS20070400-05	50WW13-200709	09 Jul 2020 08:45			15 Jul 2020 17:59	50
HS20070400-05	50WW13-200709	09 Jul 2020 08:45			15 Jul 2020 16:46	5
HS20070400-06	50WW11-200709	09 Jul 2020 09:45			15 Jul 2020 19:35	25
HS20070400-06	50WW11-200709	09 Jul 2020 09:45			15 Jul 2020 15:34	1
HS20070400-07	50WW11-200709-FD	09 Jul 2020 09:45			15 Jul 2020 15:58	1
HS20070400-08	50WW06-200709	09 Jul 2020 10:45			15 Jul 2020 13:58	1
HS20070400-09	50WW12-200709	09 Jul 2020 11:40			15 Jul 2020 19:11	10
HS20070400-09	50WW12-200709	09 Jul 2020 11:40			15 Jul 2020 15:10	1
Batch ID: R365236 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20070400-03	50WW05-200708	08 Jul 2020 09:55			16 Jul 2020 13:35	5
HS20070400-07	50WW11-200709-FD	09 Jul 2020 09:45			16 Jul 2020 13:59	25

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS20070400

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R365453 (0)	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Groundwater	
HS20070400-04	50WW14-200709	09 Jul 2020 07:40			22 Jul 2020 14:33	1
HS20070400-05	50WW13-200709	09 Jul 2020 08:45			22 Jul 2020 14:33	1
HS20070400-06	50WW11-200709	09 Jul 2020 09:45			22 Jul 2020 14:33	1
HS20070400-07	50WW11-200709-FD	09 Jul 2020 09:45			22 Jul 2020 14:33	1
HS20070400-08	50WW06-200709	09 Jul 2020 10:45			22 Jul 2020 14:33	1
HS20070400-09	50WW12-200709	09 Jul 2020 11:40			22 Jul 2020 14:33	1
Batch ID: R365632 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS20070400-01	50WW08-200708	08 Jul 2020 08:15			24 Jul 2020 18:42	1
HS20070400-02	50WW29-200708	08 Jul 2020 09:10			24 Jul 2020 18:42	1
HS20070400-03	50WW05-200708	08 Jul 2020 09:55			24 Jul 2020 18:42	1
HS20070400-04	50WW14-200709	09 Jul 2020 07:40			24 Jul 2020 18:42	1
HS20070400-05	50WW13-200709	09 Jul 2020 08:45			24 Jul 2020 18:42	1
HS20070400-06	50WW11-200709	09 Jul 2020 09:45			24 Jul 2020 18:42	1
HS20070400-07	50WW11-200709-FD	09 Jul 2020 09:45			24 Jul 2020 18:42	1
HS20070400-08	50WW06-200709	09 Jul 2020 10:45			24 Jul 2020 18:42	1
HS20070400-09	50WW12-200709	09 Jul 2020 11:40			24 Jul 2020 18:42	1
Batch ID: R365997 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS20070400-05	50WW13-200709	09 Jul 2020 08:45			31 Jul 2020 13:49	1
HS20070400-06	50WW11-200709	09 Jul 2020 09:45			31 Jul 2020 13:49	1
HS20070400-07	50WW11-200709-FD	09 Jul 2020 09:45			31 Jul 2020 13:49	1
HS20070400-08	50WW06-200709	09 Jul 2020 10:45			31 Jul 2020 13:49	1
HS20070400-09	50WW12-200709	09 Jul 2020 11:40			31 Jul 2020 13:49	1

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS20070400

QC BATCH REPORT

Batch ID: R365018 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200714** Units: **UG/L** Analysis Date: **14-Jul-2020 12:57**
Client ID: Run ID: **VOA6_365018** SeqNo: **5661430** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
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
Tetrachloroethene	1.0	1.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*43.56*	*1.0*	*50*	*0*	*87.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.87*	*1.0*	*50*	*0*	*97.7*	*85 - 114*				
Surr: Dibromofluoromethane	*44.21*	*1.0*	*50*	*0*	*88.4*	*80 - 119*				
Surr: Toluene-d8	*51.58*	*1.0*	*50*	*0*	*103*	*89 - 112*				

LCS Sample ID: **VLCSW-200714** Units: **UG/L** Analysis Date: **14-Jul-2020 12:09**
Client ID: Run ID: **VOA6_365018** SeqNo: **5661429** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	19.09	1.0	20	0	95.5	71 - 131				
1,2-Dichloroethane	21.17	1.0	20	0	106	73 - 128				
cis-1,2-Dichloroethene	20.77	1.0	20	0	104	78 - 123				
Tetrachloroethene	19.44	1.0	20	0	97.2	74 - 129				
Trichloroethene	19.75	1.0	20	0	98.7	79 - 123				
Vinyl chloride	19.08	1.0	20	0	95.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.45*	*1.0*	*50*	*0*	*105*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.51*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*52.3*	*1.0*	*50*	*0*	*105*	*80 - 119*				
Surr: Toluene-d8	*49.43*	*1.0*	*50*	*0*	*98.9*	*89 - 112*				

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS20070400

QC BATCH REPORT

Batch ID: R365018 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS20070400-04MS** Units: **UG/L** Analysis Date: **14-Jul-2020 16:10**
Client ID: **50WW14-200709** Run ID: **VOA6_365018** SeqNo: **5661632** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1-Dichloroethene	20.85	1.0	20	0	104	71 - 131				
1,2-Dichloroethane	22.16	1.0	20	0	111	73 - 128				
cis-1,2-Dichloroethene	21.75	1.0	20	1.276	102	78 - 123				
Tetrachloroethene	23.83	1.0	20	0	119	74 - 129				
Trichloroethene	55.35	1.0	20	32.25	115	79 - 123				
Vinyl chloride	20.55	1.0	20	0	103	58 - 137				
Surr: 1,2-Dichloroethane-d4	*44.4*	*1.0*	*50*	*0*	*88.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.77*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*46.5*	*1.0*	*50*	*0*	*93.0*	*80 - 119*				
Surr: Toluene-d8	*50.57*	*1.0*	*50*	*0*	*101*	*89 - 112*				

MSD Sample ID: **HS20070400-04MSD** Units: **UG/L** Analysis Date: **14-Jul-2020 16:34**
Client ID: **50WW14-200709** Run ID: **VOA6_365018** SeqNo: **5661633** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1-Dichloroethene	19.69	1.0	20	0	98.4	71 - 131	20.85	5.73	20	
1,2-Dichloroethane	21.8	1.0	20	0	109	73 - 128	22.16	1.65	20	
cis-1,2-Dichloroethene	19.42	1.0	20	1.276	90.7	78 - 123	21.75	11.4	20	
Tetrachloroethene	22.49	1.0	20	0	112	74 - 129	23.83	5.79	20	
Trichloroethene	54.37	1.0	20	32.25	111	79 - 123	55.35	1.78	20	
Vinyl chloride	21.18	1.0	20	0	106	58 - 137	20.55	3.05	20	
Surr: 1,2-Dichloroethane-d4	*42.9*	*1.0*	*50*	*0*	*85.8*	*81 - 118*	*44.4*	*3.44*	*20*	
Surr: 4-Bromofluorobenzene	*56.32*	*1.0*	*50*	*0*	*113*	*85 - 114*	*50.77*	*10.4*	*20*	
Surr: Dibromofluoromethane	*43.77*	*1.0*	*50*	*0*	*87.5*	*80 - 119*	*46.5*	*6.05*	*20*	
Surr: Toluene-d8	*47.25*	*1.0*	*50*	*0*	*94.5*	*89 - 112*	*50.57*	*6.79*	*20*	

The following samples were analyzed in this batch: HS20070400-04 HS20070400-10

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS20070400

QC BATCH REPORT

Batch ID: R365151 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200715** Units: **UG/L** Analysis Date: **15-Jul-2020 13:10**
Client ID: Run ID: **VOA6_365151** SeqNo: **5663797** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
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
Tetrachloroethene	1.0	1.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*42.72*	*1.0*	*50*	*0*	*85.4*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.73*	*1.0*	*50*	*0*	*97.5*	*85 - 114*				
Surr: Dibromofluoromethane	*45.04*	*1.0*	*50*	*0*	*90.1*	*80 - 119*				
Surr: Toluene-d8	*50.81*	*1.0*	*50*	*0*	*102*	*89 - 112*				

LCS Sample ID: **VLCSW-200715** Units: **UG/L** Analysis Date: **15-Jul-2020 12:22**
Client ID: Run ID: **VOA6_365151** SeqNo: **5663796** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	20.18	1.0	20	0	101	71 - 131				
1,2-Dichloroethane	21.49	1.0	20	0	107	73 - 128				
cis-1,2-Dichloroethene	19.8	1.0	20	0	99.0	78 - 123				
Tetrachloroethene	21.43	1.0	20	0	107	74 - 129				
Trichloroethene	20.87	1.0	20	0	104	79 - 123				
Vinyl chloride	18.83	1.0	20	0	94.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.27*	*1.0*	*50*	*0*	*96.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.54*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*48.65*	*1.0*	*50*	*0*	*97.3*	*80 - 119*				
Surr: Toluene-d8	*50.69*	*1.0*	*50*	*0*	*101*	*89 - 112*				

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS20070400

QC BATCH REPORT

Batch ID: R365151 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS20070400-02MS** Units: **UG/L** Analysis Date: **15-Jul-2020 17:11**
Client ID: **50WW29-200708** Run ID: **VOA6_365151** SeqNo: **5663806** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1-Dichloroethene	21.78	1.0	20	0	109	71 - 131				
1,2-Dichloroethane	22.12	1.0	20	0	111	73 - 128				
cis-1,2-Dichloroethene	20.15	1.0	20	0	101	78 - 123				
Tetrachloroethene	22.58	1.0	20	0	113	74 - 129				
Trichloroethene	23.67	1.0	20	0	118	79 - 123				
Vinyl chloride	21.44	1.0	20	0	107	58 - 137				
Surr: 1,2-Dichloroethane-d4	*43.59*	*1.0*	*50*	*0*	*87.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*46.1*	*1.0*	*50*	*0*	*92.2*	*85 - 114*				
Surr: Dibromofluoromethane	*44.26*	*1.0*	*50*	*0*	*88.5*	*80 - 119*				
Surr: Toluene-d8	*49.81*	*1.0*	*50*	*0*	*99.6*	*89 - 112*				

MSD Sample ID: **HS20070400-02MSD** Units: **UG/L** Analysis Date: **15-Jul-2020 17:35**
Client ID: **50WW29-200708** Run ID: **VOA6_365151** SeqNo: **5663807** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1-Dichloroethene	18.06	1.0	20	0	90.3	71 - 131	21.78	18.7	20	
1,2-Dichloroethane	21.23	1.0	20	0	106	73 - 128	22.12	4.13	20	
cis-1,2-Dichloroethene	19.97	1.0	20	0	99.8	78 - 123	20.15	0.883	20	
Tetrachloroethene	21.77	1.0	20	0	109	74 - 129	22.58	3.64	20	
Trichloroethene	21.96	1.0	20	0	110	79 - 123	23.67	7.51	20	
Vinyl chloride	19.51	1.0	20	0	97.5	58 - 137	21.44	9.42	20	
Surr: 1,2-Dichloroethane-d4	*44.11*	*1.0*	*50*	*0*	*88.2*	*81 - 118*	*43.59*	*1.18*	*20*	
Surr: 4-Bromofluorobenzene	*49.43*	*1.0*	*50*	*0*	*98.9*	*85 - 114*	*46.1*	*6.97*	*20*	
Surr: Dibromofluoromethane	*45.48*	*1.0*	*50*	*0*	*91.0*	*80 - 119*	*44.26*	*2.74*	*20*	
Surr: Toluene-d8	*50.1*	*1.0*	*50*	*0*	*100*	*89 - 112*	*49.81*	*0.588*	*20*	

The following samples were analyzed in this batch: HS20070400-01 HS20070400-02 HS20070400-03 HS20070400-05
HS20070400-06 HS20070400-07 HS20070400-08 HS20070400-09

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS20070400

QC BATCH REPORT

Batch ID: R365236 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200716** Units: **UG/L** Analysis Date: **16-Jul-2020 13:11**
Client ID: Run ID: **VOA6_365236** SeqNo: **5665253** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*43.38*	*1.0*	*50*	*0*	*86.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.13*	*1.0*	*50*	*0*	*96.3*	*85 - 114*				
Surr: Dibromofluoromethane	*44.09*	*1.0*	*50*	*0*	*88.2*	*80 - 119*				
Surr: Toluene-d8	*48.96*	*1.0*	*50*	*0*	*97.9*	*89 - 112*				

LCS Sample ID: **VLCSW-200716** Units: **UG/L** Analysis Date: **16-Jul-2020 12:23**
Client ID: Run ID: **VOA6_365236** SeqNo: **5665252** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	20.28	1.0	20	0	101	78 - 123				
Trichloroethene	19.85	1.0	20	0	99.2	79 - 123				
Surr: 1,2-Dichloroethane-d4	*49.34*	*1.0*	*50*	*0*	*98.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.34*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*49.45*	*1.0*	*50*	*0*	*98.9*	*80 - 119*				
Surr: Toluene-d8	*49.82*	*1.0*	*50*	*0*	*99.6*	*89 - 112*				

MS Sample ID: **HS20070625-09MS** Units: **UG/L** Analysis Date: **16-Jul-2020 15:59**
Client ID: Run ID: **VOA6_365236** SeqNo: **5665260** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	23.68	1.0	20	2.4	106	78 - 123				
Trichloroethene	119.9	1.0	20	76.92	215	79 - 123				S
Surr: 1,2-Dichloroethane-d4	*36.61*	*1.0*	*50*	*0*	*73.2*	*81 - 118*				S
Surr: 4-Bromofluorobenzene	*48.6*	*1.0*	*50*	*0*	*97.2*	*85 - 114*				
Surr: Dibromofluoromethane	*45.1*	*1.0*	*50*	*0*	*90.2*	*80 - 119*				
Surr: Toluene-d8	*50.68*	*1.0*	*50*	*0*	*101*	*89 - 112*				

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS20070400

QC BATCH REPORT

Batch ID: R365236 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS20070625-09MSD** Units: **UG/L** Analysis Date: **16-Jul-2020 16:23**
Client ID: Run ID: **VOA6_365236** SeqNo: **5665261** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	20.49	1.0	20	2.4	90.4	78 - 123	23.68	14.4	20	
Trichloroethene	117.6	1.0	20	76.92	203	79 - 123	119.9	1.98	20	S
Surr: 1,2-Dichloroethane-d4	*41.65*	*1.0*	*50*	*0*	*83.3*	*81 - 118*	*36.61*	*12.9*	*20*	
Surr: 4-Bromofluorobenzene	*49.02*	*1.0*	*50*	*0*	*98.0*	*85 - 114*	*48.6*	*0.85*	*20*	
Surr: Dibromofluoromethane	*43.03*	*1.0*	*50*	*0*	*86.1*	*80 - 119*	*45.1*	*4.7*	*20*	
Surr: Toluene-d8	*41.33*	*1.0*	*50*	*0*	*82.7*	*89 - 112*	*50.68*	*20.3*	*20*	SR

The following samples were analyzed in this batch: HS20070400-03 HS20070400-07

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS20070400

QC BATCH REPORT

Batch ID: R364928 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-071020** Units: **mg/L** Analysis Date: **10-Jul-2020 16:49**
Client ID: Run ID: **ICS-Integrion_364928** SeqNo: **5659357** 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
Sulfate	0.2157	0.500								J

LCS Sample ID: **LCS-071020** Units: **mg/L** Analysis Date: **10-Jul-2020 18:56**
Client ID: Run ID: **ICS-Integrion_364928** SeqNo: **5659364** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.34	0.500	20	0	102	80 - 120				
Nitrogen, Nitrate (As N)	3.94	0.100	4	0	98.5	80 - 120				
Sulfate	19.92	0.500	20	0	99.6	80 - 120				

MS Sample ID: **HS20070472-02MS** Units: **mg/L** Analysis Date: **11-Jul-2020 12:45**
Client ID: Run ID: **ICS-Integrion_364928** SeqNo: **5659388** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1423	0.500	10	1442	-197	80 - 120				SEO
Nitrogen, Nitrate (As N)	1.971	0.100	2	0	98.5	80 - 120				
Sulfate	11.31	0.500	10	1.314	99.9	80 - 120				

MS Sample ID: **HS20070400-04MS** Units: **mg/L** Analysis Date: **10-Jul-2020 19:14**
Client ID: **50WW14-200709** Run ID: **ICS-Integrion_364928** SeqNo: **5659365** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	398.7	0.500	10	396.7	20.4	80 - 120				SEO
Nitrogen, Nitrate (As N)	2.352	0.100	2	0	118	80 - 120				
Sulfate	376.5	0.500	10	377.3	-7.22	80 - 120				SEO

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS20070400

QC BATCH REPORT

Batch ID: R364928 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS20070472-02MSD** Units: **mg/L** Analysis Date: **11-Jul-2020 13:03**
Client ID: Run ID: **ICS-Integrion_364928** SeqNo: **5659389** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1431	0.500	10	1442	-120	80 - 120	1423	0.54	20	SEO
Nitrogen, Nitrate (As N)	1.973	0.100	2	0	98.6	80 - 120	1.971	0.101	20	
Sulfate	11.42	0.500	10	1.314	101	80 - 120	11.31	0.984	20	

MSD Sample ID: **HS20070400-04MSD** Units: **mg/L** Analysis Date: **10-Jul-2020 19:32**
Client ID: **50WW14-200709** Run ID: **ICS-Integrion_364928** SeqNo: **5659366** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	398.6	0.500	10	396.7	18.8	80 - 120	398.7	0.0404	20	SEO
Nitrogen, Nitrate (As N)	2.366	0.100	2	0	118	80 - 120	2.352	0.623	20	
Sulfate	377.7	0.500	10	377.3	4.96	80 - 120	376.5	0.323	20	SEO

The following samples were analyzed in this batch: HS20070400-04 HS20070400-05 HS20070400-06 HS20070400-07 HS20070400-08 HS20070400-09

ALS Houston, US Date: 31-Jul-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: **HS20070400**

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	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kentucky	123043, 2020-2021	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
Maryland	343, 2019-2020	30-Sep-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2020-2021	30-Apr-2021
Oklahoma	2019-141	31-Aug-2020
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US Date: 31-Jul-20

Sample Receipt Checklist

Work Order ID: HS20070400 **Date/Time Received:** **10-Jul-2020 09:00**

Client Name: CBI-Houston **Received by:** **Jared R. Makan**

Completed By:	/S/ Paresh M. Giga	10-Jul-2020 11:18	**Reviewed by:**	/S/ RJ Modashia	10-Jul-2020 13:48
	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):	1.6C U/C	IR25
Cooler(s)/Kit(s):	45983	
Date/Time sample(s) sent to storage:	7/10/2020 11:50	

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: RJ Modashia

Project: APTIM LONGHORN
ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: LHAAP50 July 2020

Prepared By: Scott Beesinger

P.O. Number

HS20070400

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant

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 (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW6850	Remarks (Preservatives, etc.)	Lab I.D.#
SDWW08-200708	WG	7/8/20/0815		4	X					X		
SDWW29-200708	WG	7/8/20/0910		4	X					X		
SDWW05_200708	WG	7/8/20/0955		4	X					X		
SDWW14-200709	WG	7/9/20/0740		13	X	X	X	X	X	X		
SDWW14-200709-MS	WG	7/9/20/0740		13	X	X	X	X	X	X		
SDWW14-200709-MSD	WG	7/9/20/0740		13	X	X	X	X	X	X		
SDWW13-200709	WG	7/9/20/0845		13	X	X	X	X	X	X		
SDWW11-200709	WG	7/9/20/0945		13	X	X	X	X	X	X		

Additional Remarks: **Standard TAT on all parameters. Please email results to Susan.Huang@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	7/9/20	1430	Jm F	7/10/2020	0900						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

45983. vlc. 1.6°

#31

Client

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: LHAAP50 July 2020

Prepared By: Scott Beesinger

P.O. Number

HS20070400

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant

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 (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW6850	Remarks (Preservatives, etc.)	Lab I.D.#
SDWW11-200709-FD	WG	7/9/20/0945		13	X	X	X	X	X	X		
SDWW06-200709	WG	7/9/20/1045		13	X	X	X	X	X	X		
SDWW12-200709	WG	7/9/20/1140		13	X	X	X	X	X	X		
TRIP BLANK	W	7/9/20		2	X							

Additional Remarks: **Standard TAT on all parameters. Please email results to Susan.Huang@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	7/9/20	1430	S.M	7/10/20	0900						

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

45983

CUSTODY SEAL

Date: 7/9/20 Time: 1430
Name: Scott Beesinger
Company: BHGE

Seal Broken By:
Date: 07/10/20

45983 JUL 10 2020

Must Deliver Next Business Day
Time and Temperature Sensitive!

45983

ORIGIN ID:SGRA (903) 930-6193
ATT: MIKE MARTINEZ
APTIM ENVIRONMENTAL & INFRAST. INC
1203-B EAST GRAND AVE PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 01JUN20
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-50-BO 71987-RJ
RMA:

FedEx Express

FedEx
TRK# 0221 1891 8877 1456

FRI - 10 JUL 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

Part # 159469-434 Rit2 EXP 02/21

551C1/C7DB/104C

July 24, 2020 Service Request No:E2000627

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: HS20070400

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory July 10, 2020
For your reference, these analyses have been assigned our service request number **E2000627.**

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.:**	E2000627
Project:	HS20070398	**Date Received:**	07/10/20
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

One sample was received for analysis at ALS Environmental in Houston on 07/10/20.

The sample was received in good condition and are consistent with the accompanying chain of custody form. The sample was stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2000302: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of/in addition to a MS/MSD for this extraction batch. The LCS, LCSD, MS, and 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:**E2000627
Project: HS20070400

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2000627-001	50WW08-200708	7/8/2020	0815
E2000627-002	50WW29-200708	7/8/2020	0910
E2000627-003	50WW05-200708	7/8/2020	0955
E2000627-004	50WW14-200709	7/9/2020	0740
E2000627-005	50WW13-200709	7/9/2020	0845
E2000627-006	50WW11-200709	7/9/2020	0945
E2000627-007	50WW11-200709-FD	7/9/2020	0945
E2000627-008	50WW06-200709	7/9/2020	1045
E2000627-009	50WW12-200709	7/9/2020	1140

Service Request Summary

Folder #: **E2000627**
Client Name: ALS Environmental - US
Project Name: HS20070400
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: 07/10/20
Internal Due Date: 7/24/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20070400
EDD: No EDD Specified

11 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 2B
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2000627-001	50WW08-200708	Ground Water	07/08/20 0815	**IV**
E2000627-002	50WW29-200708	Ground Water	07/08/20 0910	**IV**
E2000627-003	50WW05-200708	Ground Water	07/08/20 0955	**IV**
E2000627-004	50WW14-200709	Ground Water	07/09/20 0740	**IV**
E2000627-005	50WW13-200709	Ground Water	07/09/20 0845	**IV**
E2000627-006	50WW11-200709	Ground Water	07/09/20 0945	**IV**
E2000627-007	50WW11-200709-FD	Ground Water	07/09/20 0945	**IV**
E2000627-008	50WW06-200709	Ground Water	07/09/20 1045	**IV**
E2000627-009	50WW12-200709	Ground Water	07/09/20 1140	**IV**

Service Request Summary

Folder #: **E2000627**
Client Name: ALS Environmental - US
Project Name: HS20070400
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: 07/10/20
Internal Due Date: 7/24/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20070400
EDD: No EDD Specified

11 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 2B
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	9	Level II due 7/24,level IV 7/31

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.
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.
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.
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.

Data Qualifiers

Lab Standard

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	20-030-0	3/26/2021
Department of Defense	A2LA 2897.01	11/30/2021
Hawaii Department of Health	2020	4/30/2021
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352	7/31/2020
Louisiana Department of Health and Hospitals	LA028-2020	12/31/2020
Maine Department of Health and Human Services	2020016	6/5/2022
Minnesota Department of Health	1785988	12/31/2020
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932019-1	7/31/2020
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New York Department of Health	11707	3/31/2021
Oklahoma Department of Environmental Quality	2019-067	8/31/2020
Tennessee Department of Environment and Concervation	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022
Utah Department of Health Environmental Laboratory Certification	TX026932019-9	7/31/2020
Washington Department of Health	C819	11/14/2020

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., 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#: 361870 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 7/20/20 10:39

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2000626-001	LH18/24-SP650_070920-BIX	.01	6850/ClO4 DOD			Water	10mL	
2	E2000627-001	50WW08-200708	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2000627-002	50WW29-200708	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2000627-003	50WW05-200708	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2000627-004	50WW14-200709	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2000627-005	50WW13-200709	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2000627-006	50WW11-200709	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2000627-007	50WW11-200709-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2000627-008	50WW06-200709	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2000627-009	50WW12-200709	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2000638-001	LH18/24-SP650_071420-BIX	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2000639-001	LH18/24-SP650_071420-BIX	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2000640-001	LH18/24-SP140_071420	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2000660-001	16EW01-200716	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2000660-003	16EW02-200716	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2000660-004	16EW02-200716-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
17	E2000660-005	16IW09-200716	.01	6850/ClO4 DOD			Ground Water	10mL	
18	E2000660-006	16RW05-200716	.01	6850/ClO4 DOD			Ground Water	10mL	
19	EQ2000302-01	MB		6850/ClO4 DOD			Liquid	10mL	
20	EQ2000302-02	LCS		6850/ClO4 DOD			Liquid	10mL	
21	EQ2000302-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
22	EQ2000302-04	50WW14-200709 MS	.01	6850/ClO4 DOD			Liquid	10mL	
23	EQ2000302-05	50WW14-200709 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 202037 Logbook Ref: Sodium Perchlorate Expires On: 05/22/2021

E2000626-001	100.00µL	E2000627-001	100.00µL	E2000627-002	100.00µL	E2000627-003	100.00µL	E2000627-004	100.00µL	E2000627-005	100.00µL
E2000627-006	100.00µL	E2000627-007	100.00µL	E2000627-008	100.00µL	E2000627-009	100.00µL	E2000638-001	100.00µL	E2000639-001	100.00µL
E2000640-001	100.00µL	E2000660-001	100.00µL	E2000660-003	100.00µL	E2000660-004	100.00µL	E2000660-005	100.00µL	E2000660-006	100.00µL
EQ2000302-02	100.00µL	EQ2000302-03	100.00µL	EQ2000302-04	100.00µL	EQ2000302-05	100.00µL				

Name: Perchlorate Intermediate Stock1 Inventory ID 209764 Logbook Ref: Perchlorate Int. Stock1 51820 Expires On: 11/18/2020

EQ2000302-02	1.00µL	EQ2000302-03	1.00µL	EQ2000302-04	10.00µL	EQ2000302-05	10.00µL

Preparation Information Benchsheet

Prep Run#: 361870
Team: Semivoa GCMS/GRIVERA

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 7/20/20 10:39

Preparation Steps

Step: Preparation
Started: 7/20/20 10:39
Finished: 7/20/20 14:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: _____ Date: _____

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:**	E2000627
Project:	HS20070400	**Date Collected:**	7/ 8/20 0815
Sample Matrix:	Ground Water	**Date Received:**	7/10/20
Sample Name:	50WW08-200708	**Units:**	µg/L
Lab Code:	E2000627-001	**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	**89.8**		1.00	0.500	0.250	10	7/20/20	7/24/20 14:31	361870	688371	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Collected:**	7/ 8/20 0910
Sample Matrix:	Ground Water	**Date Received:**	7/10/20
Sample Name:	50WW29-200708	**Units:**	µg/L
Lab Code:	E2000627-002	**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	**2.47**		1.00	0.500	0.250	10	7/20/20	7/23/20 12:21	361870	688323	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Collected:**	7/ 8/20 0955
Sample Matrix:	Ground Water	**Date Received:**	7/10/20
Sample Name:	50WW05-200708	**Units:**	µg/L
Lab Code:	E2000627-003	**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	**3.08**		1.00	0.500	0.250	10	7/20/20	7/23/20 12:29	361870	688323	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Collected:**	7/ 9/20 0740
Sample Matrix:	Ground Water	**Date Received:**	7/10/20
Sample Name:	50WW14-200709	**Units:**	µg/L
Lab Code:	E2000627-004	**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	**3.69**		1.00	0.500	0.250	10	7/20/20	7/24/20 15:29	361870	688371	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Collected:**	7/ 9/20 0845
Sample Matrix:	Ground Water	**Date Received:**	7/10/20
Sample Name:	50WW13-200709	**Units:**	µg/L
Lab Code:	E2000627-005	**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	**2900**		10.0	5.00	2.50	100	7/20/20	7/24/20 14:39	361870	688371	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Collected:**	7/ 9/20 0945
Sample Matrix:	Ground Water	**Date Received:**	7/10/20
Sample Name:	50WW11-200709	**Units:**	µg/L
Lab Code:	E2000627-006	**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	**4880**		10.0	5.00	2.50	100	7/20/20	7/24/20 14:47	361870	688371	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Collected:**	7/ 9/20 0945
Sample Matrix:	Ground Water	**Date Received:**	7/10/20
Sample Name:	50WW11-200709-FD	**Units:**	µg/L
Lab Code:	E2000627-007	**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	**4960**		20.0	10.0	5.00	200	7/20/20	7/22/20 19:36	361870	688323	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Collected:**	7/ 9/20 1045
Sample Matrix:	Ground Water	**Date Received:**	7/10/20
Sample Name:	50WW06-200709	**Units:**	µg/L
Lab Code:	E2000627-008	**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	**1.69**		0.100	0.0500	0.0250	1	7/20/20	7/20/20 16:14	361870	688323	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Collected:**	7/ 9/20 1140
Sample Matrix:	Ground Water	**Date Received:**	7/10/20
Sample Name:	50WW12-200709	**Units:**	µg/L
Lab Code:	E2000627-009	**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	**43000**		100	50.0	25.0	1000	7/20/20	7/24/20 14:55	361870	688371	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2000302-01	**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	7/20/20	7/20/20 13:47	361870	688323	

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: HS20070400
Sample Matrix: Ground Water

Service Request: E2000627
Date Analyzed: 7/20/20

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: 361870

	Lab Control Sample EQ2000302-02			Duplicate Lab Control Sample EQ2000302-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.102	0.100	102	0.117	0.100	117	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:**	E2000627
Project:	HS20070400	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000302-02	**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	**0.102**		0.100	0.0500	0.0250	1	7/20/20	7/20/20 13:55	361870	688323	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000302-03	**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	**0.117**		0.100	0.0500	0.0250	1	7/20/20	7/20/20 14:03	361870	688323	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Collected:**	7/9/20
Sample Matrix:	Ground Water	**Date Received:**	7/10/20
		Date Analyzed:	7/24/20

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	50WW14-200709	**Units:**	µg/L
Lab Code:	E2000627-004	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		50WW14-200709MS				50WW14-200709DMS					
		Matrix Spike				**Duplicate Matrix Spike**					
		EQ2000302-04				EQ2000302-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	3.69	4.69	1.00	99	4.79	1.00	110	84 - 119	2	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:**	E2000627
Project:	HS20070400	**Date Collected:**	7/ 9/20 0740
Sample Matrix:	Ground Water	**Date Received:**	7/10/20
Sample Name:	50WW14-200709	**Units:**	µg/L
Lab Code:	EQ2000302-04	**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	**4.69**		1.00	0.500	0.250	10	7/20/20	7/24/20 14:07	361870	688371	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Collected:**	7/ 9/20 0740
Sample Matrix:	Ground Water	**Date Received:**	7/10/20
Sample Name:	50WW14-200709	**Units:**	µg/L
Lab Code:	EQ2000302-05	**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	**4.79**		1.00	0.500	0.250	10	7/20/20	7/24/20 15:45	361870	688371	

Initial Calibration

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20200720

1st Review: Kneir
2nd Review: Hvan

ALS Environmental

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 7/20/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000014**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments
1	PERCHLORATE1		20200720_006	Perchlorate6850b.lcm	1x	☒	3100806-05
2	PERCHLORATE2		20200720_007	Perchlorate6850b.lcm	1x	☒	3100806-06
3	PERCHLORATE3		20200720_008	Perchlorate6850b.lcm	1x	☒	3100806-07
4	PERCHLORATE4		20200720_009	Perchlorate6850b.lcm	1x	☒	3100807-01
5	PERCHLORATE5		20200720_016	Perchlorate6850b.lcm	1x	☒	3100807-02
6	PERCHLORATE6		20200720_011	Perchlorate6850b.lcm	1x	☒	3100807-03
7	PERCHLORATE7		20200720_012	Perchlorate6850b.lcm	1x	☒	3100807-04
8	PERCHLORATE8		20200720_013	Perchlorate6850b.lcm	1x	☒	3100807-05
9	PERCHLORATE9		20200720_014	Perchlorate6850b.lcm	1x	☒	3100807-06
10	PERCHLORATE10		20200720_015	Perchlorate6850b.lcm	1x	☒	3100807-07
11	PERCHLORATEICV		20200720_017	Perchlorate6850b.lcm	1x	☒	3100807-08
12	IB		20200720_018	Perchlorate6850b.lcm	1x	☒	
13	IB		20200720_019	Perchlorate6850b.lcm	1x	☒	
14	LODV		20200720_020	Perchlorate6850b.lcm	1x	☒	
15	ICS		20200720_021	Perchlorate6850b.lcm	1x	☒	
16	PERCHLORATE7		20200720_022	Perchlorate6850b.lcm	1x	☒	3100807-04
17	EQ2000302-01		20200720_023	Perchlorate6850b.lcm	1x	☒	
18	EQ2000302-02		20200720_024	Perchlorate6850b.lcm	1x	☒	
19	EQ2000302-03		20200720_025	Perchlorate6850b.lcm	1x	☒	
20	EQ2000302-04		20200720_026	Perchlorate6850b.lcm	1x	☒	
21	EQ2000302-05		20200720_027	Perchlorate6850b.lcm	1x	☒	
22	E2000626-001		20200720_028	Perchlorate6850b.lcm	1x	☒	
23	E2000627-001		20200720_029	Perchlorate6850b.lcm	1x	☒	
24	E2000627-002		20200720_030	Perchlorate6850b.lcm	1x	☒	
25	E2000627-003		20200720_031	Perchlorate6850b.lcm	1x	☒	
26	E2000627-004		20200720_032	Perchlorate6850b.lcm	1x	☒	
27	PERCHLORATE7		20200720_033	Perchlorate6850b.lcm	1x	☒	3100807-04
28	E2000627-005		20200720_034	Perchlorate6850b.lcm	1x	☒	
29	E2000627-006		20200720_035	Perchlorate6850b.lcm	1x	☒	
30	E2000627-007		20200720_036	Perchlorate6850b.lcm	1x	☒	
31	E2000627-008		20200720_037	Perchlorate6850b.lcm	1x	☒	
32	E2000627-009		20200720_038	Perchlorate6850b.lcm	1x	☒	
33	E2000638-001		20200720_039	Perchlorate6850b.lcm	1x	☒	
34	E2000639-001		20200720_040	Perchlorate6850b.lcm	1x	☒	
35	E2000640-001		20200720_041	Perchlorate6850b.lcm	1x	☒	
36	PERCHLORATE7		20200720_042	Perchlorate6850b.lcm	1x	☒	3100807-04
37	EQ2000303-01		20200720_043	Perchlorate6850b.lcm	1x	☒	
38	EQ2000303-02		20200720_044	Perchlorate6850b.lcm	1x	☒	
39	EQ2000303-03		20200720_045	Perchlorate6850b.lcm	1x	☒	
40	E2000641-001		20200720_046	Perchlorate6850b.lcm	1x	☒	
41	E2000641-002		20200720_047	Perchlorate6850b.lcm	1x	☒	
42	E2000641-003		20200720_048	Perchlorate6850b.lcm	1x	☒	
43	E2000641-004		20200720_049	Perchlorate6850b.lcm	1x	☒	
44	E2000641-005		20200720_050	Perchlorate6850b.lcm	1x	☒	
45	E2000641-006		20200720_051	Perchlorate6850b.lcm	1x	☒	
46	E2000641-007		20200720_052	Perchlorate6850b.lcm	1x	☒	
47	PERCHLORATE7		20200720_053	Perchlorate6850b.lcm	1x	☒	3100807-04
48	E2000641-008		20200720_054	Perchlorate6850b.lcm	1x	☒	
49	E2000641-009		20200720_055	Perchlorate6850b.lcm	1x	☒	
50	E2000648-001		20200720_056	Perchlorate6850b.lcm	1x	☒	
51	E2000648-002		20200720_057	Perchlorate6850b.lcm	1x	☒	
52	E2000648-003		20200720_058	Perchlorate6850b.lcm	1x	☒	

Initial Calibration - Detailed Report

Calibration ID: EC2000014 **Instrument ID:** E-LCMS-01
Column Name: 1

#	Lab Code	Sample Name	File Location	Aquisition Date
01	EC2000014-01	PERCHLORATE1	20200720_006	07/20/2020 10:09
02	EC2000014-02	PERCHLORATE2	20200720_007	07/20/2020 10:17
03	EC2000014-03	PERCHLORATE3	20200720_008	07/20/2020 10:24
04	EC2000014-04	PERCHLORATE4	20200720_009	07/20/2020 10:32
06	EC2000014-06	PERCHLORATE6	20200720_011	07/20/2020 10:48
07	EC2000014-07	PERCHLORATE7	20200720_012	07/20/2020 10:56
08	EC2000014-08	PERCHLORATE8	20200720_013	07/20/2020 11:04
09	EC2000014-09	PERCHLORATE9	20200720_014	07/20/2020 11:12
10	EC2000014-10	PERCHLORATE10	20200720_015	07/20/2020 11:20
05	EC2000014-05	PERCHLORATE5	20200720_016	07/20/2020 12:28

Analyte **Curve Fit** **Weighting**

Perchlorate **Average RF** **RSD = 3.545** **Average RF = 0.121**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.1000	0.1239	02	0.5000	0.1227	03	0.7000	0.1244	04	1.0000	0.1237
05	2.0000	0.1208	06	5.0000	0.1169	07	10.0000	0.1279	08	20.0000	0.1185
09	30.0000	0.1182	10	50.0000	0.1134						

Analyte

Perchlorate

#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D
01	0.1000	0.102	2.3	02	0.5000	0.507	1.4	03	0.7000	0.719	2.7
04	1.0000	1.02	2.2	05	2.0000	2.00	-0.2	06	5.0000	4.83	-3.4
07	10.0000	10.6	5.7	08	20.0000	19.6	-2.1	09	30.0000	29.3	-2.3
10	50.0000	46.8	-6.3								

Initial Calibration Verification Summary Report

Calibration ID:	EC2000014	**Instrument ID:**	E-LCMS-01
Datafile ID:	20200720_017	**Column Name:**	1

Analyte	Lab Code	Type	Curve Fit	True Value	Calc Conc	Units	Result	Criteria
Perchlorate	EC2000014-11	T	Average RF	10	10.475	ng/mL	4.8	<= 15

ALS Group Houston

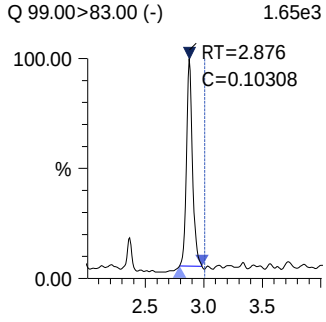
PERCHLORATE1

Date acquired: 7/20/2020 10:09:08 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200720\20200720_006.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE1	7/20/2020 10:09:08 AM	5665	0.10308	20200720_006	2.876	25.0000	1.0000	5
Sodium Perchlorate-18O4_IS	PERCHLORATE1	7/20/2020 10:09:08 AM	457293	1.00000	20200720_006	2.874	25.0000	1.0000	5

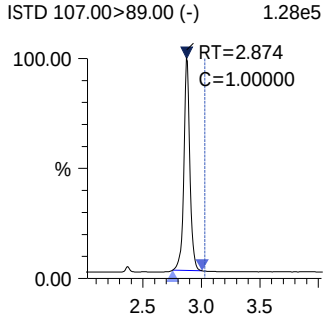
Perchlorate

Conc 0.10308
Area 5665



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 457293



ALS Group Houston

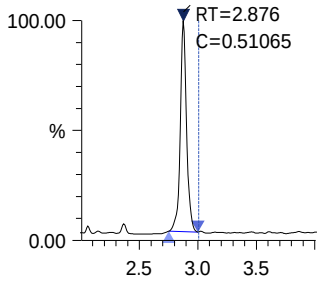
PERCHLORATE2

Date acquired: 7/20/2020 10:17:03 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200720\20200720_007.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE2	7/20/2020 10:17:03 AM	28211	0.51065	20200720_007	2.876	25.0000	1.0000	6
Sodium Perchlorate-18O4_IS	PERCHLORATE2	7/20/2020 10:17:03 AM	459674	1.00000	20200720_007	2.873	25.0000	1.0000	6

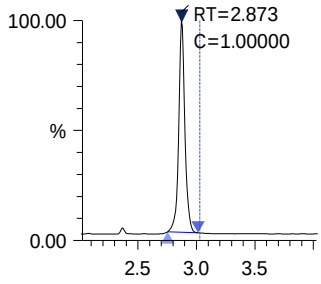
Perchlorate

Conc 0.51065
Area 28211
Q 99.00>83.00 (-) 7.64e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 459674
ISTD 107.00>89.00 (-) 1.26e5



ALS Group Houston

PERCHLORATE3

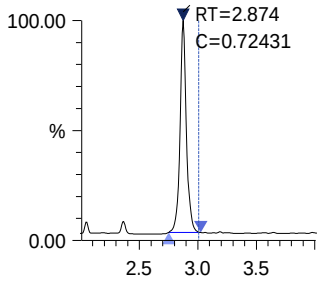
Date acquired: 7/20/2020 10:24:56 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200720\20200720_008.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE3	7/20/2020 10:24:56 AM	40510	0.72431	20200720_008	2.874	25.0000	1.0000	7
Sodium Perchlorate-18O4_IS	PERCHLORATE3	7/20/2020 10:24:56 AM	465371	1.00000	20200720_008	2.874	25.0000	1.0000	7

Perchlorate

Conc 0.72431
Area 40510

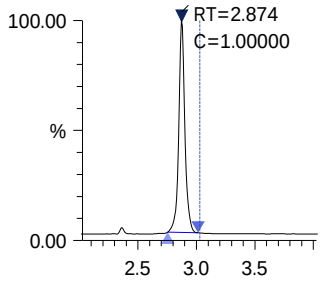
Q 99.00>83.00 (-) 1.08e4



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 465371

ISTD 107.00>89.00 (-) 1.27e5



ALS Group Houston

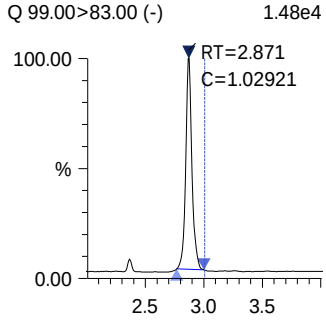
PERCHLORATE4

Date acquired: 7/20/2020 10:32:48 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200720\20200720_009.lcd
Vial: 8 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE4	7/20/2020 10:32:48 AM	54285	1.02921	20200720_009	2.871	25.0000	1.0000	8
Sodium Perchlorate-18O4_IS	PERCHLORATE4	7/20/2020 10:32:48 AM	438869	1.00000	20200720_009	2.869	25.0000	1.0000	8

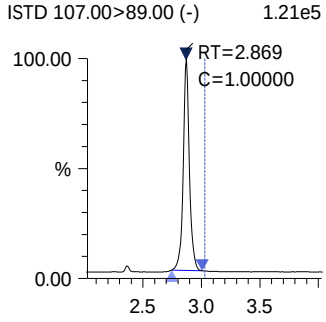
Perchlorate

Conc 1.02921
Area 54285



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 438869



ALS Group Houston

PERCHLORATE6

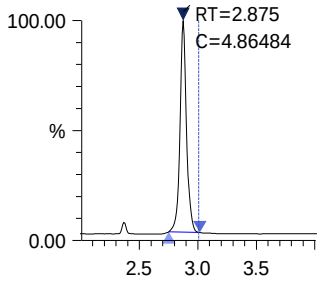
Date acquired: 7/20/2020 10:48:37 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200720\20200720_011.lcd
Vial: 10 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE6	7/20/2020 10:48:37 AM	249126	4.86484	20200720_011	2.875	25.0000	1.0000	10
Sodium Perchlorate-18O4_IS	PERCHLORATE6	7/20/2020 10:48:37 AM	426098	1.00000	20200720_011	2.873	25.0000	1.0000	10

Perchlorate

Conc 4.86484
Area 249126

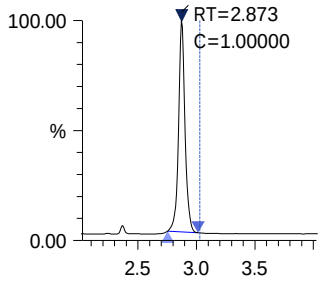
Q 99.00>83.00 (-) 6.50e4



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 426098

ISTD 107.00>89.00 (-) 1.12e5



ALS Group Houston

PERCHLORATE7

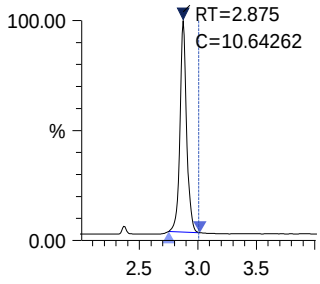
Date acquired: 7/20/2020 10:56:33 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200720\20200720_012.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	7/20/2020 10:56:33 AM	453181	10.64262	20200720_012	2.875	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	7/20/2020 10:56:33 AM	354309	1.00000	20200720_012	2.873	25.0000	1.0000	4

Perchlorate

Conc 10.64262
Area 453181

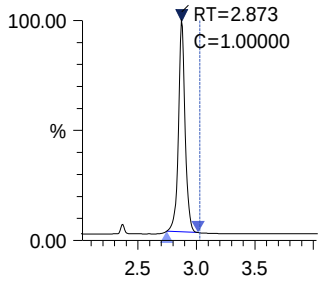
Q 99.00>83.00 (-) 1.16e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 354309

ISTD 107.00>89.00 (-) 9.03e4



ALS Group Houston

PERCHLORATE8

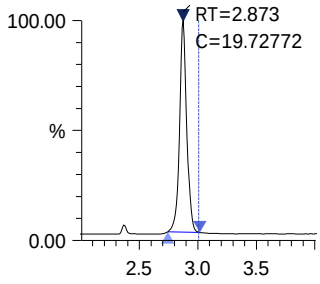
Date acquired: 7/20/2020 11:04:29 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200720\20200720_013.lcd
Vial: 11 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE8	7/20/2020 11:04:29 AM	811652	19.72772	20200720_013	2.873	25.0000	1.0000	11
Sodium Perchlorate-18O4_IS	PERCHLORATE8	7/20/2020 11:04:29 AM	342336	1.00000	20200720_013	2.872	25.0000	1.0000	11

Perchlorate

Conc 19.72772
Area 811652

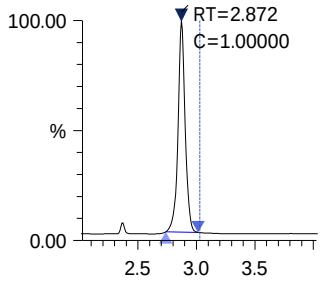
Q 99.00>83.00 (-) 1.93e5



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 342336

ISTD 107.00>89.00 (-) 8.10e4



ALS Group Houston

PERCHLORATE9

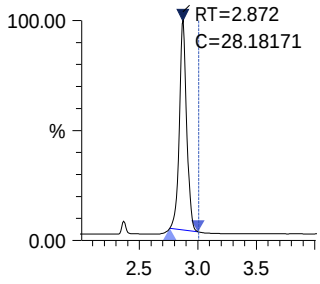
Date acquired: 7/20/2020 11:12:22 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200720\20200720_014.lcd
Vial: 12 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE9	7/20/2020 11:12:22 AM	1067782	28.18171	20200720_014	2.872	25.0000	1.0000	12
Sodium Perchlorate-18O4_IS	PERCHLORATE9	7/20/2020 11:12:22 AM	315264	1.00000	20200720_014	2.871	25.0000	1.0000	12

Perchlorate

Conc 28.18171
Area 1067782

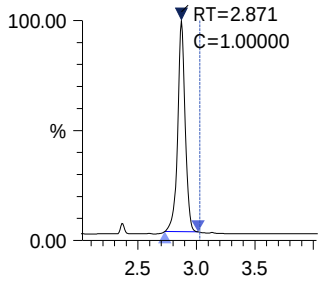
Q 99.00>83.00 (-) 2.52e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 315264

ISTD 107.00>89.00 (-) 7.16e4



ALS Group Houston

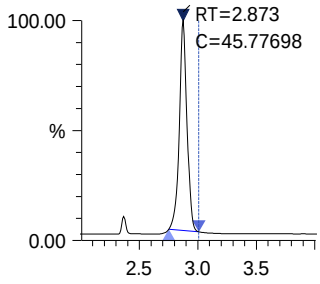
PERCHLORATE10

Date acquired: 7/20/2020 11:20:14 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200720\20200720_015.lcd
Vial: 13 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE10	7/20/2020 11:20:14 AM	1515028	45.77698	20200720_015	2.873	25.0000	1.0000	13
Sodium Perchlorate-18O4_IS	PERCHLORATE10	7/20/2020 11:20:14 AM	275380	1.00000	20200720_015	2.872	25.0000	1.0000	13

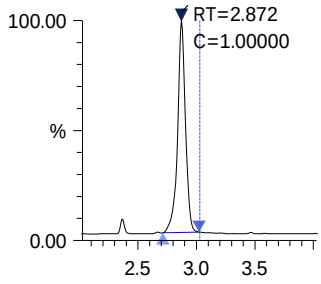
Perchlorate

Conc 45.77698
Area 1515028
Q 99.00>83.00 (-) 3.39e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 275380
ISTD 107.00>89.00 (-) 5.90e4



ALS Group Houston

PERCHLORATE5

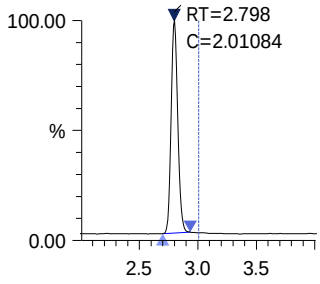
Date acquired: 7/20/2020 12:28:05 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200720\20200720_016.lcd
Vial: 9 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE5	7/20/2020 12:28:05 PM	119859	2.01084	20200720_016	2.798	25.0000	1.0000	9
Sodium Perchlorate-18O4_IS	PERCHLORATE5	7/20/2020 12:28:05 PM	495966	1.00000	20200720_016	2.795	25.0000	1.0000	9

Perchlorate

Conc 2.01084
Area 119859

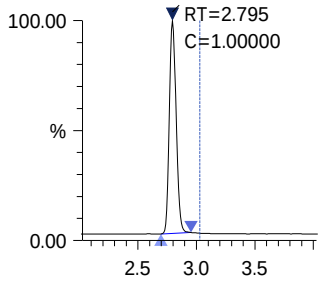
Q 99.00>83.00 (-) 3.02e4



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 495966

ISTD 107.00>89.00 (-) 1.24e5



ALS Group Houston

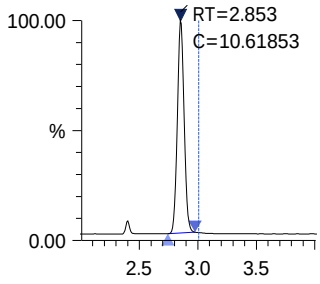
PERCHLORATEICV

Date acquired: 7/20/2020 12:52:26 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200720\20200720_017.lcd
Vial: 14 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATEICV	7/20/2020 12:52:26 PM	490921	10.61853	20200720_017	2.853	25.0000	1.0000	14
Sodium Perchlorate-18O4_IS	PERCHLORATEICV	7/20/2020 12:52:26 PM	384686	1.00000	20200720_017	2.851	25.0000	1.0000	14

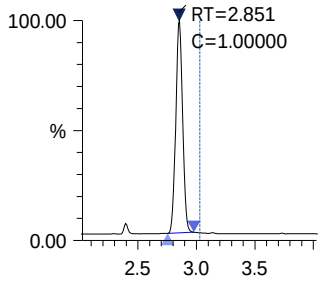
Perchlorate

Conc 10.61853
Area 490921
Q 99.00>83.00 (-) 1.21e5



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 384686
ISTD 107.00>89.00 (-) 9.52e4



20200724

ALS Environmental

1st Review: Kneir
2nd Review: Hvan

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 7/24/2020
Cal. Std. xp: 11/18/2020
ICAL ID: EC2000016

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments
1	PERCHLORATE1		20200724_005	Perchlorate6850b.lcm	1x	☒	3100806-05
2	PERCHLORATE2		20200724_006	Perchlorate6850b.lcm	1x	☒	3100806-06
3	PERCHLORATE3		20200724_007	Perchlorate6850b.lcm	1x	☒	3100806-07
4	PERCHLORATE4		20200724_008	Perchlorate6850b.lcm	1x	☒	3100807-01
5	PERCHLORATE5		20200724_009	Perchlorate6850b.lcm	1x	☒	3100807-02
6	PERCHLORATE6		20200724_010	Perchlorate6850b.lcm	1x	☒	3100807-03
7	PERCHLORATE7		20200724_011	Perchlorate6850b.lcm	1x	☒	3100807-04
8	PERCHLORATE8		20200724_012	Perchlorate6850b.lcm	1x	☒	3100807-05
9	PERCHLORATE9		20200724_013	Perchlorate6850b.lcm	1x	☒	3100807-06
10	PERCHLORATE10		20200724_014	Perchlorate6850b.lcm	1x	☒	3100807-07
11	IB		20200724_015	Perchlorate6850b.lcm	1x	☒	
12	PERCHLORATEICV		20200724_016	Perchlorate6850b.lcm	1x	☒	3100807-08
13	IB		20200724_017	Perchlorate6850b.lcm	1x	☒	
14	LODV		20200724_018	Perchlorate6850b.lcm	1x	☒	
15	ICS		20200724_019	Perchlorate6850b.lcm	1x	☒	
16	PERCHLORATE7		20200724_020	Perchlorate6850b.lcm	1x	☒	3100807-04
17	EQ2000302-04X10		20200724_021	Perchlorate6850b.lcm	10x	☒	
18	EQ2000302-05X10DNU		20200724_022	Perchlorate6850b.lcm	10x	☒	
19	E2000626-001X2		20200724_023	Perchlorate6850b.lcm	2x	☒	
20	E2000627-001X10		20200724_024	Perchlorate6850b.lcm	10x	☒	
21	E2000627-005X100		20200724_025	Perchlorate6850b.lcm	100x	☒	
22	E2000627-006X100		20200724_026	Perchlorate6850b.lcm	100x	☒	
23	E2000627-009X1000		20200724_027	Perchlorate6850b.lcm	1000x	☒	
24	E2000640-001X200		20200724_028	Perchlorate6850b.lcm	200x	☒	
25	PERCHLORATE7		20200724_029	Perchlorate6850b.lcm	1x	☒	3100807-04
26	E2000660-001X10		20200724_030	Perchlorate6850b.lcm	10x	☒	
27	E2000627-004X10		20200724_031	Perchlorate6850b.lcm	10x	☒	
28	PERCHLORATE7		20200724_032	Perchlorate6850b.lcm	1x	☒	3100807-04
29	EQ2000302-05X10		20200724_033	Perchlorate6850b.lcm	10x	☒	
30	PERCHLORATE7		20200724_034	Perchlorate6850b.lcm	1x	☒	3100807-04
31							
32							
33							
34							
35							
36							
37							
38							

Initial Calibration - Detailed Report

Calibration ID: EC2000016 **Instrument ID:** E-LCMS-01
Column Name: 1

#	Lab Code	Sample Name	File Location	Aquisition Date
01	EC2000016-01	PERCHLORATE1	20200724_005	07/24/2020 11:48
02	EC2000016-02	PERCHLORATE2	20200724_006	07/24/2020 11:56
03	EC2000016-03	PERCHLORATE3	20200724_007	07/24/2020 12:04
04	EC2000016-04	PERCHLORATE4	20200724_008	07/24/2020 12:11
05	EC2000016-05	PERCHLORATE5	20200724_009	07/24/2020 12:19
06	EC2000016-06	PERCHLORATE6	20200724_010	07/24/2020 12:27
07	EC2000016-07	PERCHLORATE7	20200724_011	07/24/2020 12:35
08	EC2000016-08	PERCHLORATE8	20200724_012	07/24/2020 12:43
09	EC2000016-09	PERCHLORATE9	20200724_013	07/24/2020 12:51
10	EC2000016-10	PERCHLORATE10	20200724_014	07/24/2020 12:59

Analyte **Curve Fit** **Weighting**

Perchlorate **Average RF** **RSD = 4.659** **Average RF = 0.121**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.1000	0.1283	02	0.5000	0.13	03	0.7000	0.1207	04	1.0000	0.1251
05	2.0000	0.1211	06	5.0000	0.1202	07	10.0000	0.1211	08	20.0000	0.1168
09	30.0000	0.1121	10	50.0000	0.1148						

Analyte

Perchlorate

#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D
01	0.1000	0.106	6.0	02	0.5000	0.537	7.4	03	0.7000	0.698	-0.3
04	1.0000	1.03	3.4	05	2.0000	2.00	0.1	06	5.0000	4.97	-0.7
07	10.0000	10.0	0.1	08	20.0000	19.3	-3.5	09	30.0000	27.8	-7.3
10	50.0000	47.4	-5.1								

Initial Calibration Verification Summary Report

Calibration ID:	EC2000016	**Instrument ID:**	E-LCMS-01
Datafile ID:	20200724_016	**Column Name:**	1

Analyte	Lab Code	Type	Curve Fit	True Value	Calc Conc	Units	Result	Criteria
Perchlorate	EC2000016-11	T	Average RF	10	9.867	ng/mL	-1.3	<= 15

ALS Group Houston

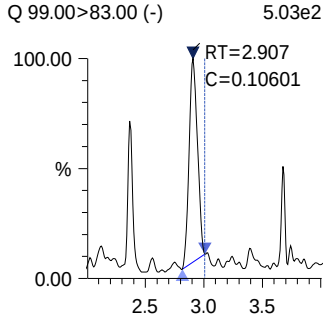
PERCHLORATE1

Date acquired: 7/24/2020 11:48:19 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200724\20200724_005.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE1	7/24/2020 11:48:19 AM	2348	0.10601	20200724_005	2.907	25.0000	1.0000	5
Sodium Perchlorate-18O4_IS	PERCHLORATE1	7/24/2020 11:48:19 AM	183001	1.00000	20200724_005	2.903	25.0000	1.0000	5

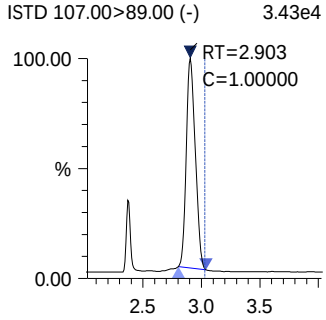
Perchlorate

Conc 0.10601
Area 2348



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 183001



ALS Group Houston

PERCHLORATE2

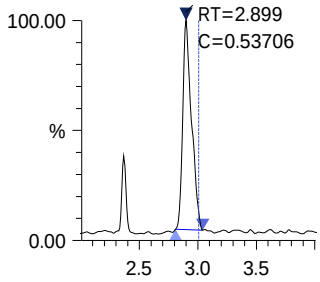
Date acquired: 7/24/2020 11:56:11 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200724\20200724_006.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE2	7/24/2020 11:56:11 AM	11773	0.53706	20200724_006	2.899	25.0000	1.0000	6
Sodium Perchlorate-18O4_IS	PERCHLORATE2	7/24/2020 11:56:11 AM	181125	1.00000	20200724_006	2.898	25.0000	1.0000	6

Perchlorate

Conc 0.53706
Area 11773

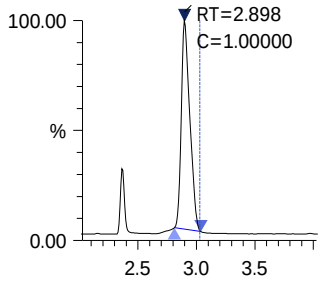
Q 99.00>83.00 (-) 2.32e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 181125

ISTD 107.00>89.00 (-) 3.62e4



ALS Group Houston

PERCHLORATE3

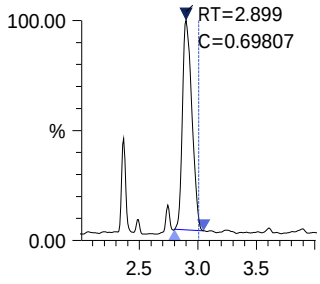
Date acquired: 7/24/2020 12:04:05 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200724\20200724_007.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE3	7/24/2020 12:04:05 PM	15258	0.69807	20200724_007	2.899	25.0000	1.0000	7
Sodium Perchlorate-18O4_IS	PERCHLORATE3	7/24/2020 12:04:05 PM	180602	1.00000	20200724_007	2.896	25.0000	1.0000	7

Perchlorate

Conc 0.69807
Area 15258

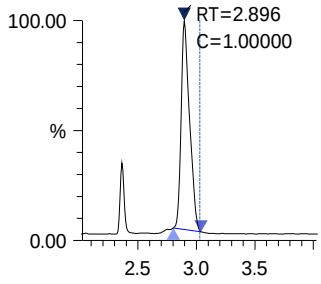
Q 99.00>83.00 (-) 2.79e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 180602

ISTD 107.00>89.00 (-) 3.65e4



ALS Group Houston

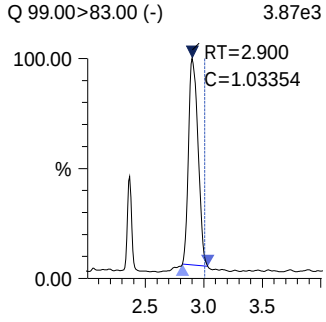
PERCHLORATE4

Date acquired: 7/24/2020 12:11:58 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200724\20200724_008.lcd
Vial: 8 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE4	7/24/2020 12:11:58 PM	20922	1.03354	20200724_008	2.900	25.0000	1.0000	8
Sodium Perchlorate-18O4_IS	PERCHLORATE4	7/24/2020 12:11:58 PM	167260	1.00000	20200724_008	2.902	25.0000	1.0000	8

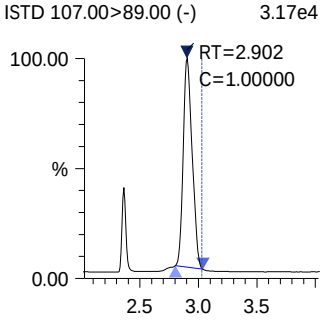
Perchlorate

Conc 1.03354
Area 20922



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 167260



ALS Group Houston

PERCHLORATE5

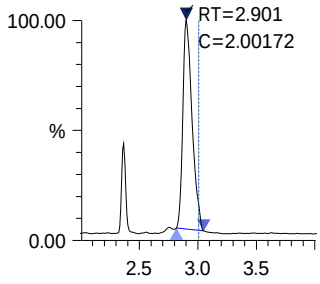
Date acquired: 7/24/2020 12:19:50 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200724\20200724_009.lcd
Vial: 9 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE5	7/24/2020 12:19:50 PM	39343	2.00172	20200724_009	2.901	25.0000	1.0000	9
Sodium Perchlorate-18O4_IS	PERCHLORATE5	7/24/2020 12:19:50 PM	162397	1.00000	20200724_009	2.899	25.0000	1.0000	9

Perchlorate

Conc 2.00172
Area 39343

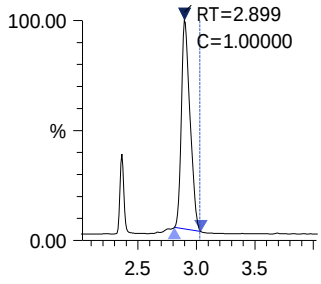
Q 99.00>83.00 (-) 7.39e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 162397

ISTD 107.00>89.00 (-) 3.19e4



ALS Group Houston

PERCHLORATE6

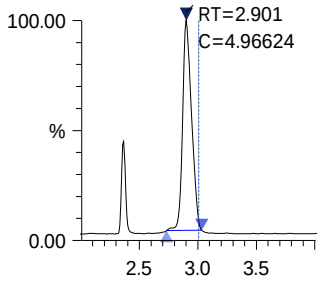
Date acquired: 7/24/2020 12:27:42 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200724\20200724_010.lcd
Vial: 10 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE6	7/24/2020 12:27:42 PM	102216	4.96624	20200724_010	2.901	25.0000	1.0000	10
Sodium Perchlorate-18O4_IS	PERCHLORATE6	7/24/2020 12:27:42 PM	170060	1.00000	20200724_010	2.900	25.0000	1.0000	10

Perchlorate

Conc 4.96624
Area 102216

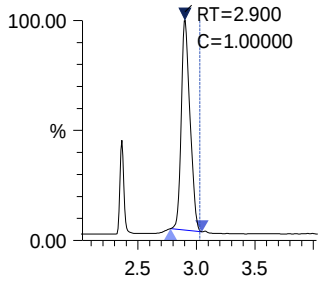
Q 99.00>83.00 (-) 1.97e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 170060

ISTD 107.00>89.00 (-) 3.28e4



ALS Group Houston

PERCHLORATE7

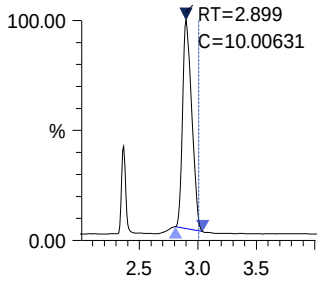
Date acquired: 7/24/2020 12:35:33 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200724\20200724_011.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	7/24/2020 12:35:33 PM	187110	10.00631	20200724_011	2.899	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	7/24/2020 12:35:33 PM	154502	1.00000	20200724_011	2.897	25.0000	1.0000	4

Perchlorate

Conc 10.00631
Area 187110

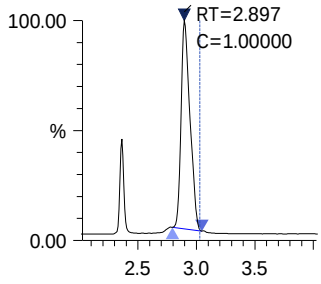
Q 99.00>83.00 (-) 3.54e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 154502

ISTD 107.00>89.00 (-) 2.97e4



ALS Group Houston

PERCHLORATE8

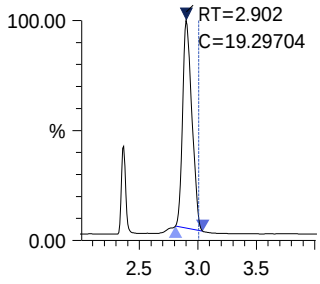
Date acquired: 7/24/2020 12:43:26 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200724\20200724_012.lcd
Vial: 11 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE8	7/24/2020 12:43:26 PM	349524	19.29704	20200724_012	2.902	25.0000	1.0000	11
Sodium Perchlorate-18O4_IS	PERCHLORATE8	7/24/2020 12:43:26 PM	149657	1.00000	20200724_012	2.900	25.0000	1.0000	11

Perchlorate

Conc 19.29704
Area 349524

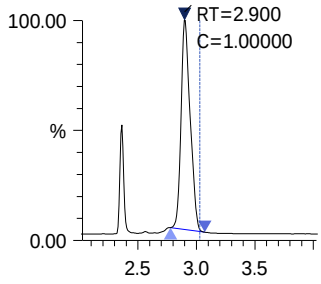
Q 99.00>83.00 (-) 6.58e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 149657

ISTD 107.00>89.00 (-) 2.78e4



ALS Group Houston

PERCHLORATE9

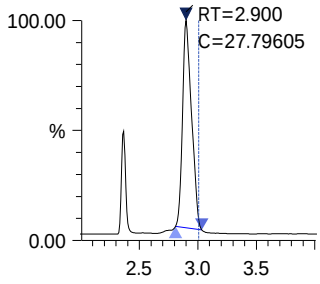
Date acquired: 7/24/2020 12:51:22 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200724\20200724_013.lcd
Vial: 12 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE9	7/24/2020 12:51:22 PM	465757	27.79605	20200724_013	2.900	25.0000	1.0000	12
Sodium Perchlorate-18O4_IS	PERCHLORATE9	7/24/2020 12:51:22 PM	138448	1.00000	20200724_013	2.898	25.0000	1.0000	12

Perchlorate

Conc 27.79605
Area 465757

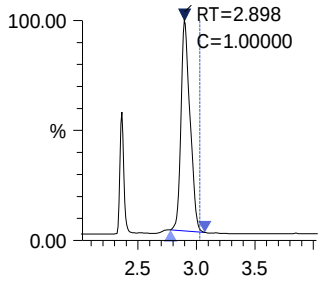
Q 99.00>83.00 (-) 9.05e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 138448

ISTD 107.00>89.00 (-) 2.59e4



ALS Group Houston

PERCHLORATE10

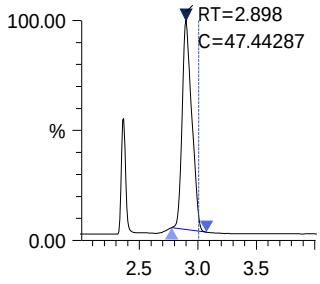
Date acquired: 7/24/2020 12:59:14 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200724\20200724_014.lcd
Vial: 13 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE10	7/24/2020 12:59:14 PM	708682	47.44287	20200724_014	2.898	25.0000	1.0000	13
Sodium Perchlorate-18O4_IS	PERCHLORATE10	7/24/2020 12:59:14 PM	123422	1.00000	20200724_014	2.896	25.0000	1.0000	13

Perchlorate

Conc 47.44287
Area 708682

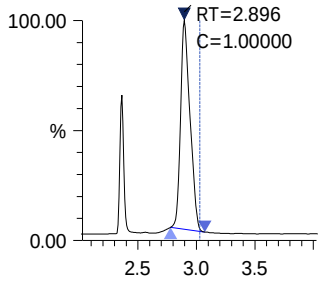
Q 99.00>83.00 (-) 1.28e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 123422

ISTD 107.00>89.00 (-) 2.23e4



ALS Group Houston

PERCHLORATEICV

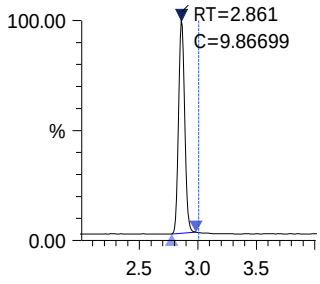
Date acquired: 7/24/2020 1:28:19 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200724\20200724_016.lcd
Vial: 14 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATEICV	7/24/2020 1:28:19 PM	231631	9.86699	20200724_016	2.861	25.0000	1.0000	14
Sodium Perchlorate-18O4_IS	PERCHLORATEICV	7/24/2020 1:28:19 PM	193964	1.00000	20200724_016	2.859	25.0000	1.0000	14

Perchlorate

Conc 9.86699
Area 231631

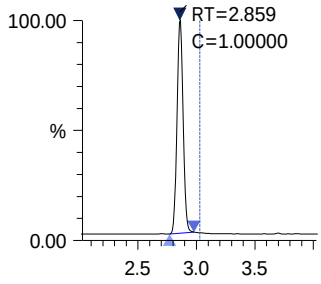
Q 99.00>83.00 (-) 6.30e4



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 193964

ISTD 107.00>89.00 (-) 5.33e4



Chromatograms and Selected Ion Monitoring

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 320, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20200720

ALS Environmental

1st Review: Kneir
2nd Review: Hvan

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 7/20/2020
Cal. Std. xp: 11/18/2020
ICAL ID: EC2000014

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments
1	PERCHLORATE1		20200720_006	Perchlorate6850b.lcm	1x	☒	3100806-05
2	PERCHLORATE2		20200720_007	Perchlorate6850b.lcm	1x	☒	3100806-06
3	PERCHLORATE3		20200720_008	Perchlorate6850b.lcm	1x	☒	3100806-07
4	PERCHLORATE4		20200720_009	Perchlorate6850b.lcm	1x	☒	3100807-01
5	PERCHLORATE5		20200720_016	Perchlorate6850b.lcm	1x	☒	3100807-02
6	PERCHLORATE6		20200720_011	Perchlorate6850b.lcm	1x	☒	3100807-03
7	PERCHLORATE7		20200720_012	Perchlorate6850b.lcm	1x	☒	3100807-04
8	PERCHLORATE8		20200720_013	Perchlorate6850b.lcm	1x	☒	3100807-05
9	PERCHLORATE9		20200720_014	Perchlorate6850b.lcm	1x	☒	3100807-06
10	PERCHLORATE10		20200720_015	Perchlorate6850b.lcm	1x	☒	3100807-07
11	PERCHLORATEICV		20200720_017	Perchlorate6850b.lcm	1x	☒	3100807-08
12	IB		20200720_018	Perchlorate6850b.lcm	1x	☒	
13	IB		20200720_019	Perchlorate6850b.lcm	1x	☒	
14	LODV		20200720_020	Perchlorate6850b.lcm	1x	☒	
15	ICS		20200720_021	Perchlorate6850b.lcm	1x	☒	
16	PERCHLORATE7		20200720_022	Perchlorate6850b.lcm	1x	☒	3100807-04
17	EQ2000302-01		20200720_023	Perchlorate6850b.lcm	1x	☒	
18	EQ2000302-02		20200720_024	Perchlorate6850b.lcm	1x	☒	
19	EQ2000302-03		20200720_025	Perchlorate6850b.lcm	1x	☒	
20	EQ2000302-04		20200720_026	Perchlorate6850b.lcm	1x	☒	
21	EQ2000302-05		20200720_027	Perchlorate6850b.lcm	1x	☒	
22	E2000626-001		20200720_028	Perchlorate6850b.lcm	1x	☒	
23	E2000627-001		20200720_029	Perchlorate6850b.lcm	1x	☒	
24	E2000627-002		20200720_030	Perchlorate6850b.lcm	1x	☒	
25	E2000627-003		20200720_031	Perchlorate6850b.lcm	1x	☒	
26	E2000627-004		20200720_032	Perchlorate6850b.lcm	1x	☒	
27	PERCHLORATE7		20200720_033	Perchlorate6850b.lcm	1x	☒	3100807-04
28	E2000627-005		20200720_034	Perchlorate6850b.lcm	1x	☒	
29	E2000627-006		20200720_035	Perchlorate6850b.lcm	1x	☒	
30	E2000627-007		20200720_036	Perchlorate6850b.lcm	1x	☒	
31	E2000627-008		20200720_037	Perchlorate6850b.lcm	1x	☒	
32	E2000627-009		20200720_038	Perchlorate6850b.lcm	1x	☒	
33	E2000638-001		20200720_039	Perchlorate6850b.lcm	1x	☒	
34	E2000639-001		20200720_040	Perchlorate6850b.lcm	1x	☒	
35	E2000640-001		20200720_041	Perchlorate6850b.lcm	1x	☒	
36	PERCHLORATE7		20200720_042	Perchlorate6850b.lcm	1x	☒	3100807-04
37	EQ2000303-01		20200720_043	Perchlorate6850b.lcm	1x	☒	
38	EQ2000303-02		20200720_044	Perchlorate6850b.lcm	1x	☒	
39	EQ2000303-03		20200720_045	Perchlorate6850b.lcm	1x	☒	
40	E2000641-001		20200720_046	Perchlorate6850b.lcm	1x	☒	
41	E2000641-002		20200720_047	Perchlorate6850b.lcm	1x	☒	
42	E2000641-003		20200720_048	Perchlorate6850b.lcm	1x	☒	
43	E2000641-004		20200720_049	Perchlorate6850b.lcm	1x	☒	
44	E2000641-005		20200720_050	Perchlorate6850b.lcm	1x	☒	
45	E2000641-006		20200720_051	Perchlorate6850b.lcm	1x	☒	
46	E2000641-007		20200720_052	Perchlorate6850b.lcm	1x	☒	
47	PERCHLORATE7		20200720_053	Perchlorate6850b.lcm	1x	☒	3100807-04
48	E2000641-008		20200720_054	Perchlorate6850b.lcm	1x	☒	
49	E2000641-009		20200720_055	Perchlorate6850b.lcm	1x	☒	
50	E2000648-001		20200720_056	Perchlorate6850b.lcm	1x	☒	
51	E2000648-002		20200720_057	Perchlorate6850b.lcm	1x	☒	
52	E2000648-003		20200720_058	Perchlorate6850b.lcm	1x	☒	

20200722

ALS Environmental

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 7/20/2020
Cal. Std. xp: 11/18/2020
ICAL ID: EC2000014

1st Review: Kneir
2nd Review: Hvan

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments
1	null		20200722_001	Perchlorate6850b.lcm	1x	☒	
2	null		20200722_002	Perchlorate6850b.lcm	1x	☒	
3	IB		20200722_003	Perchlorate6850b.lcm	1x	☒	
4	IB		20200722_004	Perchlorate6850b.lcm	1x	☒	
5	IB		20200722_005	Perchlorate6850b.lcm	1x	☒	
6	LODV		20200722_006	Perchlorate6850b.lcm	1x	☒	
7	ICS		20200722_007	Perchlorate6850b.lcm	1x	☒	
8	PERCHLORATE7		20200722_008	Perchlorate6850b.lcm	1x	☒	3100807-04
9	EQ2000302-04		20200722_009	Perchlorate6850b.lcm	1x	☒	
10	EQ2000302-05		20200722_010	Perchlorate6850b.lcm	1x	☒	
11	E2000626-001		20200722_011	Perchlorate6850b.lcm	1x	☒	
12	E2000627-001X2		20200722_012	Perchlorate6850b.lcm	2x	☒	
13	E2000627-002		20200722_013	Perchlorate6850b.lcm	1x	☒	
14	E2000627-003		20200722_014	Perchlorate6850b.lcm	1x	☒	
15	E2000627-004		20200722_015	Perchlorate6850b.lcm	1x	☒	
16	PERCHLORATE7		20200722_016	Perchlorate6850b.lcm	1x	☒	3100807-04
17	E2000627-005X100		20200722_017	Perchlorate6850b.lcm	100x	☒	
18	E2000627-006X100		20200722_018	Perchlorate6850b.lcm	100x	☒	
19	E2000627-007X200		20200722_019	Perchlorate6850b.lcm	200x	☒	
20	E2000627-009X1000		20200722_020	Perchlorate6850b.lcm	1000x	☒	
21	E2000638-001		20200722_021	Perchlorate6850b.lcm	1x	☒	
22	E2000639-001		20200722_022	Perchlorate6850b.lcm	1x	☒	
23	E2000640-001X200		20200722_023	Perchlorate6850b.lcm	200x	☒	
24	PERCHLORATE7		20200722_024	Perchlorate6850b.lcm	1x	☒	3100807-04
25	E2000649-001		20200722_025	Perchlorate6850b.lcm	1x	☒	
26	E2000649-003		20200722_026	Perchlorate6850b.lcm	1x	☒	
27	E2000649-004		20200722_027	Perchlorate6850b.lcm	1x	☒	
28	E2000649-005		20200722_028	Perchlorate6850b.lcm	1x	☒	
29	E2000649-006		20200722_029	Perchlorate6850b.lcm	1x	☒	
30	PERCHLORATE7		20200722_030	Perchlorate6850b.lcm	1x	☒	3100807-04
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
41							
42							
43							
44							
45							
46							
47							
48							
49							
50							
51							
52							

20200723

ALS Environmental

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 7/20/2020
Cal. Std. xp: 11/18/2020
ICAL ID: EC2000014

1st Review: Kneir
2nd Review: Hvan

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments
1	null		20200723_001	Perchlorate6850b.lcm	1x	☒	
2	null		20200723_002	Perchlorate6850b.lcm	1x	☒	
3	IB		20200723_003	Perchlorate6850b.lcm	1x	☒	
4	IB		20200723_004	Perchlorate6850b.lcm	1x	☒	
5	LODV		20200723_005	Perchlorate6850b.lcm	1x	☒	
6	ICS		20200723_006	Perchlorate6850b.lcm	1x	☒	
7	PERCHLORATE7		20200723_007	Perchlorate6850b.lcm	1x	☒	3100807-04
8	EQ2000302-04X2		20200723_008	Perchlorate6850b.lcm	1x	☒	
9	EQ2000302-05X2		20200723_009	Perchlorate6850b.lcm	1x	☒	
10	E2000626-001X2		20200723_010	Perchlorate6850b.lcm	1x	☒	
11	E2000627-001X10		20200723_011	Perchlorate6850b.lcm	1x	☒	
12	E2000627-002X10		20200723_012	Perchlorate6850b.lcm	2x	☒	
13	E2000627-003X10		20200723_013	Perchlorate6850b.lcm	1x	☒	
14	E2000627-004X10		20200723_014	Perchlorate6850b.lcm	1x	☒	
15	E2000638-001X10		20200723_015	Perchlorate6850b.lcm	1x	☒	
16	E2000639-001X10		20200723_016	Perchlorate6850b.lcm	1x	☒	
17	PERCHLORATE7		20200723_017	Perchlorate6850b.lcm	100x	☒	3100807-04
18	E2000649-001X10		20200723_018	Perchlorate6850b.lcm	100x	☒	
19	E2000649-003X10		20200723_019	Perchlorate6850b.lcm	200x	☒	
20	E2000649-004X10		20200723_020	Perchlorate6850b.lcm	1000x	☒	
21	E2000649-005X2		20200723_021	Perchlorate6850b.lcm	1x	☒	
22	E2000649-006X10		20200723_022	Perchlorate6850b.lcm	1x	☒	
23	PERCHLORATE7		20200723_023	Perchlorate6850b.lcm	200x	☒	3100807-04
24	E2000641-001X20		20200723_024	Perchlorate6850b.lcm	1x	☒	
25	E2000641-002X20		20200723_025	Perchlorate6850b.lcm	1x	☒	
26	E2000641-003X10		20200723_026	Perchlorate6850b.lcm	1x	☒	
27	E2000641-004X20		20200723_027	Perchlorate6850b.lcm	1x	☒	
28	E2000641-005X10		20200723_028	Perchlorate6850b.lcm	1x	☒	
29	E2000641-006X10		20200723_029	Perchlorate6850b.lcm	1x	☒	
30	E2000641-007X10		20200723_030	Perchlorate6850b.lcm	1x	☒	
31	E2000641-008X10		20200723_031	Perchlorate6850b.lcm	1x	☒	
32	E2000641-009X10		20200723_032	Perchlorate6850b.lcm	1x	☒	
33	PERCHLORATE7		20200723_033	Perchlorate6850b.lcm	1x	☒	3100807-04
34	E2000648-001X10		20200723_034	Perchlorate6850b.lcm	1x	☒	
35	E2000648-002X10		20200723_035	Perchlorate6850b.lcm	1x	☒	
36	E2000648-003X20		20200723_036	Perchlorate6850b.lcm	1x	☒	
37	E2000648-005X10		20200723_037	Perchlorate6850b.lcm	1x	☒	
38	E2000648-006X10		20200723_038	Perchlorate6850b.lcm	1x	☒	
39	E2000648-007X10		20200723_039	Perchlorate6850b.lcm	1x	☒	
40	E2000648-008X20		20200723_040	Perchlorate6850b.lcm	1x	☒	
41	E2000649-005X10		20200723_041	Perchlorate6850b.lcm	1x	☒	
42	EQ2000302-04X10		20200723_042	Perchlorate6850b.lcm	1x	☒	
43	EQ2000302-05X10		20200723_043	Perchlorate6850b.lcm	1x	☒	
44	E2000626-001X10		20200723_044	Perchlorate6850b.lcm	1x	☒	
45	PERCHLORATE7		20200723_045	Perchlorate6850b.lcm	1x	☒	3100807-04
46							
47							
48							
49							
50							
51							
52							

20200724

ALS Environmental

1st Review: Kneir
2nd Review: Hvan

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 7/24/2020
Cal. Std. xp: 11/18/2020
ICAL ID: EC2000016

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments
1	PERCHLORATE1		20200724_005	Perchlorate6850b.lcm	1x	☒	3100806-05
2	PERCHLORATE2		20200724_006	Perchlorate6850b.lcm	1x	☒	3100806-06
3	PERCHLORATE3		20200724_007	Perchlorate6850b.lcm	1x	☒	3100806-07
4	PERCHLORATE4		20200724_008	Perchlorate6850b.lcm	1x	☒	3100807-01
5	PERCHLORATE5		20200724_009	Perchlorate6850b.lcm	1x	☒	3100807-02
6	PERCHLORATE6		20200724_010	Perchlorate6850b.lcm	1x	☒	3100807-03
7	PERCHLORATE7		20200724_011	Perchlorate6850b.lcm	1x	☒	3100807-04
8	PERCHLORATE8		20200724_012	Perchlorate6850b.lcm	1x	☒	3100807-05
9	PERCHLORATE9		20200724_013	Perchlorate6850b.lcm	1x	☒	3100807-06
10	PERCHLORATE10		20200724_014	Perchlorate6850b.lcm	1x	☒	3100807-07
11	IB		20200724_015	Perchlorate6850b.lcm	1x	☒	
12	PERCHLORATEICV		20200724_016	Perchlorate6850b.lcm	1x	☒	3100807-08
13	IB		20200724_017	Perchlorate6850b.lcm	1x	☒	
14	LODV		20200724_018	Perchlorate6850b.lcm	1x	☒	
15	ICS		20200724_019	Perchlorate6850b.lcm	1x	☒	
16	PERCHLORATE7		20200724_020	Perchlorate6850b.lcm	1x	☒	3100807-04
17	EQ2000302-04X10		20200724_021	Perchlorate6850b.lcm	10x	☒	
18	EQ2000302-05X10DNU		20200724_022	Perchlorate6850b.lcm	10x	☒	
19	E2000626-001X2		20200724_023	Perchlorate6850b.lcm	2x	☒	
20	E2000627-001X10		20200724_024	Perchlorate6850b.lcm	10x	☒	
21	E2000627-005X100		20200724_025	Perchlorate6850b.lcm	100x	☒	
22	E2000627-006X100		20200724_026	Perchlorate6850b.lcm	100x	☒	
23	E2000627-009X1000		20200724_027	Perchlorate6850b.lcm	1000x	☒	
24	E2000640-001X200		20200724_028	Perchlorate6850b.lcm	200x	☒	
25	PERCHLORATE7		20200724_029	Perchlorate6850b.lcm	1x	☒	3100807-04
26	E2000660-001X10		20200724_030	Perchlorate6850b.lcm	10x	☒	
27	E2000627-004X10		20200724_031	Perchlorate6850b.lcm	10x	☒	
28	PERCHLORATE7		20200724_032	Perchlorate6850b.lcm	1x	☒	3100807-04
29	EQ2000302-05X10		20200724_033	Perchlorate6850b.lcm	10x	☒	
30	PERCHLORATE7		20200724_034	Perchlorate6850b.lcm	1x	☒	3100807-04
31							
32							
33							
34							
35							
36							
37							
38							

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Analyzed:**	7/20/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	7/20/20
File ID:	I:\LCMS01\DATA\20200720\20200720_022	**Calibration ID:**	EC2000014
		Analysis Lot:	688323
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.7	0.1210	0.1285	6.2	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20070400

Service Request: E2000627
Date Analyzed: 7/20/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20200720\20200720_033

Calibration Date: 7/20/20
Calibration ID: EC2000014
Analysis Lot: 688323
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.1	0.1210	0.1212	0.1	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20070400

Service Request: E2000627
Date Analyzed: 7/20/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20200720\20200720_042

Calibration Date: 7/20/20
Calibration ID: EC2000014
Analysis Lot: 688323
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.4	0.1210	0.1247	3.0	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20070400

Service Request: E2000627
Date Analyzed: 7/22/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20200722\20200722_016

Calibration Date: 7/20/20
Calibration ID: EC2000014
Analysis Lot: 688323
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.1	0.1210	0.1215	0.4	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20070400

Service Request: E2000627
Date Analyzed: 7/22/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20200722\20200722_024

Calibration Date: 7/20/20
Calibration ID: EC2000014
Analysis Lot: 688323
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.89	0.1210	0.1189	-1.8	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Analyzed:**	7/23/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	7/20/20
File ID:	I:\LCMS01\DATA\20200723\20200723_007	**Calibration ID:**	EC2000014
		Analysis Lot:	688323
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.1	0.1210	0.1214	0.3	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20070400

Service Request: E2000627
Date Analyzed: 7/23/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20200723\20200723_017

Calibration Date: 7/20/20
Calibration ID: EC2000014
Analysis Lot: 688323
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.34	0.1210	0.1122	-7.3	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Analyzed:**	7/24/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	7/24/20
File ID:	I:\LCMS01\DATA\20200724\20200724_020	**Calibration ID:**	EC2000016
		Analysis Lot:	688371
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.0	0.1210	0.1213	0.2	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Analyzed:**	7/24/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	7/24/20
File ID:	I:\LCMS01\DATA\20200724\20200724_029	**Calibration ID:**	EC2000016
		Analysis Lot:	688371
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.86	0.1210	0.1193	-1.4	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Analyzed:**	7/24/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	7/24/20
File ID:	I:\LCMS01\DATA\20200724\20200724_032	**Calibration ID:**	EC2000016
		Analysis Lot:	688371
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.75	0.1210	0.1180	-2.5	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Analyzed:**	7/24/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	7/24/20
File ID:	I:\LCMS01\DATA\20200724\20200724_034	**Calibration ID:**	EC2000016
		Analysis Lot:	688371
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.1	0.1210	0.1220	0.8	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20070400

Service Request: E2000627
Date Analyzed: 7/20/20 13:39

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID: I:\LCMS01\DATA\20200720\20200720_022
Instrument ID: E-LCMS-01
Analytical Method: 6850

Lab Code: EQ2000310-01
Analysis Lot: 688323
Signal ID: 1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	403,151	2.86
	Upper Limit ==>	604,727	4.86
	Lower Limit ==>	201,576	0.86
Associated Analyses			
Continuing Calibration Verification	EQ2000310-01	380,500	2.80
Method Blank	EQ2000302-01	475,788	2.87
Lab Control Sample	EQ2000302-02	485,348	2.87
Duplicate Lab Control Sample	EQ2000302-03	485,451	2.87

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Analyzed:**	7/20/20 15:22

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200720\20200720_033	**Lab Code:**	EQ2000310-02
Instrument ID:	E-LCMS-01	**Analysis Lot:**	688323
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	403,151	2.86
	Upper Limit ==>	604,727	4.86
	Lower Limit ==>	201,576	0.86
Associated Analyses			
Continuing Calibration Verification	EQ2000310-02	373,864	2.79
50WW06-200709	E2000627-008	226,078	2.91

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Analyzed:**	7/20/20 16:55

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200720\20200720_042	**Lab Code:**	EQ2000310-03
Instrument ID:	E-LCMS-01	**Analysis Lot:**	688323
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	403,151	2.86
	Upper Limit ==>	604,727	4.86
	Lower Limit ==>	201,576	0.86
Associated Analyses			
Continuing Calibration Verification	EQ2000310-03	224,958	2.91

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Analyzed:**	7/22/20 19:13

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200722\20200722_016	**Lab Code:**	EQ2000310-04
Instrument ID:	E-LCMS-01	**Analysis Lot:**	688323
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	403,151	2.86
	Upper Limit ==>	604,727	4.86
	Lower Limit ==>	201,576	0.86
Associated Analyses			
Continuing Calibration Verification	EQ2000310-04	223,422	2.95
50WW11-200709-FD	E2000627-007	205,907	2.95

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Analyzed:**	7/22/20 20:16

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200722\20200722_024	**Lab Code:**	EQ2000310-05
Instrument ID:	E-LCMS-01	**Analysis Lot:**	688323
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	403,151	2.86
	Upper Limit ==>	604,727	4.86
	Lower Limit ==>	201,576	0.86
Associated Analyses			
Continuing Calibration Verification	EQ2000310-05	232,812	2.95

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Analyzed:**	7/23/20 11:41

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200723\20200723_007	**Lab Code:**	EQ2000310-06
Instrument ID:	E-LCMS-01	**Analysis Lot:**	688323
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	403,151	2.86
	Upper Limit ==>	604,727	4.86
	Lower Limit ==>	201,576	0.86
Associated Analyses			
Continuing Calibration Verification	EQ2000310-06	202,016	2.92
50WW29-200708	E2000627-002	203,151	2.91
50WW05-200708	E2000627-003	217,794	2.91

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Analyzed:**	7/23/20 13:00

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200723\20200723_017	**Lab Code:**	EQ2000310-07
Instrument ID:	E-LCMS-01	**Analysis Lot:**	688323
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	403,151	2.86
	Upper Limit ==>	604,727	4.86
	Lower Limit ==>	201,576	0.86
Associated Analyses			
Continuing Calibration Verification	EQ2000310-07	202,415	2.91

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20070400

Service Request: E2000627
Date Analyzed: 7/24/20 13:59

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID: I:\LCMS01\DATA\20200724\20200724_020
Instrument ID: E-LCMS-01
Analytical Method: 6850

Lab Code: EQ2000311-01
Analysis Lot: 688371
Signal ID: 1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	161,047	2.90
	Upper Limit ==>	241,571	4.90
	Lower Limit ==>	80,524	0.90
Associated Analyses			
Continuing Calibration Verification	EQ2000311-01	149,874	2.90
50WW14-200709MS	EQ2000302-04	80,779	2.90
50WW08-200708	E2000627-001	138,403	2.90
50WW13-200709	E2000627-005	126,756	2.90
50WW11-200709	E2000627-006	113,996	2.90
50WW12-200709	E2000627-009	115,890	2.90

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Analyzed:**	7/24/20 15:11

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200724\20200724_029	**Lab Code:**	EQ2000311-02
Instrument ID:	E-LCMS-01	**Analysis Lot:**	688371
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	161,047	2.90
	Upper Limit ==>	241,571	4.90
	Lower Limit ==>	80,524	0.90
Associated Analyses			
Continuing Calibration Verification	EQ2000311-02	142,468	2.90
50WW14-200709	E2000627-004	214,190	2.85

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Analyzed:**	7/24/20 15:37

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200724\20200724_032	**Lab Code:**	EQ2000311-03
Instrument ID:	E-LCMS-01	**Analysis Lot:**	688371
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	161,047	2.90
	Upper Limit ==>	241,571	4.90
	Lower Limit ==>	80,524	0.90
Associated Analyses			
Continuing Calibration Verification	EQ2000311-03	143,487	2.90
50WW14-200709DMS	EQ2000302-05	121,804	2.85

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000627
Project:	HS20070400	**Date Analyzed:**	7/24/20 15:53

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200724\20200724_034	**Lab Code:**	EQ2000311-04
Instrument ID:	E-LCMS-01	**Analysis Lot:**	688371
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	161,047	2.90
	Upper Limit ==>	241,571	4.90
	Lower Limit ==>	80,524	0.90
Associated Analyses			
Continuing Calibration Verification	EQ2000311-04	142,073	2.90

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group Houston

PERCHLORATE7

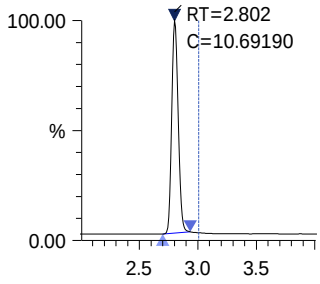
Date acquired: 7/20/2020 1:39:32 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200720\20200720_022.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	7/20/2020 1:39:32 PM	488934	10.69190	20200720_022	2.802	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	7/20/2020 1:39:32 PM	380500	1.00000	20200720_022	2.800	25.0000	1.0000	4

Perchlorate

Conc 10.69190
Area 488934

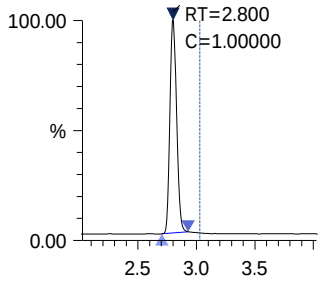
Q 99.00>83.00 (-) 1.26e5



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 380500

ISTD 107.00>89.00 (-) 9.71e4



ALS Group Houston

EQ2000302-01

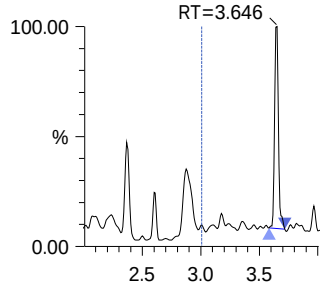
Date acquired: 7/20/2020 1:47:28 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200720\20200720_023.lcd
Vial: 1 | Inj. Volume: 25.0000uL | Tray: 3

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000302-01	7/20/2020 1:47:28 PM	----	----	20200720_023	----	25.0000	1.0000	1
Sodium Perchlorate-18O4_IS	EQ2000302-01	7/20/2020 1:47:28 PM	475788	1.00000	20200720_023	2.866	25.0000	1.0000	1

Perchlorate

Conc ----
Area ----

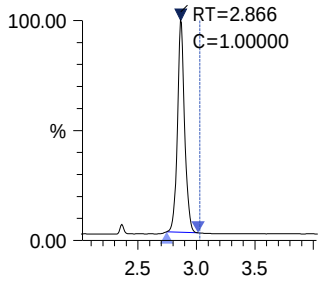
Q 99.00>83.00 (-) 6.94e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 475788

ISTD 107.00>89.00 (-) 1.12e5



ALS Group Houston

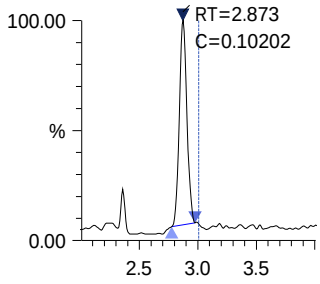
EQ2000302-02

Date acquired: 7/20/2020 1:55:23 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200720\20200720_024.lcd
Vial: 2 | Inj. Volume: 25.0000uL | Tray: 3

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000302-02	7/20/2020 1:55:23 PM	5951	0.10202	20200720_024	2.873	25.0000	1.0000	2
Sodium Perchlorate-18O4_IS	EQ2000302-02	7/20/2020 1:55:23 PM	485348	1.00000	20200720_024	2.868	25.0000	1.0000	2

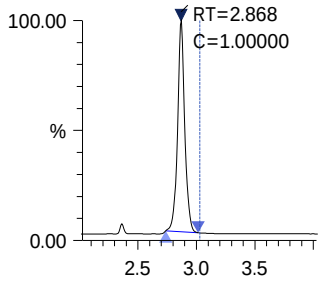
Perchlorate

Conc 0.10202
Area 5951
Q 99.00>83.00 (-) 1.38e3



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 485348
ISTD 107.00>89.00 (-) 1.15e5



ALS Group Houston

EQ2000302-03

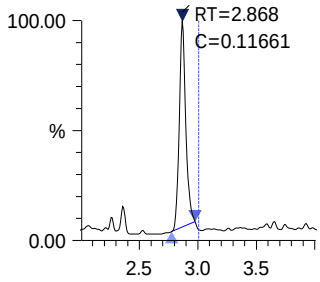
Date acquired: 7/20/2020 2:03:16 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200720\20200720_025.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 3

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000302-03	7/20/2020 2:03:16 PM	6802	0.11661	20200720_025	2.868	25.0000	1.0000	3
Sodium Perchlorate-18O4_IS	EQ2000302-03	7/20/2020 2:03:16 PM	485451	1.00000	20200720_025	2.866	25.0000	1.0000	3

Perchlorate

Conc 0.11661
Area 6802

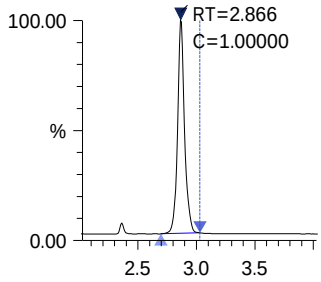
Q 99.00>83.00 (-) 1.83e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 485451

ISTD 107.00>89.00 (-) 1.17e5



ALS Group Houston

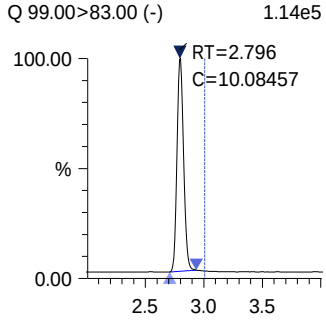
PERCHLORATE7

Date acquired: 7/20/2020 3:22:41 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200720\20200720_033.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	7/20/2020 3:22:41 PM	453118	10.08457	20200720_033	2.796	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	7/20/2020 3:22:41 PM	373864	1.00000	20200720_033	2.794	25.0000	1.0000	4

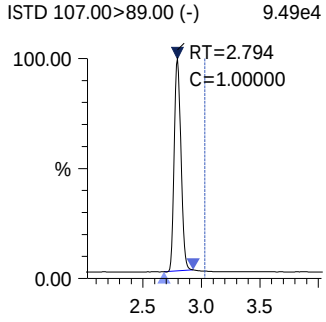
Perchlorate

Conc 10.08457
Area 453118



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 373864



ALS Group Houston

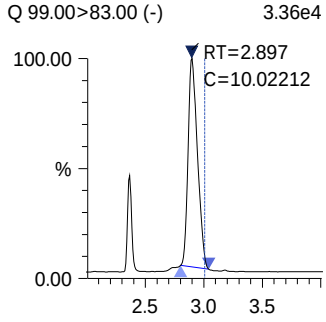
PERCHLORATE7

Date acquired: 7/24/2020 1:59:53 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200724\20200724_020.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	7/24/2020 1:59:53 PM	181792	10.02212	20200724_020	2.897	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	7/24/2020 1:59:53 PM	149874	1.00000	20200724_020	2.897	25.0000	1.0000	4

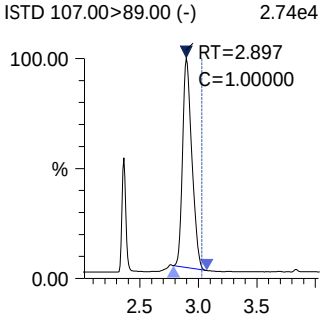
Perchlorate

Conc 10.02212
Area 181792



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 149874



ALS Group Houston

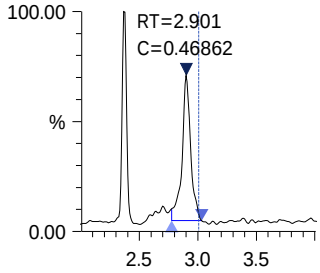
EQ2000302-04X10

Date acquired: 7/24/2020 2:07:48 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200724\20200724_021.lcd
Vial: 16 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000302-04X10	7/24/2020 2:07:48 PM	4582	0.46862	20200724_021	2.901	25.0000	1.0000	16
Sodium Perchlorate-18O4_IS	EQ2000302-04X10	7/24/2020 2:07:48 PM	80779	1.00000	20200724_021	2.897	25.0000	1.0000	16

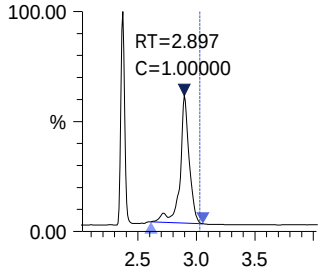
Perchlorate

Conc 0.46862
Area 4582
Q 99.00>83.00 (-) 1.33e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 80779
ISTD 107.00>89.00 (-) 2.49e4



ALS Group Houston

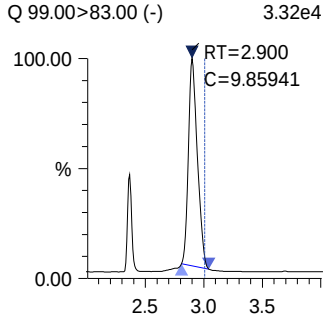
PERCHLORATE7

Date acquired: 7/24/2020 3:11:02 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200724\20200724_029.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	7/24/2020 3:11:02 PM	170004	9.85941	20200724_029	2.900	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	7/24/2020 3:11:02 PM	142468	1.00000	20200724_029	2.899	25.0000	1.0000	4

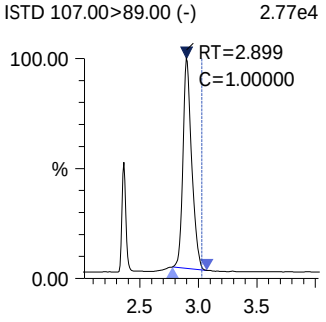
Perchlorate

Conc 9.85941
Area 170004



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 142468



ALS Group Houston

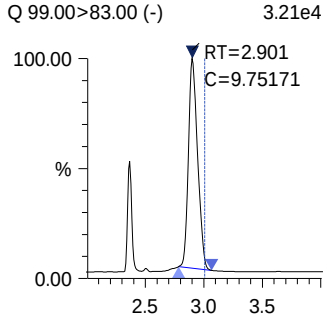
PERCHLORATE7

Date acquired: 7/24/2020 3:37:07 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200724\20200724_032.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	7/24/2020 3:37:07 PM	169350	9.75171	20200724_032	2.901	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	7/24/2020 3:37:07 PM	143487	1.00000	20200724_032	2.899	25.0000	1.0000	4

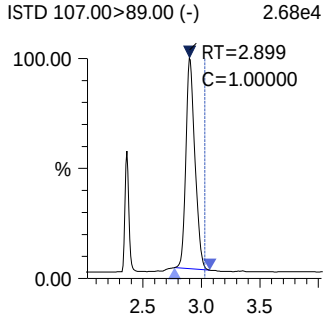
Perchlorate

Conc 9.75171
Area 169350



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 143487



ALS Group Houston

EQ2000302-05X10

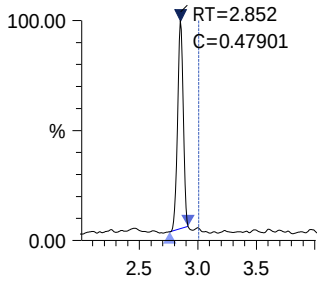
Date acquired: 7/24/2020 3:45:36 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200724\20200724_033.lcd
Vial: 17 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000302-05X10	7/24/2020 3:45:36 PM	7062	0.47901	20200724_033	2.852	25.0000	1.0000	17
Sodium Perchlorate-18O4_IS	EQ2000302-05X10	7/24/2020 3:45:36 PM	121804	1.00000	20200724_033	2.850	25.0000	1.0000	17

Perchlorate

Conc 0.47901
Area 7062

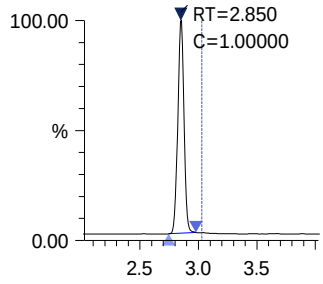
Q 99.00>83.00 (-) 2.13e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 121804

ISTD 107.00>89.00 (-) 3.33e4



ALS Group Houston

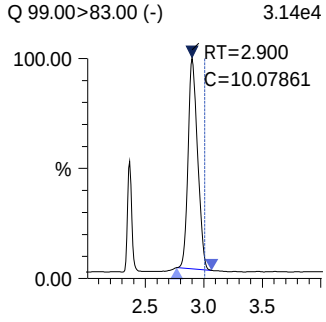
PERCHLORATE7

Date acquired: 7/24/2020 3:53:29 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200724\20200724_034.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	7/24/2020 3:53:29 PM	173301	10.07861	20200724_034	2.900	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	7/24/2020 3:53:29 PM	142073	1.00000	20200724_034	2.899	25.0000	1.0000	4

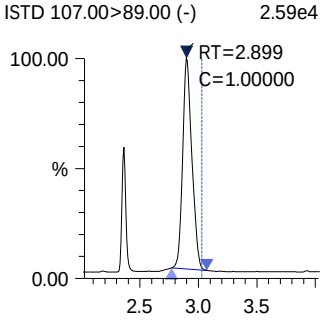
Perchlorate

Conc 10.07861
Area 173301



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 142073



LABORATORY REPORT

July 22, 2020

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road Suite 210
Houston, TX 77099-4338

RE: HS20070400

Dear RJ:

Enclosed are the results of the samples submitted to our laboratory on July 14, 2020. For your reference, these analyses have been assigned our service request number P2003888.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Hayden Akers at 12:19 pm, Jul 22, 2020

Hayden Akers
Project Manager

Client: ALS Laboratory Group Service Request No: P2003888
Project: HS20070400

CASE NARRATIVE

The samples were received intact under chain of custody on July 14, 2020 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Carbon Dioxide Analysis

The samples were analyzed for carbon dioxide using a gas chromatograph equipped with a thermal conductivity detector (TCD). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least four hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (carbon dioxide) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175 as described in laboratory SOP VOA-DISGAS. This analyte is included on the laboratory's NELAP and DoD-ELAP scope of accreditation.

Manual integrations were performed on the following samples and analyte. Refer to the raw data for additional information.

Sample Identifications	Analyte
P2003888-001MS	Carbon dioxide
P2003888-003	Carbon dioxide

Client: ALS Laboratory Group Service Request No: P2003888
Project: HS20070400

CASE NARRATIVE

Methane, Ethene and Ethane Analysis

The samples were also analyzed for methane, ethene, and ethane using a gas chromatograph equipped with a flame ionization detector (FID). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least two hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (methane, ethene and ethane) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP or DoD-ELAP accreditation.

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 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.

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2018027
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1776326
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-007
Pennsylvania DEP	http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413-19-10
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272019-10
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: ALS Laboratory Group
Project ID: HS20070400

Service Request: P2003888

Date Received: 7/14/2020
Time Received: 09:30

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - CO2	RSK 175 - Gases
50WW14-200709	P2003888-001	Water	7/9/2020	07:40	X	X
50WW13-200709	P2003888-002	Water	7/9/2020	08:45	X	X
50WW11-200709	P2003888-003	Water	7/9/2020	09:45	X	X
50WW11-200709-FD	P2003888-004	Water	7/9/2020	09:45	X	X
50WW06-200709	P2003888-005	Water	7/9/2020	10:45	X	X
50WW12-200709	P2003888-006	Water	7/9/2020	11:40	X	X

PJ6073888

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:** **14265**

SUBCONTRACT TO:

ALS Environmental
2655 Park Center Drive, Suite A
Simi Valley, CA 93065

Phone: +1 805 526 7161

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: HS20070400
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20070400-04**	**50WW14-200709**	**Groundwater**	**09 Jul 2020 07:40**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			24 Jul 2020
2.	**HS20070400-05**	**50WW13-200709**	**Groundwater**	**09 Jul 2020 08:45**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			24 Jul 2020
3.	**HS20070400-06**	**50WW11-200709**	**Groundwater**	**09 Jul 2020 09:45**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			24 Jul 2020
4.	**HS20070400-07**	**50WW11-200709-FD**	**Groundwater**	**09 Jul 2020 09:45**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			24 Jul 2020
5.	**HS20070400-08**	**50WW06-200709**	**Groundwater**	**09 Jul 2020 10:45**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			24 Jul 2020
6.	**HS20070400-09**	**50WW12-200709**	**Groundwater**	**09 Jul 2020 11:40**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			24 Jul 2020

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS20070400-04 = MS/MSD

QC Level: DOD IV (DoD Data Package)

PJ003888

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense**

COC ID: **14265**

Relinquished By:

Date/Time: 7/13/2020 1800

Received By:

Date/Time: 7-14-20 0930

Cooler ID(s):

Temperature(s): 2° not

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P2003888

Project: HS20070400

Sample(s) received on: 07/14/20 Date opened: 07/14/20 by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature: 2° C Blank Temperature: ° C Thermometer ID T-111 Wet Ic			
8	Were **custody seals** on outside of cooler/Box/Container?	☒	☐	☐
	Location of seal(s)? Cooler lid. Sealing Lid?	☒	☐	☐
	Were signature and date included?	☒	☐	☐
	Were seals intact?	☒	☐	☐
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☒	☐	☐
	Were **VOA vials** checked for presence/absence of air bubbles?	☒	☐	☐
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☒	☐
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2003888-001.01	40mL VOA NP		7		A	LD 07/16/2020
P2003888-001.02	40mL VOA NP		7		A	LD 07/16/2020
P2003888-001.03	40mL VOA NP		7		A	LD 07/16/2020
P2003888-001.04	40ml VOA HCL		1		A	LD 07/20/2020
P2003888-001.05	40ml VOA HCL		1		A	LD 07/20/2020
P2003888-001.06	40ml VOA HCL		1		A	LD 07/20/2020
P2003888-001.07	40mL VOA NP				A	
P2003888-001.08	40mL VOA NP				A	
P2003888-001.09	40mL VOA NP				A	
P2003888-001.10	40mL VOA NP				A	
P2003888-001.11	40mL VOA NP				A	
P2003888-001.12	40mL VOA NP				A	
P2003888-001.13	40ml VOA HCL				A	
P2003888-001.14	40ml VOA HCL				A	
P2003888-001.15	40ml VOA HCL				A	

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P2003888

Project: HS20070400

Sample(s) received on: 07/14/20 Date opened: 07/14/20 by: ADAVID

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2003888-001.16	40ml VOA HCL				A	
P2003888-001.17	40ml VOA HCL				A	
P2003888-001.18	40ml VOA HCL				A	
P2003888-002.01	40mL VOA NP		7		A	LD 07/16/2020
P2003888-002.02	40mL VOA NP				A	
P2003888-002.03	40mL VOA NP				A	
P2003888-002.04	40ml VOA HCL		1		A	LD 07/20/2020
P2003888-002.05	40ml VOA HCL				A	
P2003888-002.06	40ml VOA HCL				A	
P2003888-003.01	40mL VOA NP		7		A	LD 07/16/2020
P2003888-003.02	40mL VOA NP				A	
P2003888-003.03	40mL VOA NP				A	
P2003888-003.04	40ml VOA HCL		1		A	LD 07/20/2020
P2003888-003.05	40ml VOA HCL				A	
P2003888-003.06	40ml VOA HCL				A	
P2003888-004.01	40mL VOA NP		7		A	LD 07/16/2020
P2003888-004.02	40mL VOA NP				A	
P2003888-004.03	40mL VOA NP				A	
P2003888-004.04	40ml VOA HCL		1		A	LD 07/20/2020
P2003888-004.05	40ml VOA HCL				A	
P2003888-004.06	40ml VOA HCL				A	
P2003888-005.01	40mL VOA NP		7		A	LD 07/16/2020
P2003888-005.02	40mL VOA NP				A	
P2003888-005.03	40mL VOA NP				A	
P2003888-005.04	40ml VOA HCL		1		A	LD 07/20/2020
P2003888-005.05	40ml VOA HCL				A	
P2003888-005.06	40ml VOA HCL				A	
P2003888-006.01	40mL VOA NP		7		A	LD 07/16/2020
P2003888-006.02	40mL VOA NP				A	
P2003888-006.03	40mL VOA NP				A	
P2003888-006.04	40ml VOA HCL		1		A	LD 07/20/2020
P2003888-006.05	40ml VOA HCL				A	
P2003888-006.06	40ml VOA HCL				A	

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Project ID: **HS20070400** ALS Project ID: P2003888

Carbon Dioxide

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Li Donghao
Matrix: Water
Test Notes:

Date(s) Collected: 7/9/20
Date Received: 7/14/20
Date Analyzed: 7/16/20

Client Sample ID	ALS Sample ID	Injection Volume ml(s)	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
50WW14-200709	P2003888-001	0.10	**85,000**	1,000	860	370	
50WW13-200709	P2003888-002	0.10	**72,000**	1,000	860	370	
50WW11-200709	P2003888-003	0.10	**85,000**	1,000	860	370	
50WW11-200709-FD	P2003888-004	0.10	**80,000**	1,000	860	370	
50WW06-200709	P2003888-005	0.10	**98,000**	1,000	860	370	
50WW12-200709	P2003888-006	0.10	**140,000**	1,000	860	370	
Method Control Sample	P200716-MB	0.10	860	1,000	860	370	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample** ALS Project ID: P2003888
Client Project ID: **HS20070400** ALS Sample ID: P200716-DLCS

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/TCD Date Received: NA
Analyst: Li Donghao Date Analyzed: 7/16/20
Matrix: Water Volume(s) Analyzed: NA ml(s)
Test Notes:

CAS #	Compound	Spike Amount LCS / DLCS ug/L	Result$_1$ LCS ug/L	Result$_1$ DLCS ug/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
124-38-9	Carbon Dioxide	22,900	19,700	20,300	**86**	**89**	80-122	3	12	

$_1$ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

ALS ENVIRONMENTAL

MATRIX SPIKE / DUPLICATE MATRIX SPIKE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **50WW14-200709**
Client Project ID: **HS20070400**

ALS Project ID: P2003888
ALS Sample ID: P2003888-001MS
P2003888-001DMS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Li Donghao
Matrix: Water
Test Notes:

Date Collected: ######
Date Received: ######
Date Analyzed: ######
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount MS / DMS ug/L	Sample Amount ug/L	Result MS ug/L	Result DMS ug/L	% Recovery MS	% Recovery DMS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
124-38-9	Carbon Dioxide	22,900	84,800	110,000	108,000	**110**	**101**	80-122	9	30	

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW14-200709**
Client Project ID: **HS20070400**

ALS Project ID: P2003888
ALS Sample ID: P2003888-001

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Li Donghao
Matrix: Water
Test Notes:

Date Collected: 07/09/20
Date Received: 07/14/20
Date Analyzed: 07/20/20
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**1.9**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW13-200709** ALS Project ID: P2003888
Client Project ID: **HS20070400** ALS Sample ID: P2003888-002

Test Code: RSK 175 Date Collected: 07/09/20
Instrument ID: HP5890A/GC10/FID Date Received: 07/14/20
Analyst: Li Donghao Date Analyzed: 07/20/20
Matrix: Water Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**0.65**	1.3	1.0	0.51	**J**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW11-200709**
Client Project ID: **HS20070400**

ALS Project ID: P2003888
ALS Sample ID: P2003888-003

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Li Donghao
Matrix: Water
Test Notes:

Date Collected: 07/09/20
Date Received: 07/14/20
Date Analyzed: 07/20/20
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	**U**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW11-200709-FD** ALS Project ID: P2003888
Client Project ID: **HS20070400** ALS Sample ID: P2003888-004

Test Code: RSK 175 Date Collected: 07/09/20
Instrument ID: HP5890A/GC10/FID Date Received: 07/14/20
Analyst: Li Donghao Date Analyzed: 07/20/20
Matrix: Water Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**0.93**	1.3	1.0	0.51	**J**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW06-200709** ALS Project ID: P2003888
Client Project ID: **HS20070400** ALS Sample ID: P2003888-005

Test Code: RSK 175 Date Collected: 07/09/20
Instrument ID: HP5890A/GC10/FID Date Received: 07/14/20
Analyst: Li Donghao Date Analyzed: 07/20/20
Matrix: Water Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**2.1**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW12-200709** ALS Project ID: P2003888
Client Project ID: **HS20070400** ALS Sample ID: P2003888-006

Test Code: RSK 175 Date Collected: 07/09/20
Instrument ID: HP5890A/GC10/FID Date Received: 07/14/20
Analyst: Li Donghao Date Analyzed: 07/20/20
Matrix: Water Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**0.68**	1.3	1.0	0.51	**J**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **Method Control Sample** ALS Project ID: P2003888
Client Project ID: **HS20070400** ALS Sample ID: P200720-MB

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/FID Date Received: NA
Analyst: Li Donghao Date Analyzed: 7/20/20
Matrix: Water Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	**U**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

MATRIX SPIKE / DUPLICATE MATRIX SPIKE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **50WW14-200709**
Client Project ID: **HS20070400**

ALS Project ID: P2003888
ALS Sample ID: P2003888-001MS
P2003888-001DMS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Li Donghao
Matrix: Water
Test Notes:

Date Collected: 7/9/20
Date Received: 7/14/20
Date Analyzed: 7/20/20
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount MS / DMS µg/L	Sample Amount µg/L	Result MS µg/L	Result DMS µg/L	% Recovery MS	% Recovery DMS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	2.52	1.93	4.56	4.70	**104**	**110**	73-125	6	30	
74-85-1	Ethene	4.40	ND	4.41	4.49	**100**	**102**	72-133	2	30	
74-84-0	Ethane	4.72	ND	4.14	4.14	**88**	**88**	74-131	0	30	

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **HS20070400**

ALS Project ID: P2003888
ALS Sample ID: P200720-LCS
P200720-DLCS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Li Donghao
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 7/20/20
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount LCS / DLCS µg/L	Result$_1$ LCS µg/L	Result$_1$ DLCS µg/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	2.52	2.31	2.35	**92**	**93**	73-125	1	26	
74-85-1	Ethene	4.40	4.98	4.99	**113**	**113**	72-133	0	11	
74-84-0	Ethane	4.72	4.55	4.60	**96**	**97**	74-131	1	10	

$_1$ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162006.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 12:34:40
Operator : LD
Sample : P2003888-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 12:50:27 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

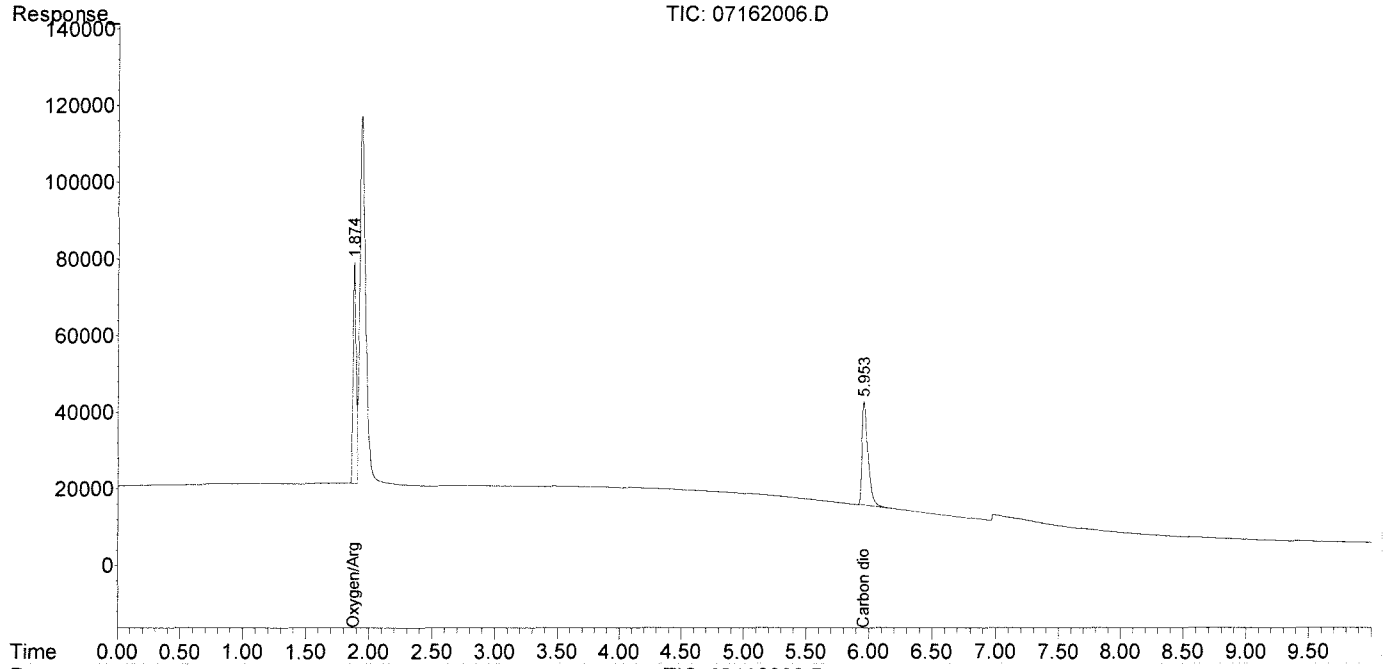
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.875	978790	0.206	ppm
2)	Carbon monoxide	1.875	978790	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.953	912453	3887.258	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

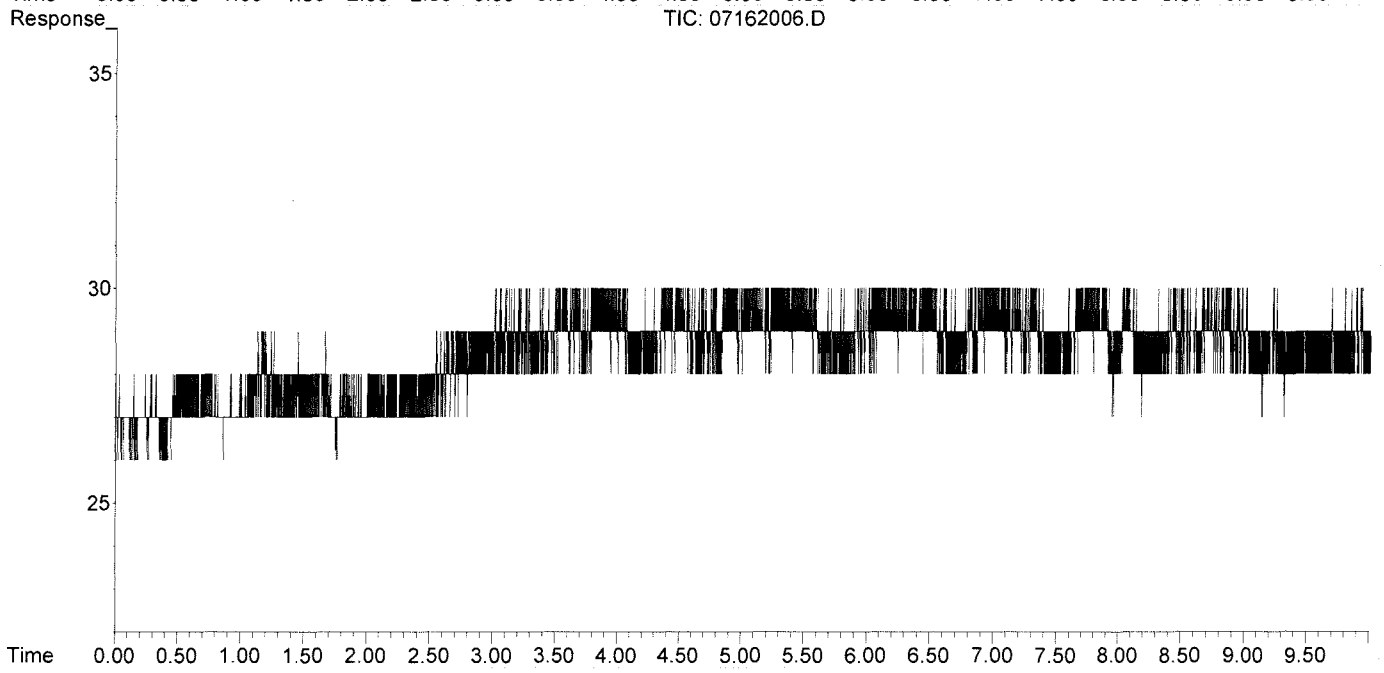
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162006.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 12:34:40
Operator : LD
Sample : P2003888-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 12:50:27 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162009.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 13:13:48
Operator : LD
Sample : P2003888-001 MS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 13:22:42 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.855	2810641	0.591	ppm	
2)	Carbon monoxide	1.855	2810641	N.D.	ppm	
3)	Methane (TCD)	4.062f	501489	53026.410	ppm	
4)	Carbon dioxide	5.949	1184580	5046.581	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

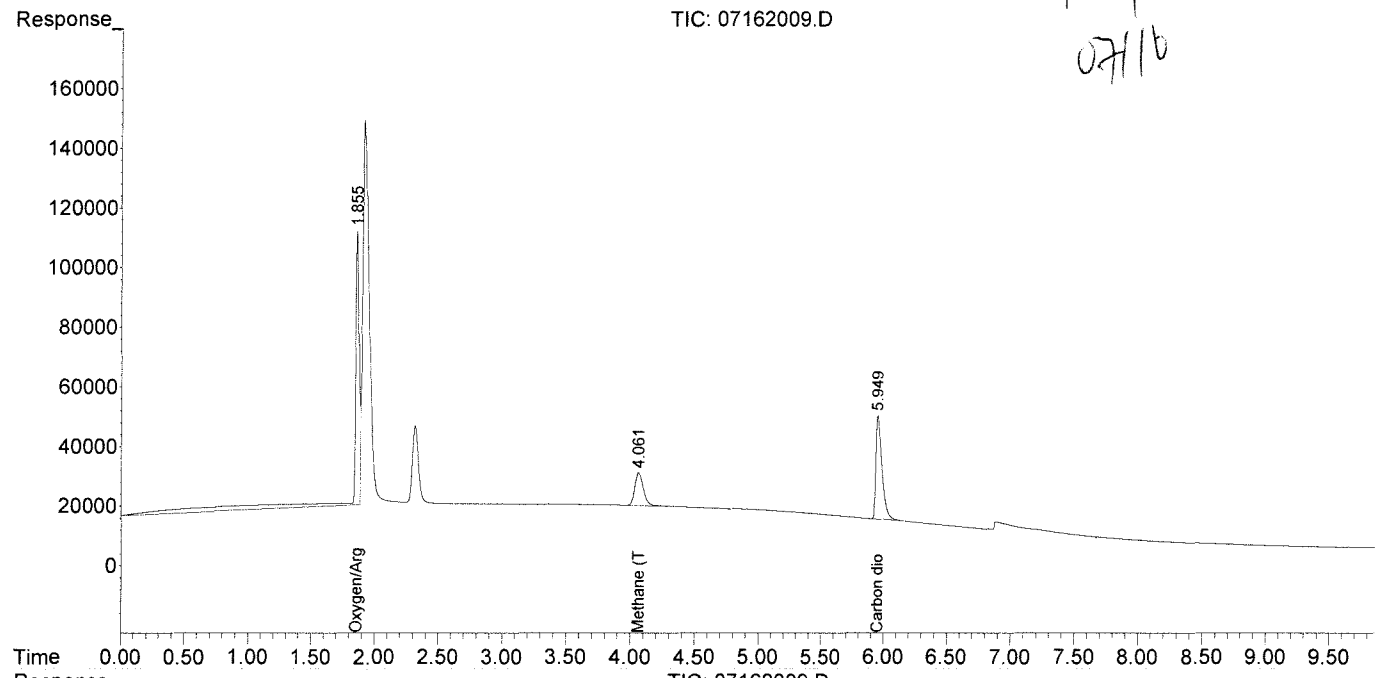
(f)=RT Delta > 1/2 Window (m)=manual int.

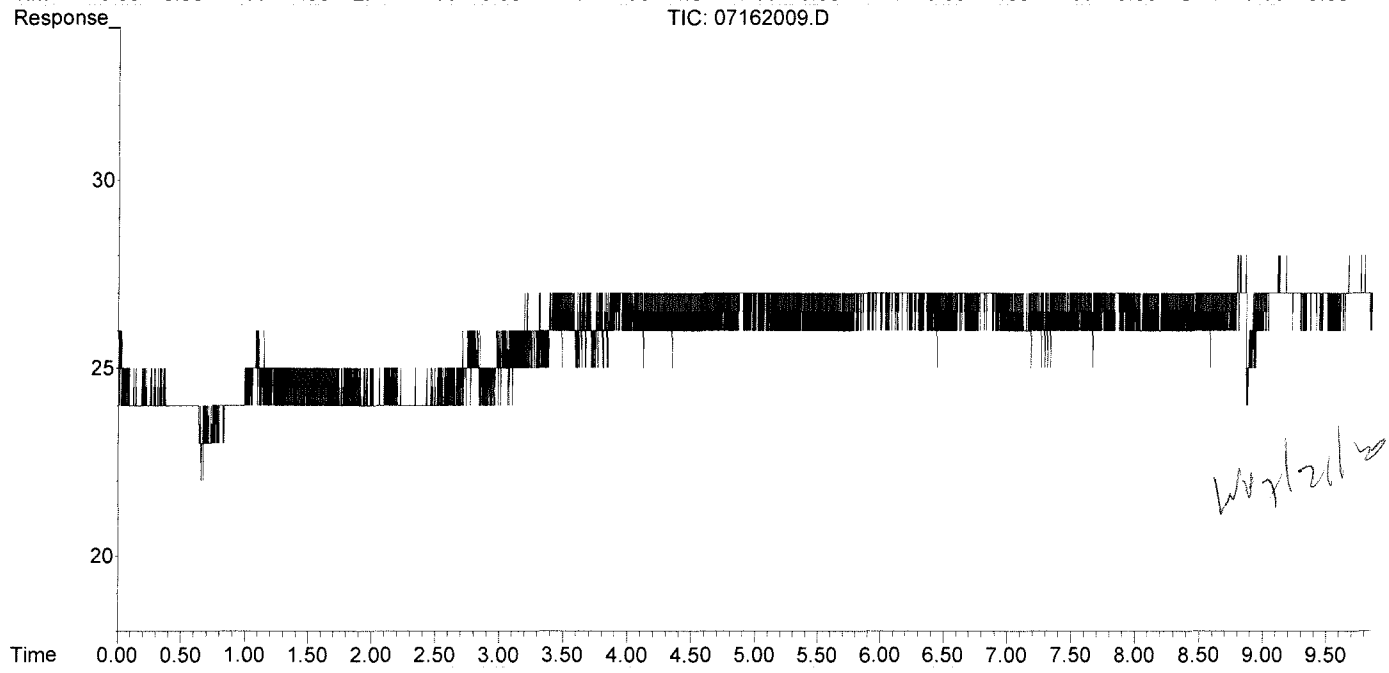
Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162009.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 13:13:48
Operator : LD
Sample : P2003888-001 MS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 13:22:42 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

LP
BLC
no previous
07/16

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162010.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 13:27:06
Operator : LD
Sample : P2003888-001 MSD 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 13:43:45 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

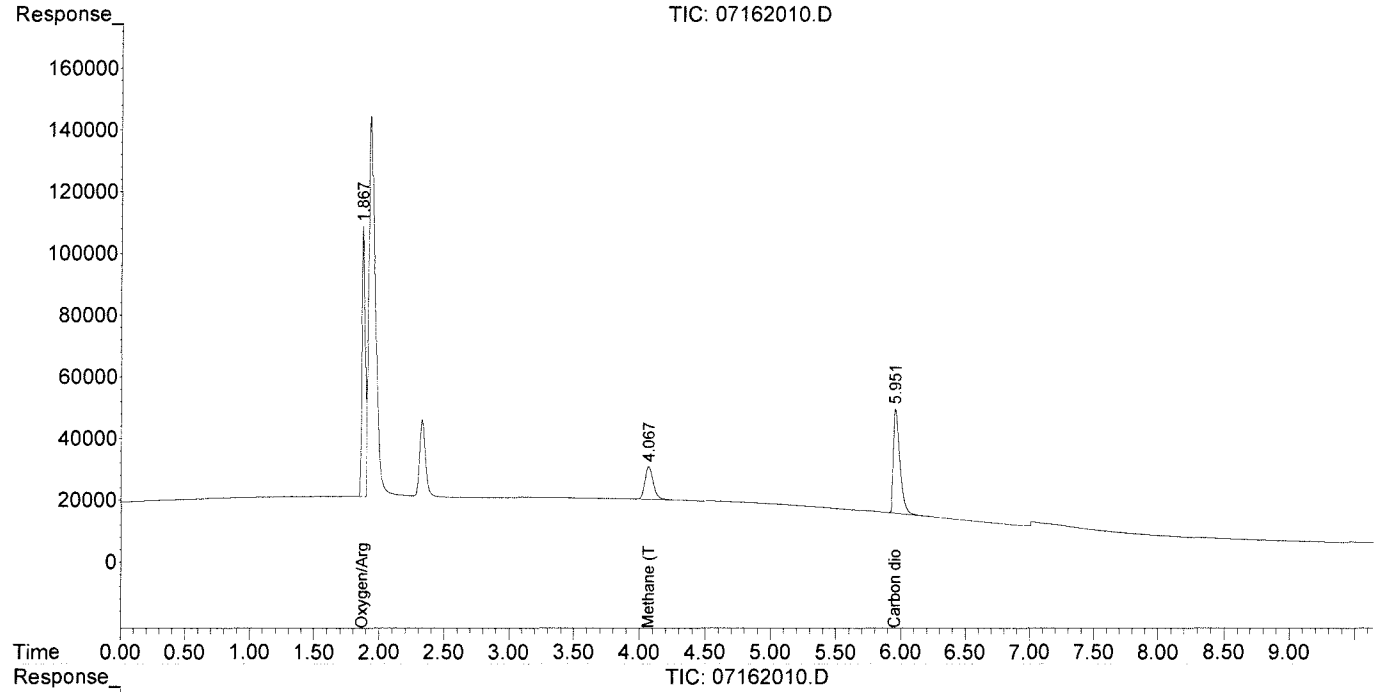
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.868	1528951	0.321	ppm
2)	Carbon monoxide	1.868	1528951	N.D.	ppm
3)	Methane (TCD)	4.067f	482500	51018.494	ppm
4)	Carbon dioxide	5.952	1160539	4944.162	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

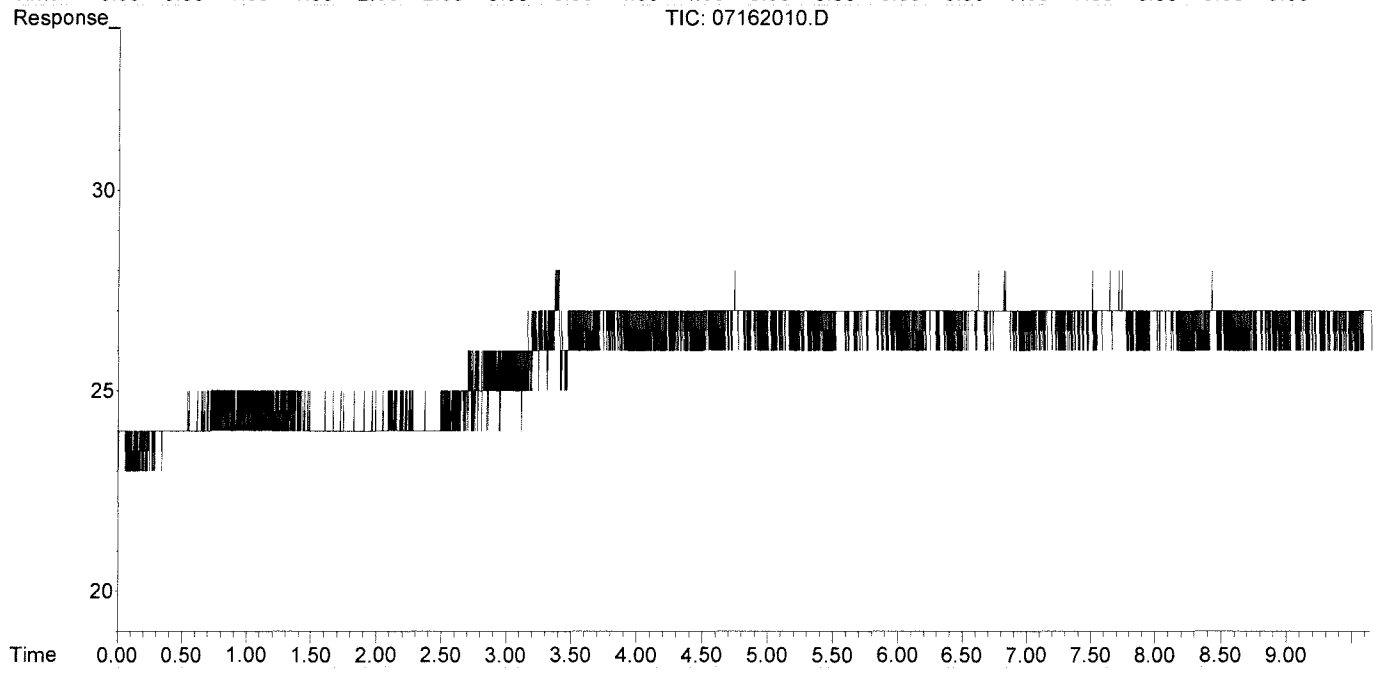
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162010.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 13:27:06
Operator : LD
Sample : P2003888-001 MSD 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 13:43:45 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162011.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 13:39:25
Operator : LD
Sample : P2003888-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 14:22:46 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

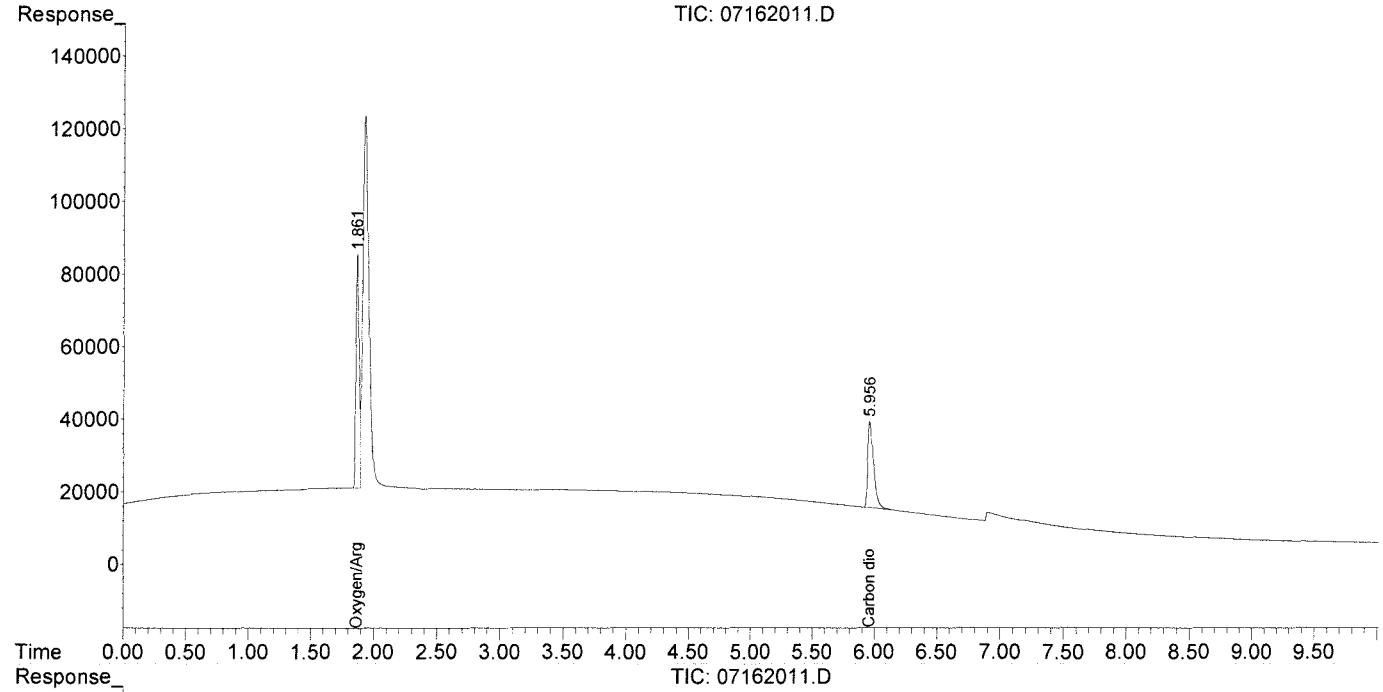
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.862	1096464	0.230	ppm
2)	Carbon monoxide	1.862	1096464	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.957	777892	3313.996	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

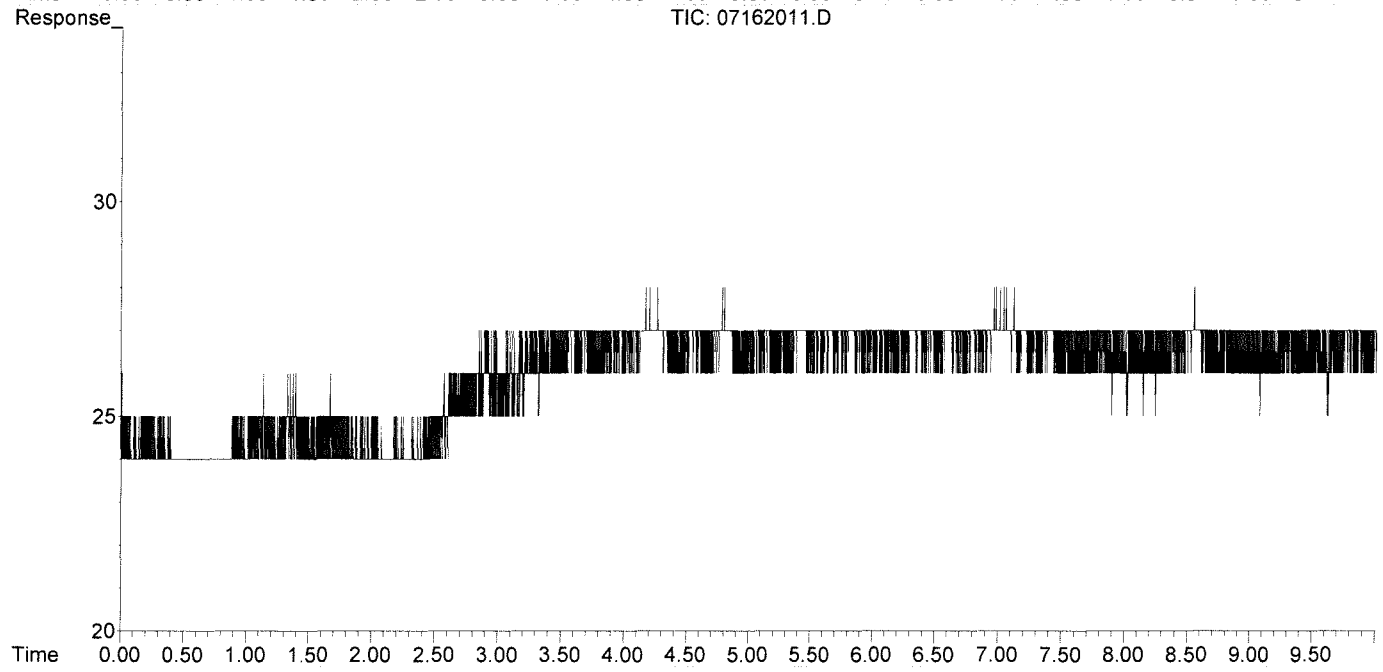
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162011.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 13:39:25
Operator : LD
Sample : P2003888-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 14:22:46 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162012.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 14:21:55
Operator : LD
Sample : P2003888-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 15:24:19 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

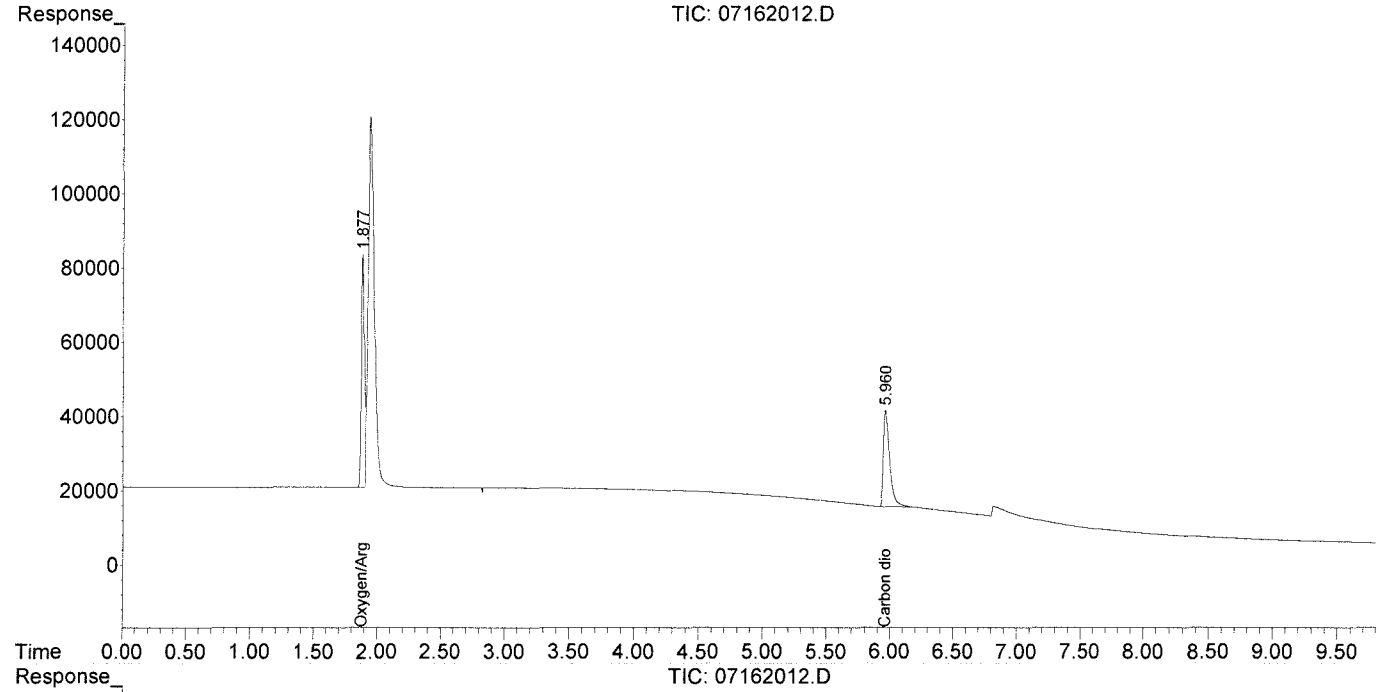
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.878	1075220	0.226	ppm	
2)	Carbon monoxide	1.878	1075220	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	5.960	918910	3914.766	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

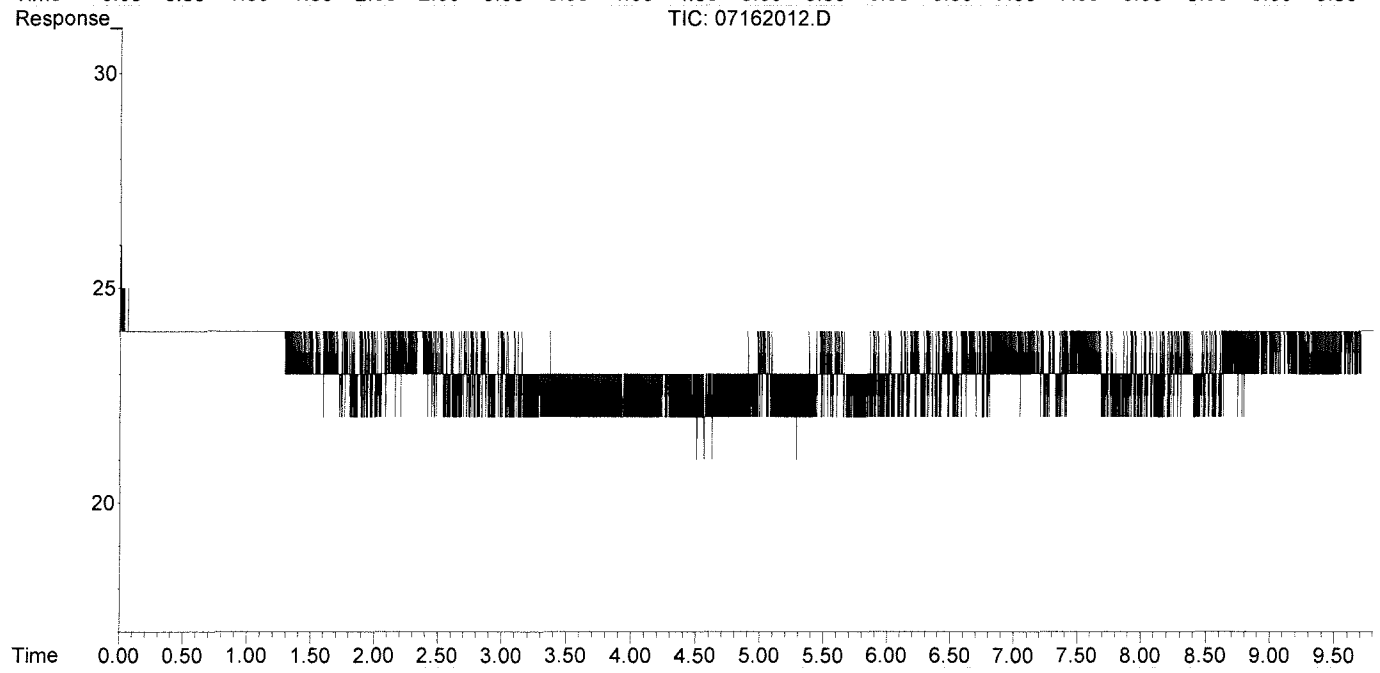
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162012.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 14:21:55
Operator : LD
Sample : P2003888-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 15:24:19 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

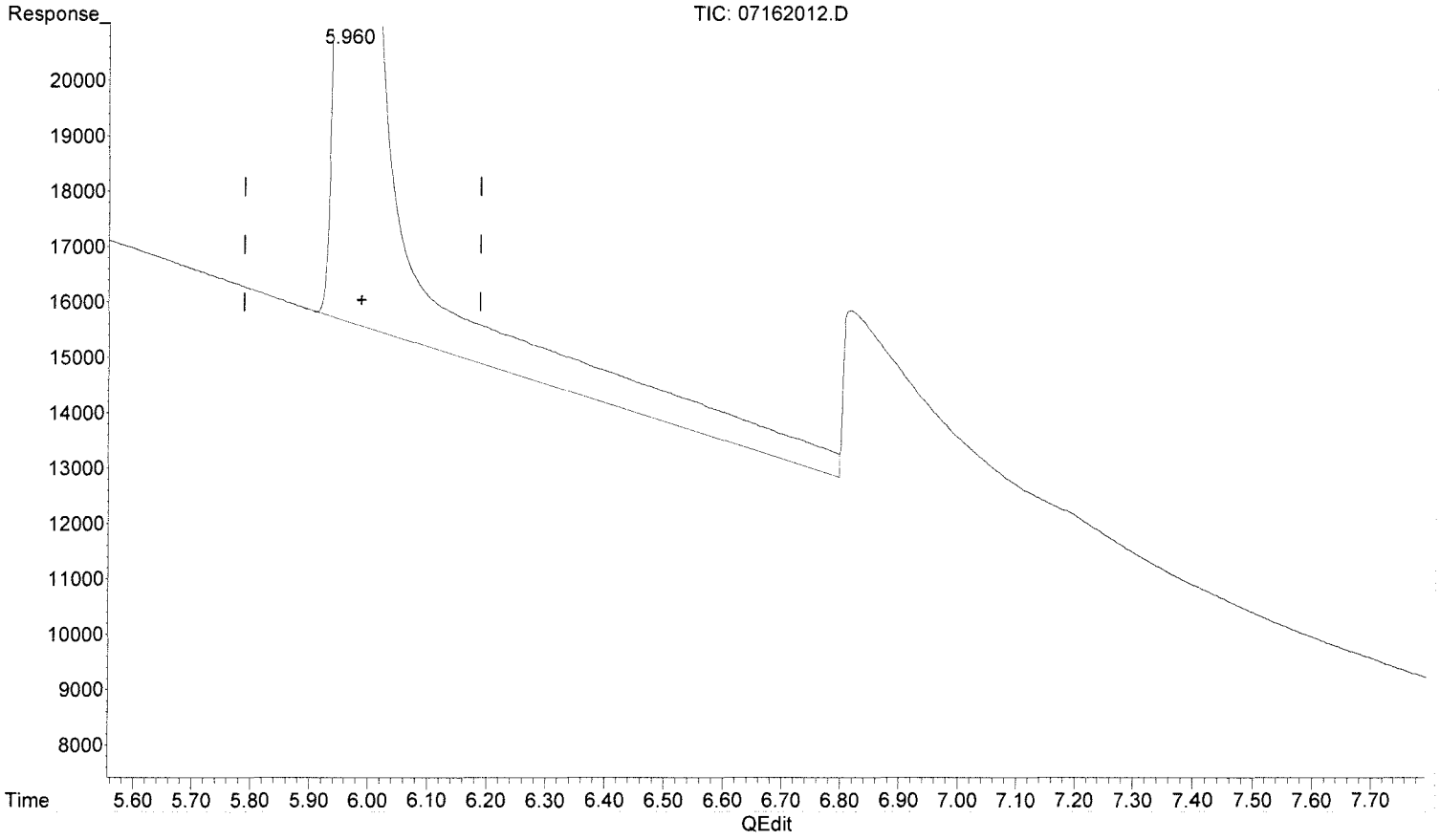




Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162012.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 14:21:55
Operator : LD
Sample : P2003888-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 15:24:19 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.960min 4993.526 ppm

response 1172126

(+) = Expected Retention Time

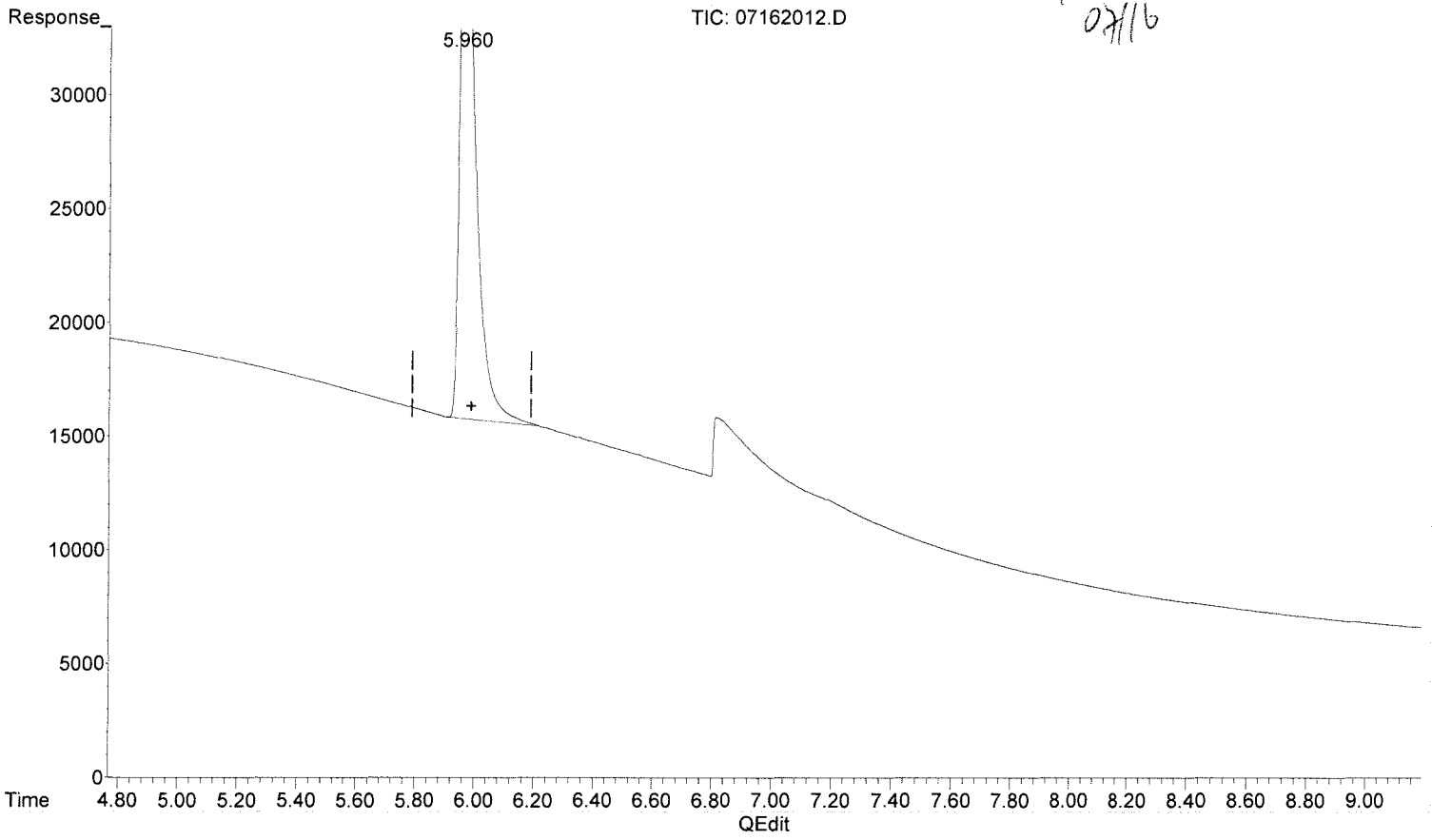
01077801

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162012.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 14:21:55
Operator : LD
Sample : P2003888-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 15:24:19 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

LD
BLC
07/16



(4) Carbon dioxide

5.960min 3914.766 ppm m

response 918910

MW 7/21/20

(+) = Expected Retention Time

Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162013.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 14:35:50
Operator : LD
Sample : P2003888-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 15:24:43 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

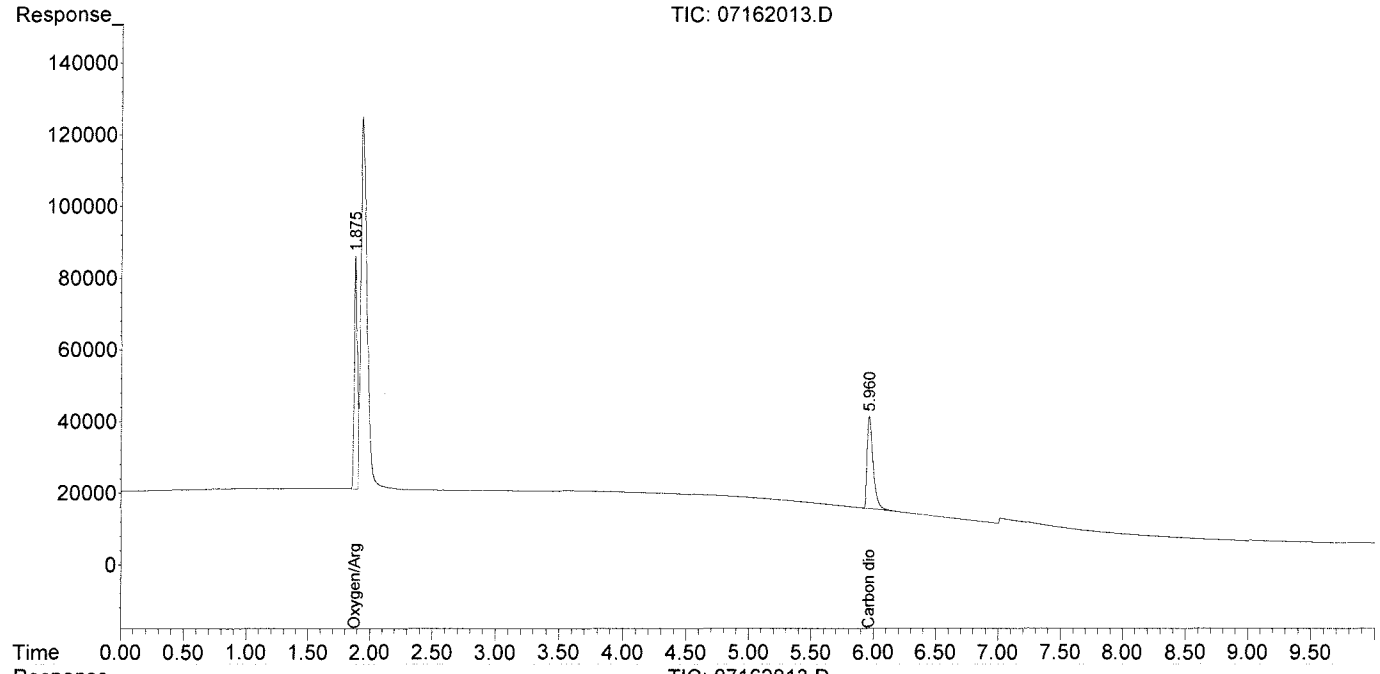
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.876	1112471	0.234	ppm
2)	Carbon monoxide	1.876	1112471	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.960	863912	3680.464	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

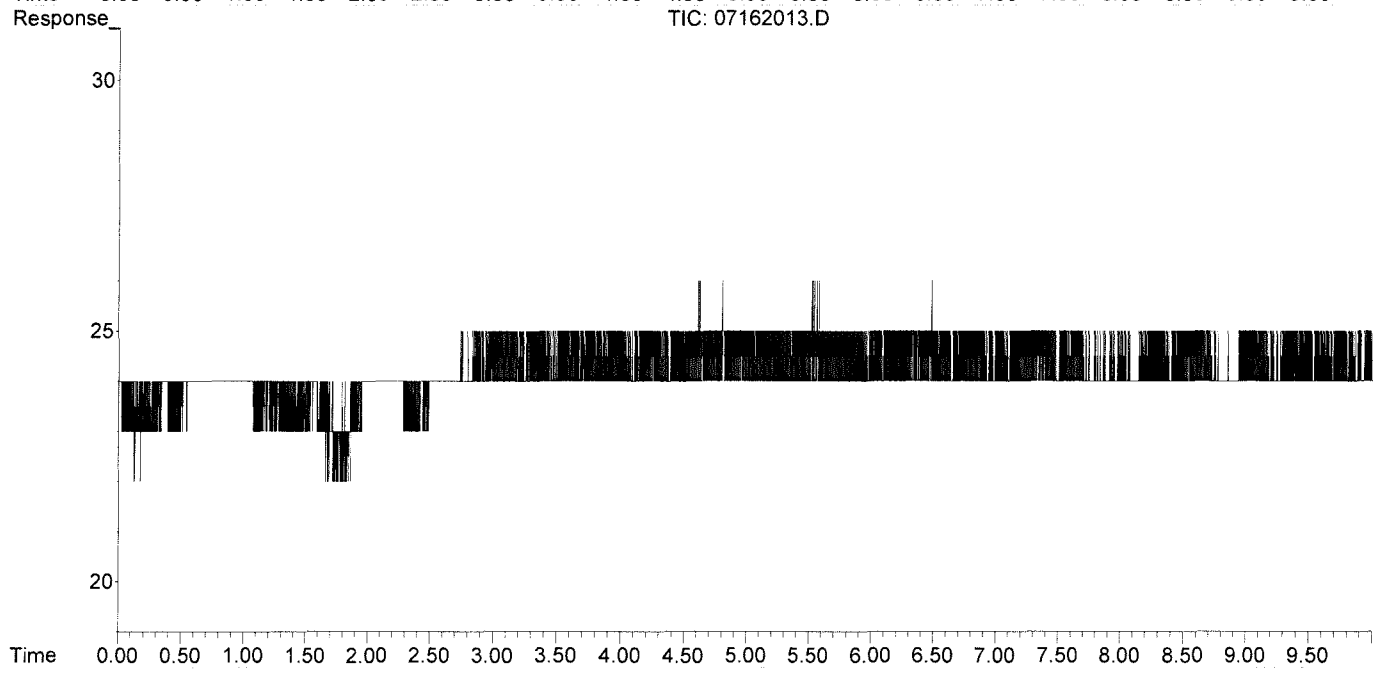
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162013.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 14:35:50
Operator : LD
Sample : P2003888-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 15:24:43 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162014.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 14:52:13
Operator : LD
Sample : P2003888-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 15:24:54 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

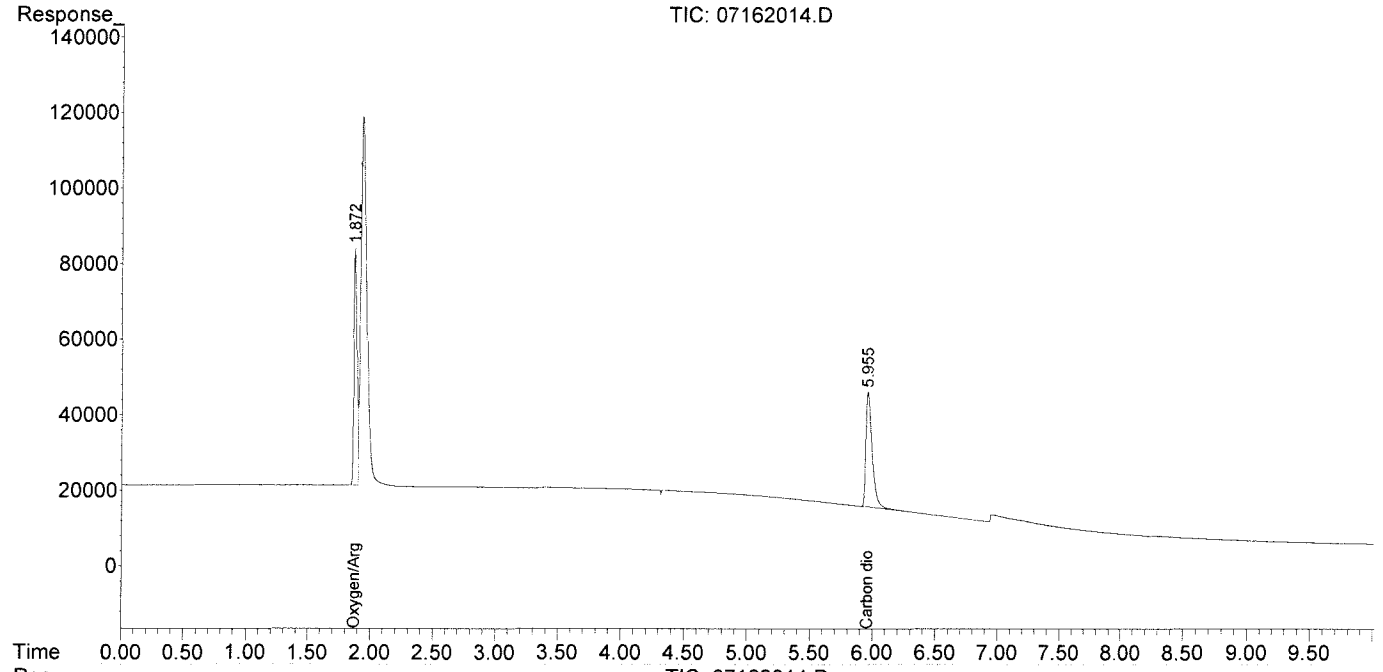
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.873	1073949	0.226	ppm
2)	Carbon monoxide	1.873	1073949	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.956	1058586	4509.817	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

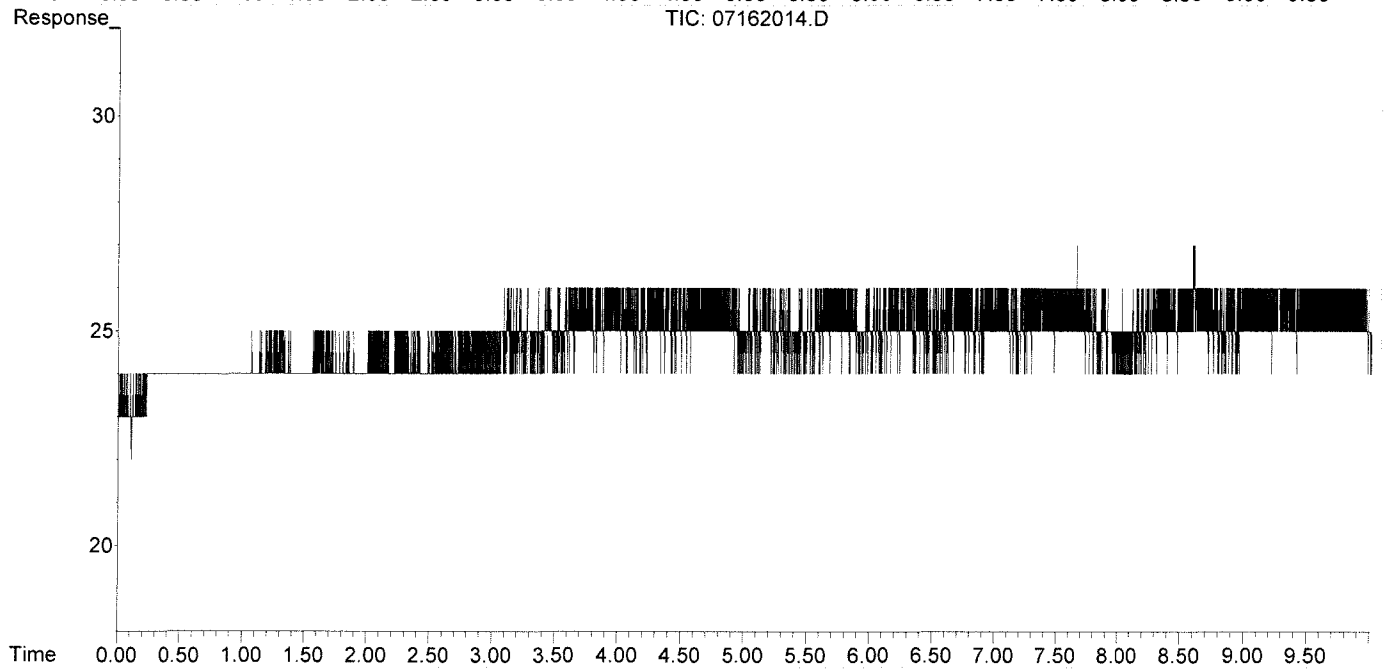
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162014.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 14:52:13
Operator : LD
Sample : P2003888-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 15:24:54 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162015.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 15:07:08
Operator : LD
Sample : P2003888-006 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 15:25:17 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

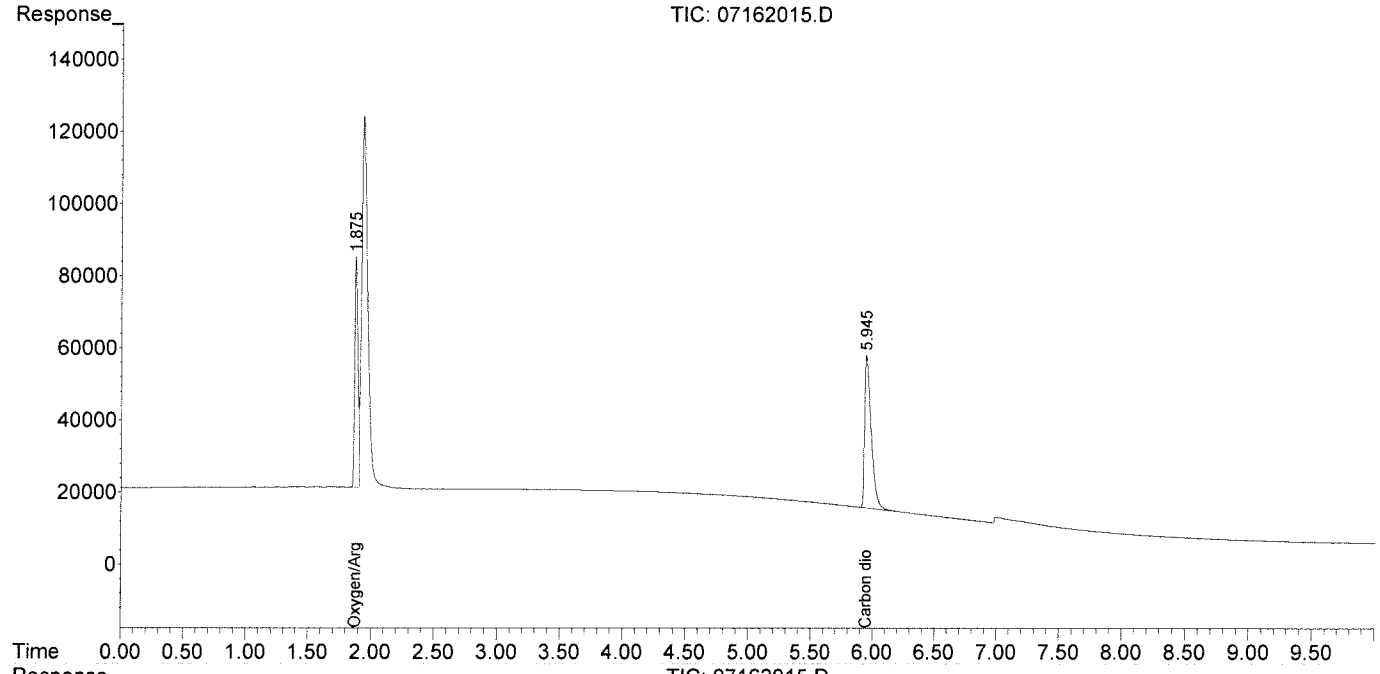
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.876	1086790	0.228	ppm
2)	Carbon monoxide	1.876	1086790	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.946	1542951	6573.325	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

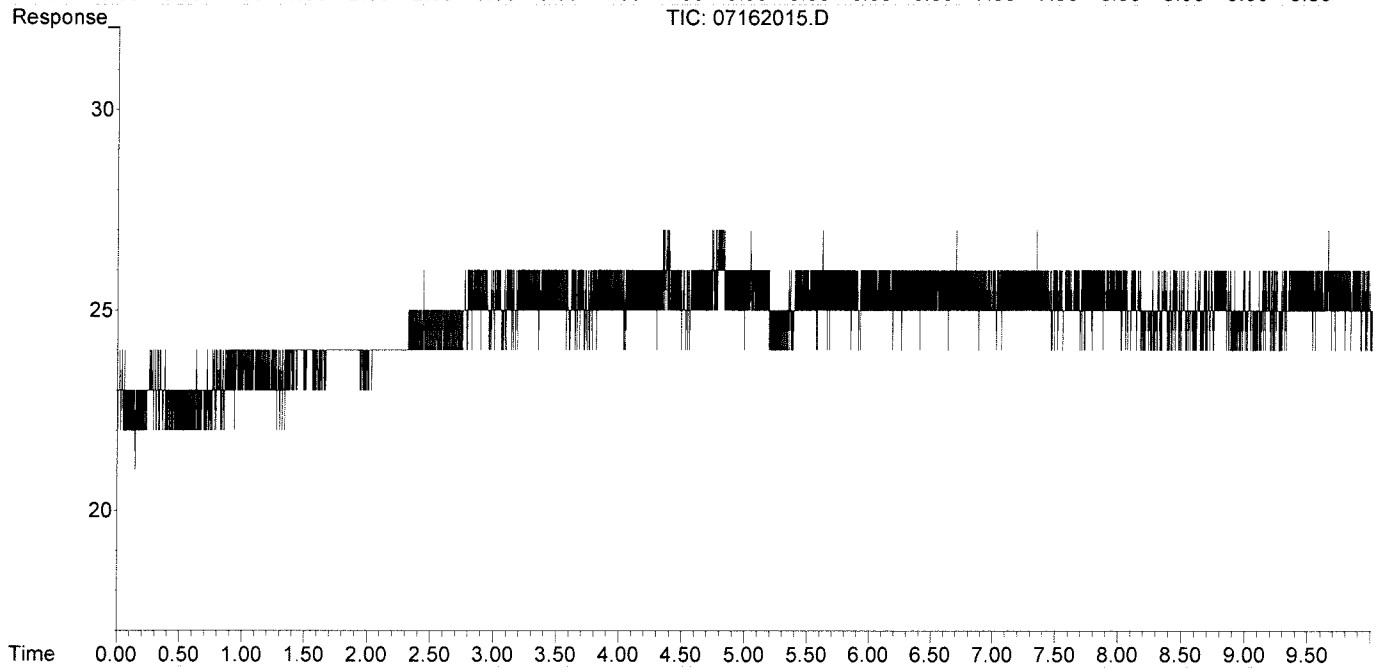
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162015.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 15:07:08
Operator : LD
Sample : P2003888-006 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 15:25:17 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162003.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 11:25:16
Operator : LD
Sample : MCS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 11:51:08 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

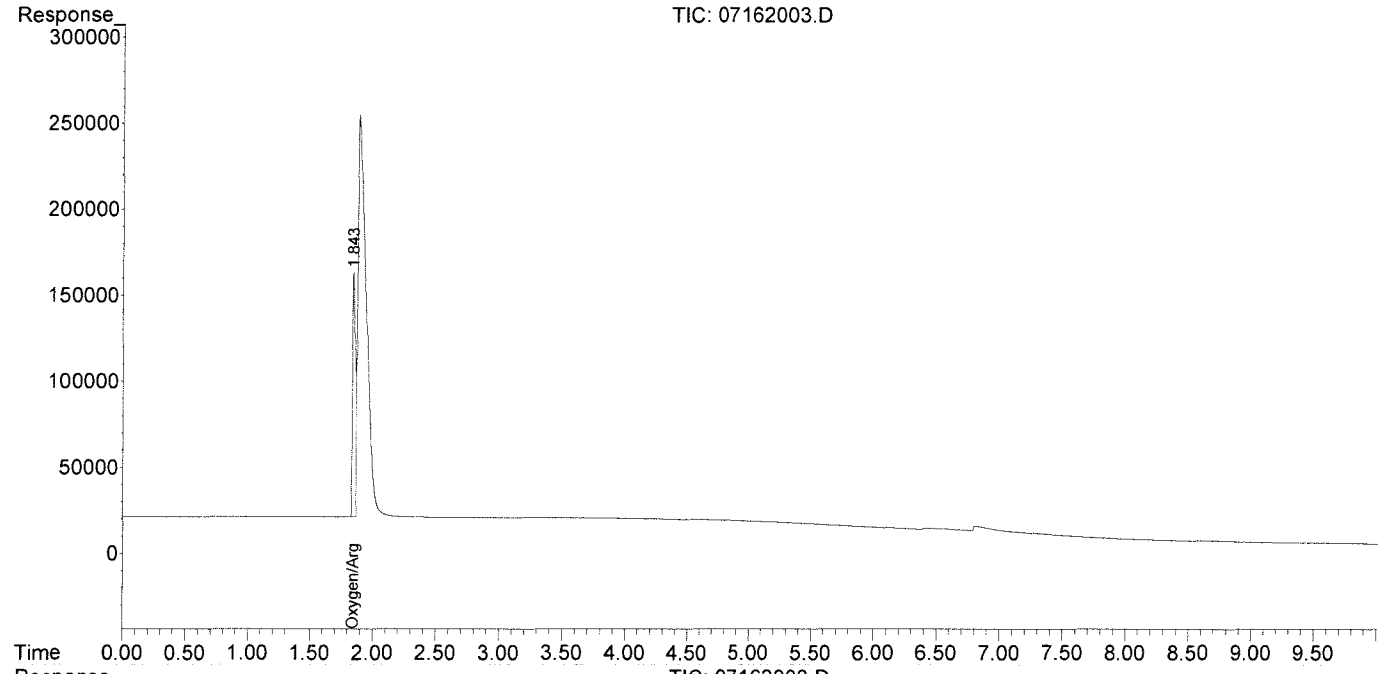
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.844	2228671	0.468	ppm
2)	Carbon monoxide	1.844	2228671	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

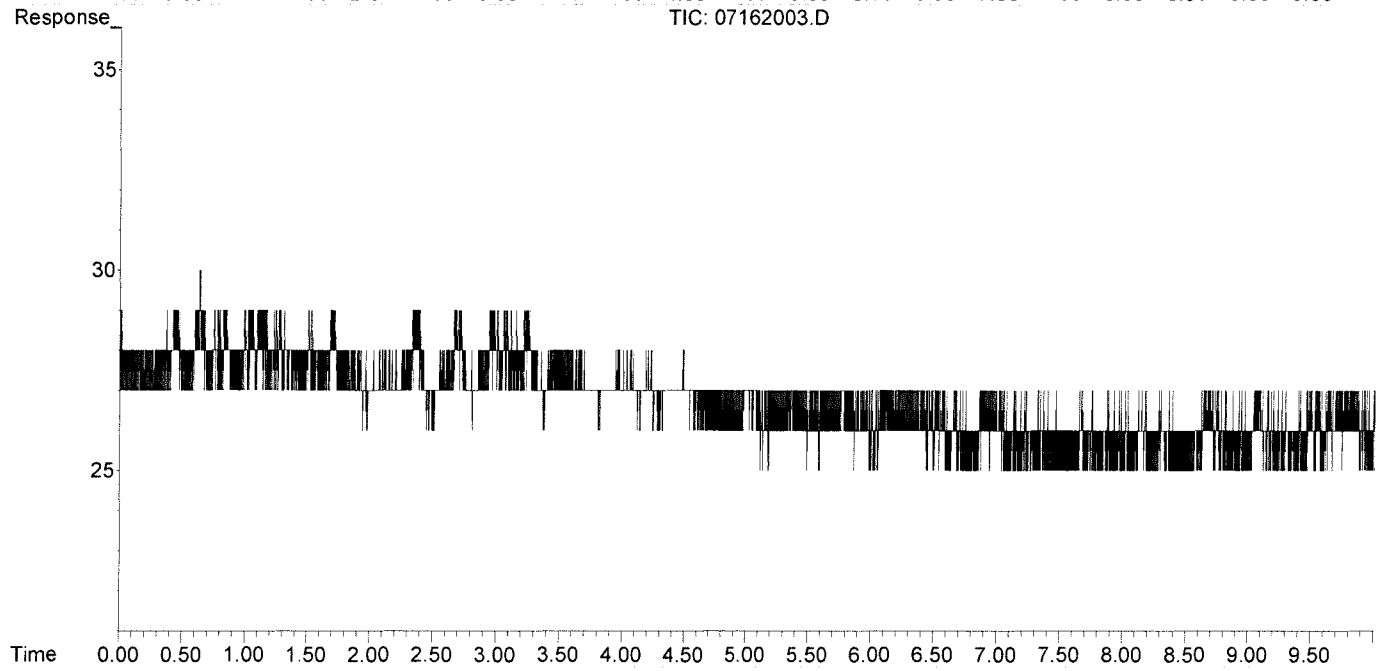
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162003.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 11:25:16
Operator : LD
Sample : MCS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 11:51:08 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162004.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 12:07:21
Operator : LD
Sample : LCS S32-07072004
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 12:18:23 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

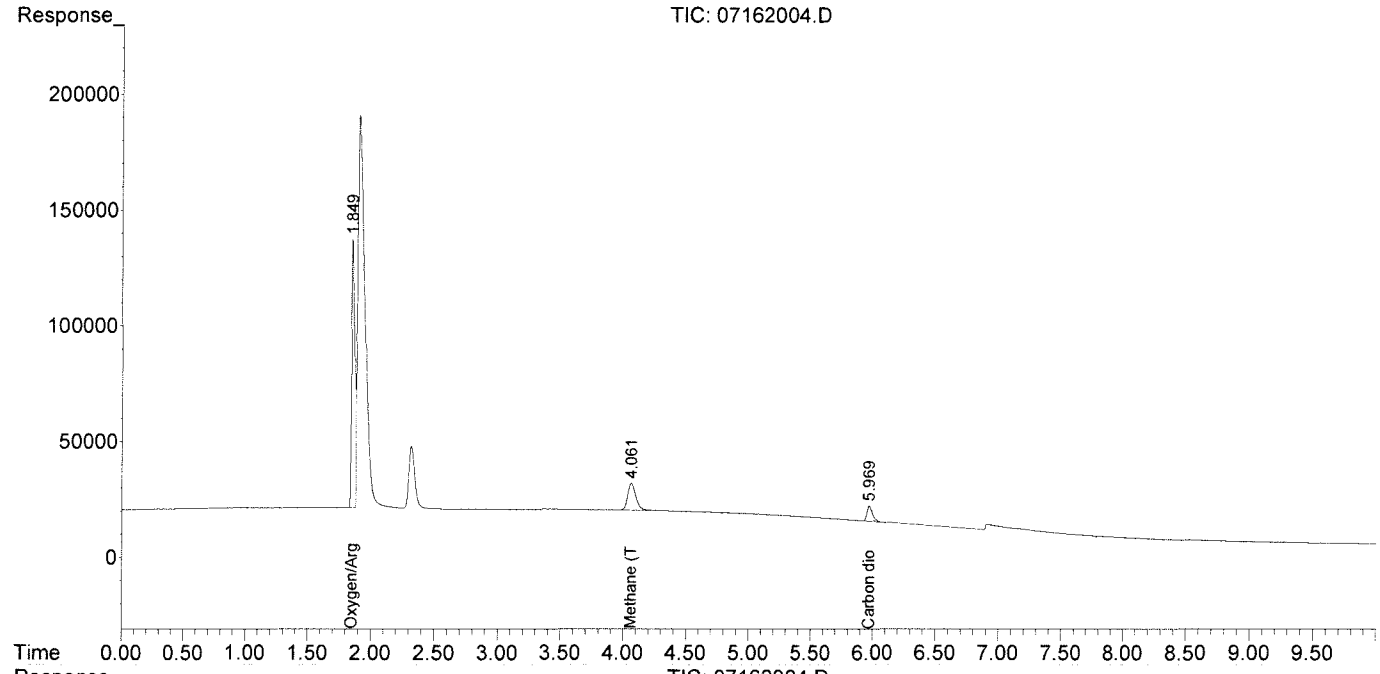
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.850	1996585	0.419	ppm
2)	Carbon monoxide	1.850	1996585	N.D.	ppm
3)	Methane (TCD)	4.061f	530484	56092.189	ppm
4)	Carbon dioxide	5.970	212377	904.777	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

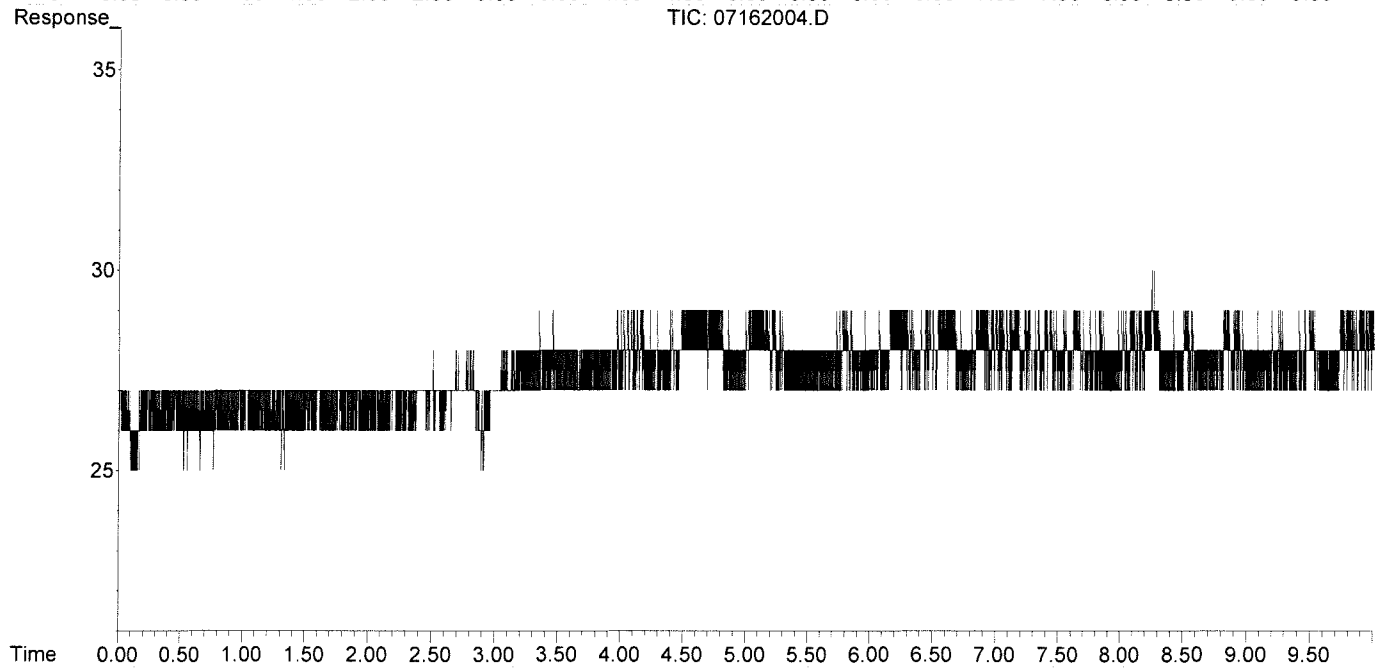
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162004.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 12:07:21
Operator : LD
Sample : LCS S32-07072004
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 12:18:23 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162005.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 12:20:16
Operator : LD
Sample : LCSD S32-07072004
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 12:32:27 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

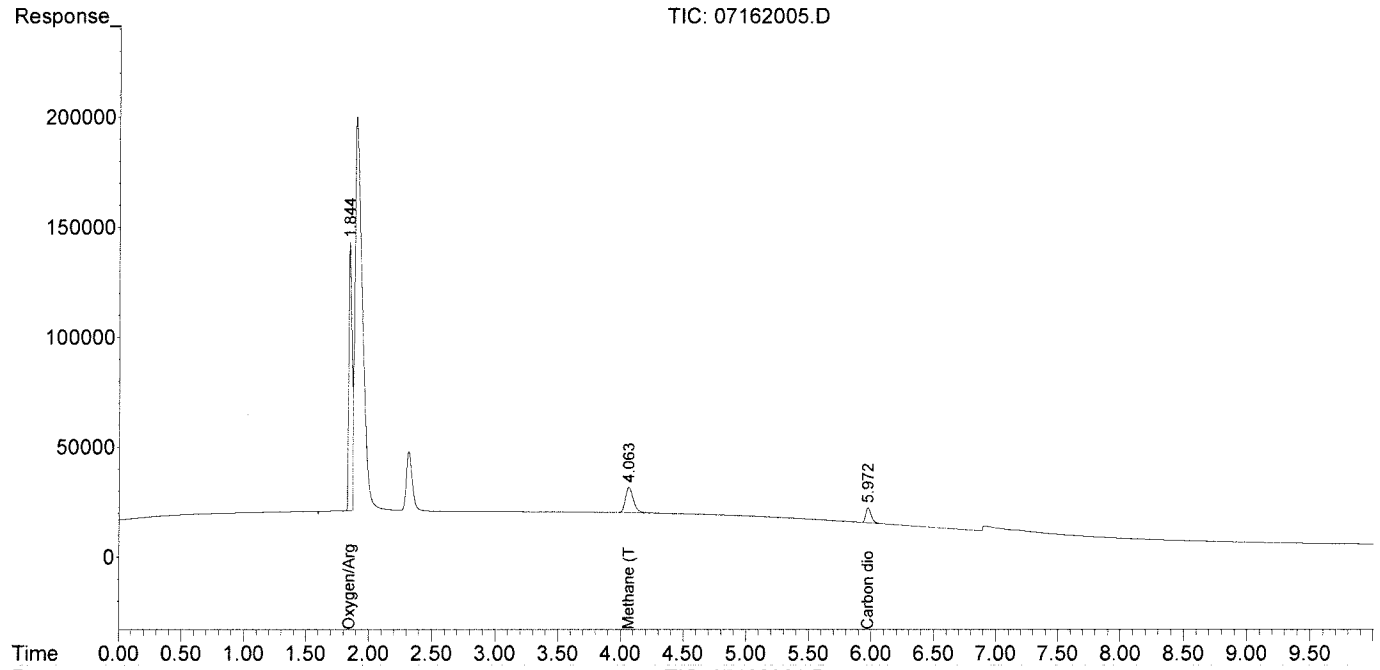
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.846	2108405	0.443	ppm
2)	Carbon monoxide	1.846	2108405	N.D.	ppm
3)	Methane (TCD)	4.064f	529453	55983.246	ppm
4)	Carbon dioxide	5.972	218766	931.993	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

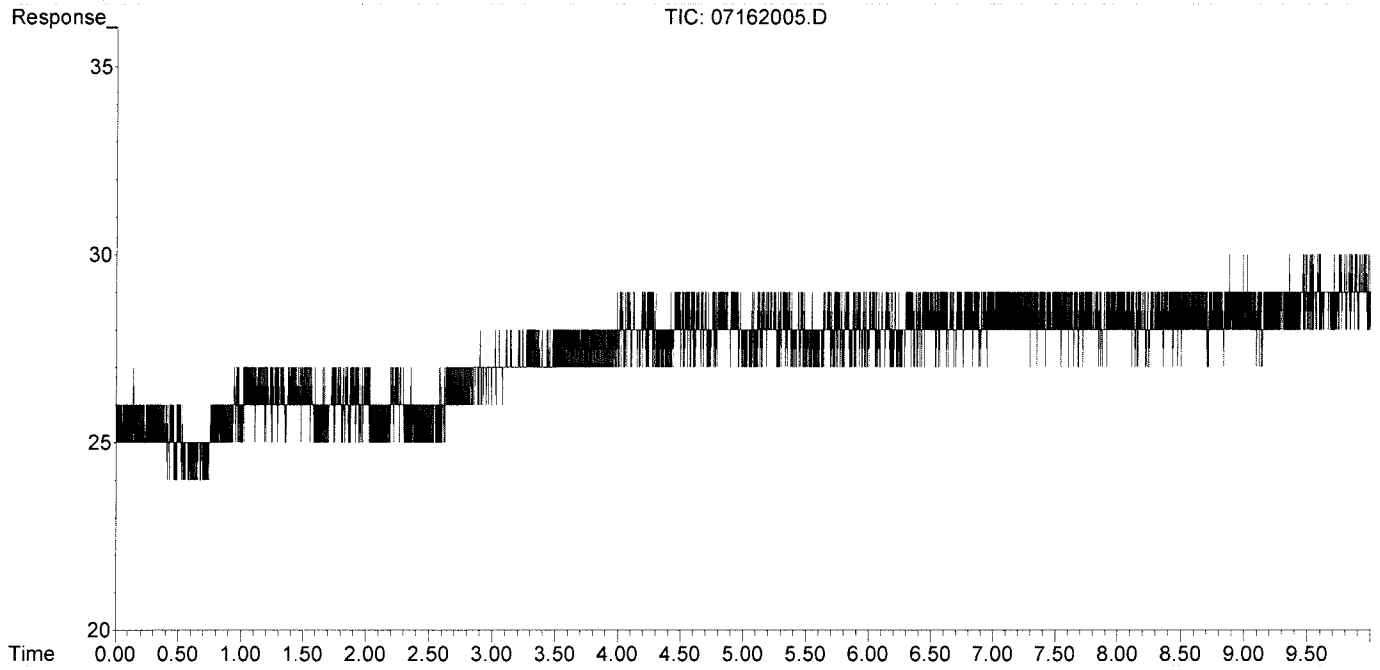
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162005.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 12:20:16
Operator : LD
Sample : LCSD S32-07072004
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 12:32:27 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Response Factor Report HP5890

Method Path : I:\GC10\METHODS\
Method File : RS082817_CO2.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Tue Aug 29 16:13:13 2017
Response Via : Initial Calibration

Calibration Files
1 =08291715.D 2 =08291716.D 3 =08291717.D
4 =08291719.D 5 =08291720.D 6 =08291721.D

	Compound	1	2	3	4	5	6	Avg	%RSD
1)	Oxygen/Argon	4.760						4.760 E6	0.00
2)	Carbon monoxide	2.775		1.066	0.043	0.033	0.027	0.657 E6	170.12
3)	Methane (TCD)							9.457	0.00
4)	Carbon dioxide	2.717	2.193	2.338	2.272	2.265	2.298	2.347 E2	7.99

Signal #2 Calibration Files
1 =08291715.D 2 =08291716.D 3 =08291717.D
4 =08291719.D 5 =08291720.D 6 =08291721.D

	Compound	1	2	3	4	5	6	Avg	%RSD
6)	Methane (FID)	1.253	1.160	1.005	0.927	0.848	0.848	0.945 E4	15.85
7)	Ethylene	1.677	1.605	1.900	1.749	1.597	1.579	1.684 E4	7.30
8)	Ethane	1.769	1.631	1.866	1.767	1.639	1.667	1.723 E4	5.40
9)	Propylene	2.402	2.309	2.767	2.551	2.331	2.333	2.449 E4	7.32
10)	Propane	2.906	2.737	2.817	2.639	2.410	2.420	2.655 E4	7.75
11)	Isobutylene							0.000	-1.00
12)	Isobutane							0.000	-1.00
13)	n-Butane							0.000	-1.00

(#) = Out of Range ### Number of calibration levels exceeded format ###

RS082817_CO2.M Wed Aug 30 13:24:19 2017

Calibration Status Report HP5890

Method Path : I:\GC10\METHODS\
Method File : RS082817_CO2.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Tue Aug 29 16:13:13 2017
Response Via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	1	0	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291715.D
2	2	0	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291716.D
3	3	3	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291717.D
4	4	10	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291719.D
5	5	25	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291720.D
6	6	125	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291721.D
7	7	5000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241708.D
8	8	25000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241709.D
9	9	2000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241710.D
10	10	30000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241711.D

#	ID	Update Time	Quant Time	Acquisition Time
1	1	Aug 29 14:21 2017	Aug 29 14:20 2017	29-Aug-2017, 14:07
2	2	Aug 29 14:52 2017	Aug 29 14:51 2017	29-Aug-2017, 14:22
3	3	Aug 29 15:04 2017	Aug 29 15:04 2017	29-Aug-2017, 14:53
4	4	Aug 29 15:36 2017	Aug 29 15:36 2017	29-Aug-2017, 15:23
5	5	Aug 29 15:57 2017	Aug 29 15:57 2017	29-Aug-2017, 15:44
6	6	Aug 29 16:13 2017	Aug 29 16:13 2017	29-Aug-2017, 16:00
7	7	Aug 25 09:05 2017	Aug 24 16:00 2017	24-Aug-2017, 15:44
8	8	Aug 25 09:06 2017	Aug 24 16:13 2017	24-Aug-2017, 16:02
9	9	Aug 25 09:06 2017	Aug 24 16:31 2017	24-Aug-2017, 16:16
10	10	Aug 25 09:07 2017	Aug 24 16:42 2017	24-Aug-2017, 16:33

RS082817_CO2.M Wed Aug 30 13:24:30 2017

dit Compounds -- Compound #4 -- Carbon dioxide

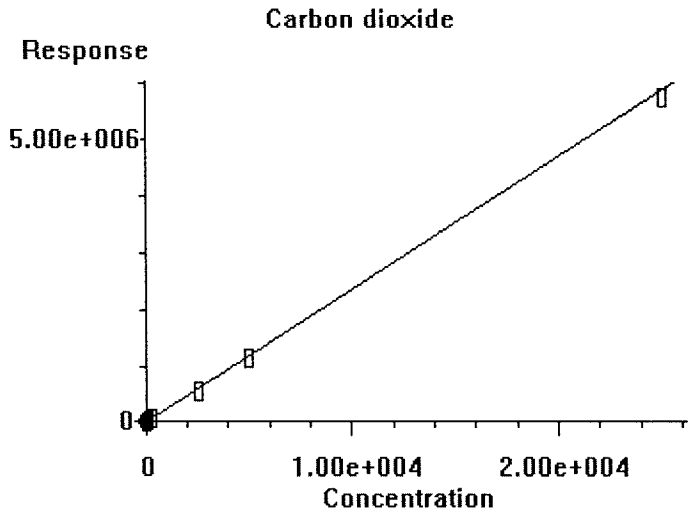
Search by: Ret Time Name Index Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	25.000000	6793.665186
2	100.000000	21932.418000
3	250.000000	58460.642510
4	2500.000000	568043.388750
5	5000.000000	1132363.215937
6	25000.000000	5744294.891563
7	25000.000000	
8	25000.000000	
9	2000.000000	
10	30000.000000	

Lvl ID	Concentration	Response



0.000e+000	Quadratic term
2.347e+002	Linear term
0.000e+000	Constant term
7.987%	RF Rel Std Dev

OK Cancel Help Print Calibration Curve Copy Calibration Curve

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:07
Operator : MC
Sample : 25ppm s32-08291701 0.25ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:20:06 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

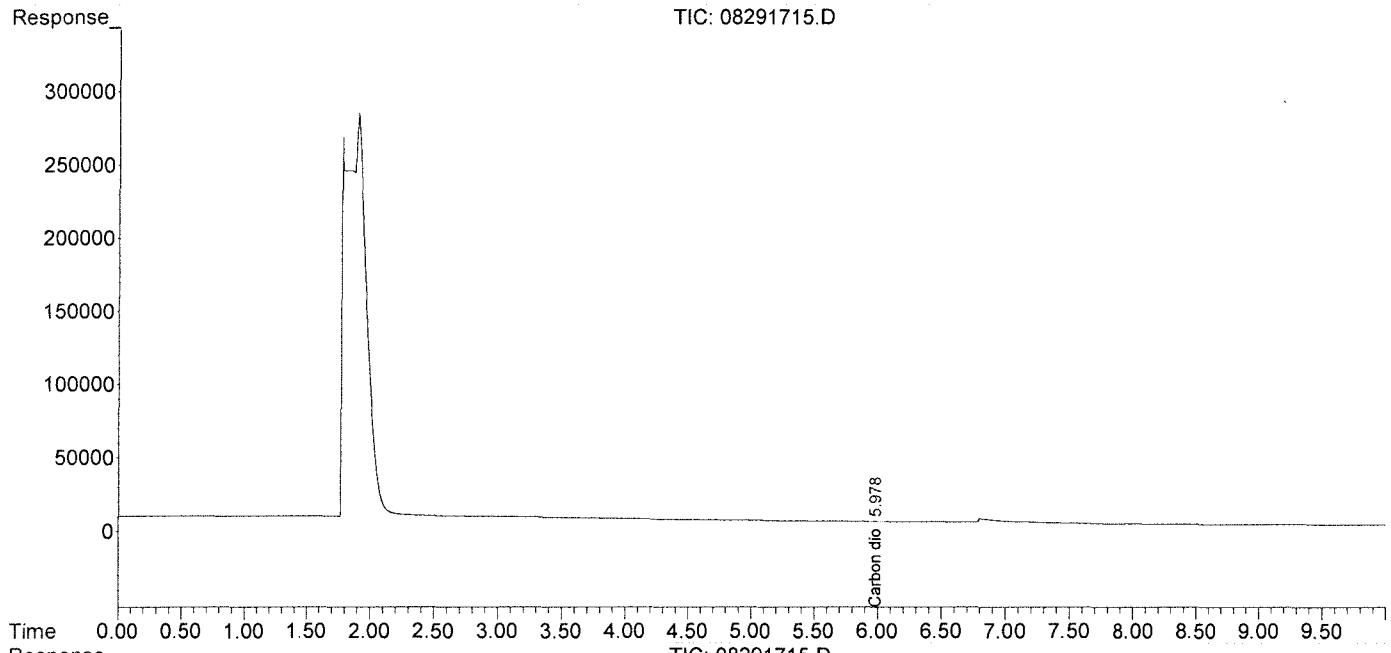
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.776	277465	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	5.978	6794	27.870	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

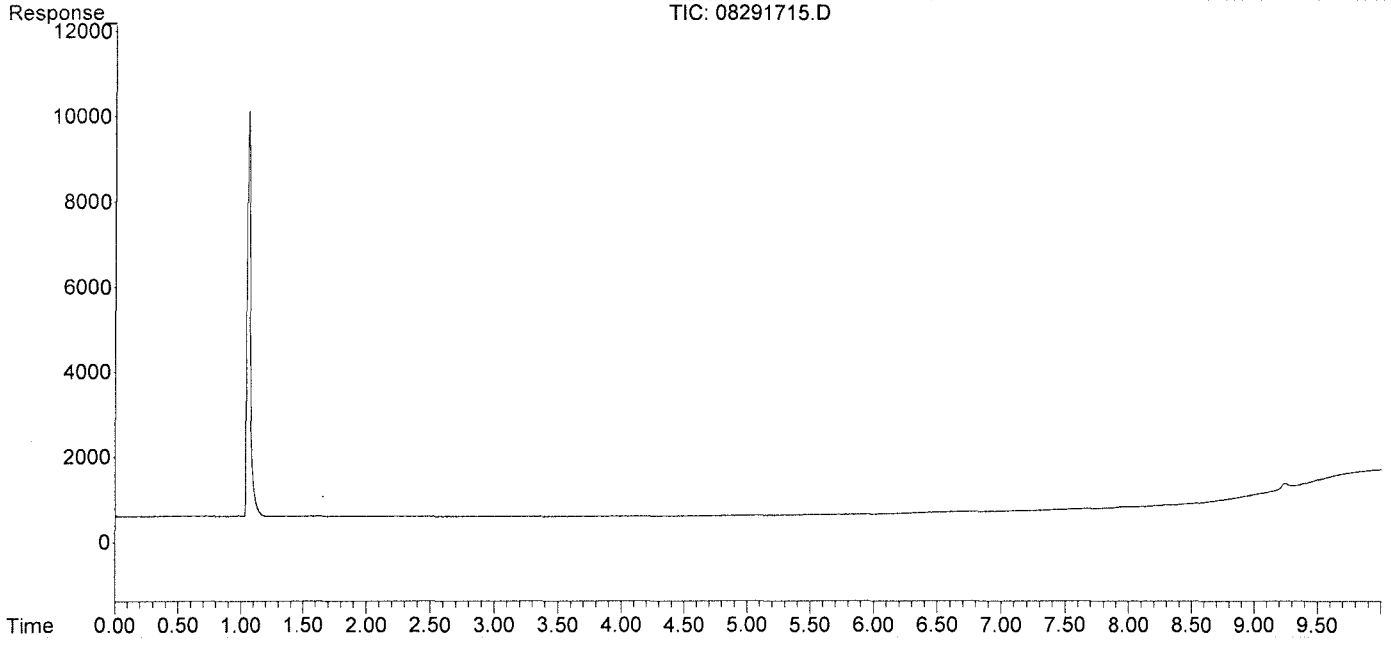
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:07
Operator : MC
Sample : 25ppm s32-08291701 0.25ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:20:06 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

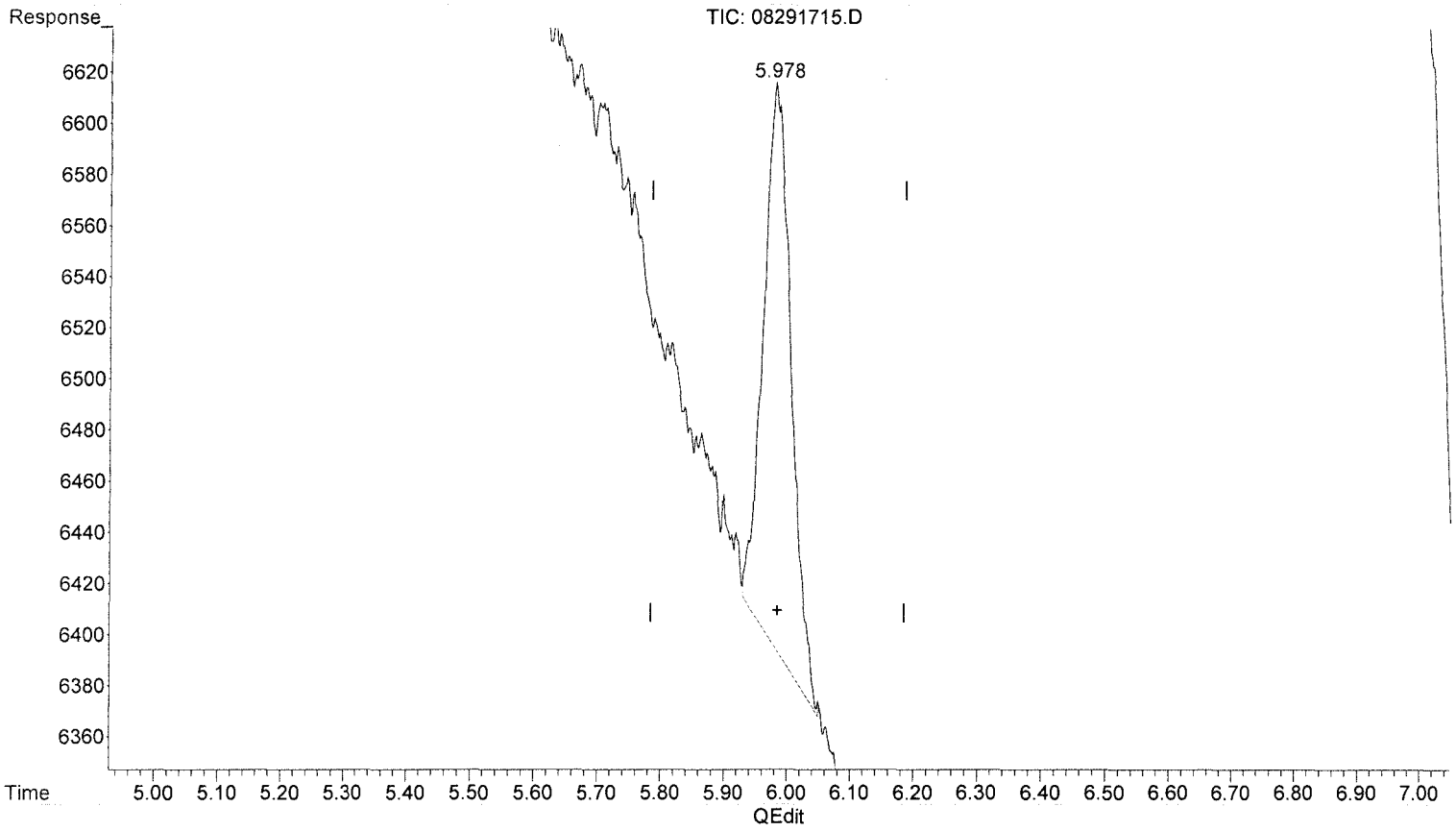




Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:07
Operator : MC
Sample : 25ppm s32-08291701 0.25ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:20:06 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.978min 27.870 ppm m

response 6794

M 9/30/17
BLV
M.
pr/w

9/4/17

(+) = Expected Retention Time
RS082817_CO2.M Wed Aug 30 13:17:47 2017

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291716.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:22
Operator : MC
Sample : 100ppm s32-08291702 0.2ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:51:38 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:21:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

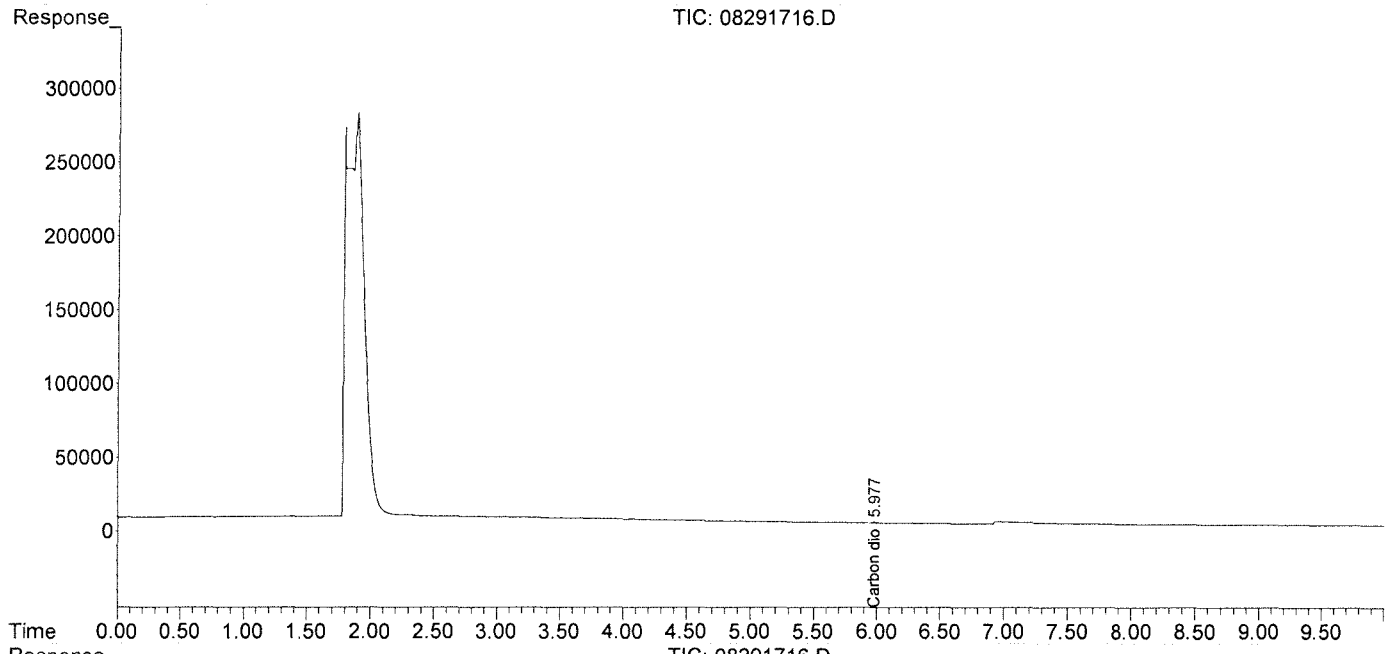
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.790	-598962	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	d
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	5.978	21932	87.858	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

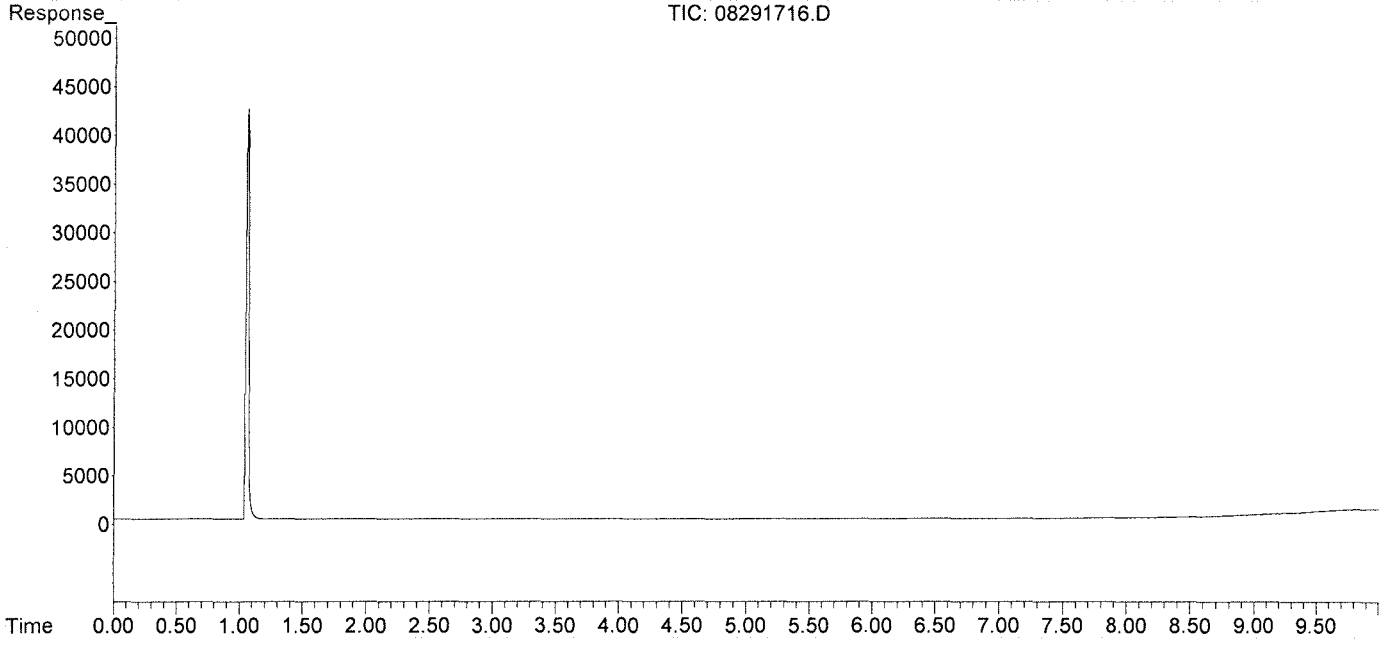
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291716.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:22
Operator : MC
Sample : 100ppm s32-08291702 0.2ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:51:38 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:21:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

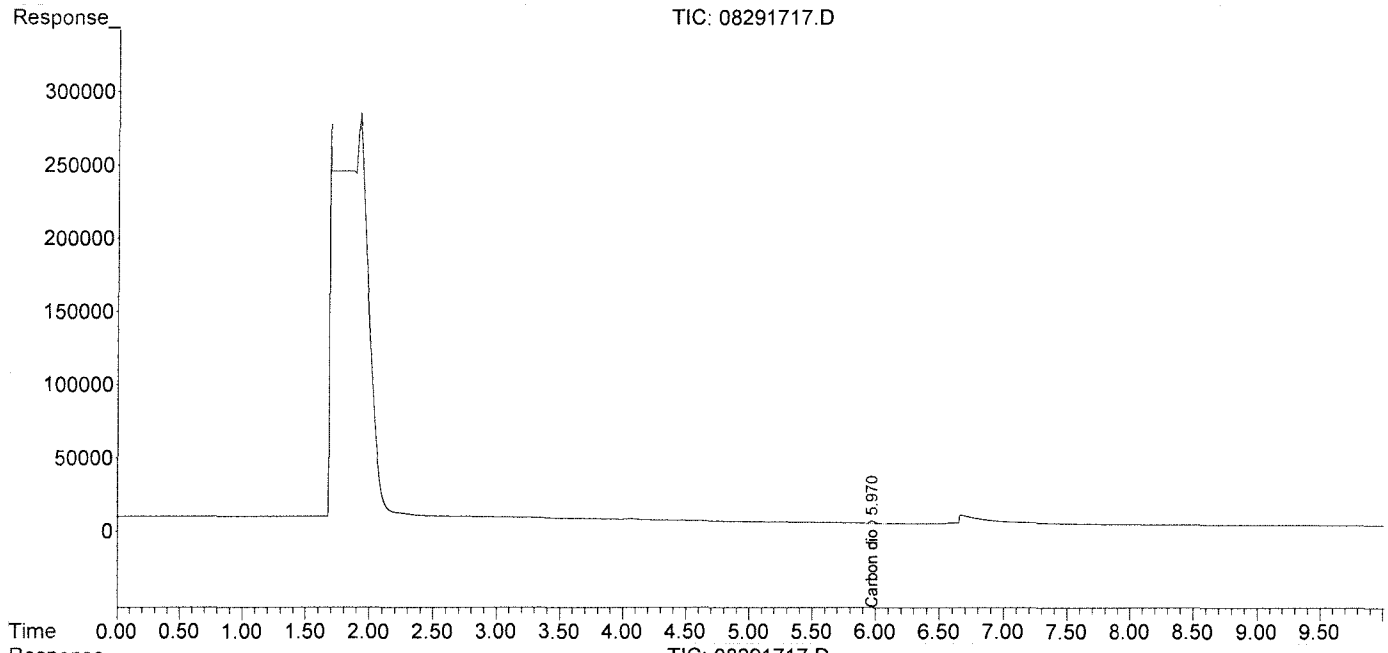
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.920f	-30716454	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	d
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.970	58461	240.204	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

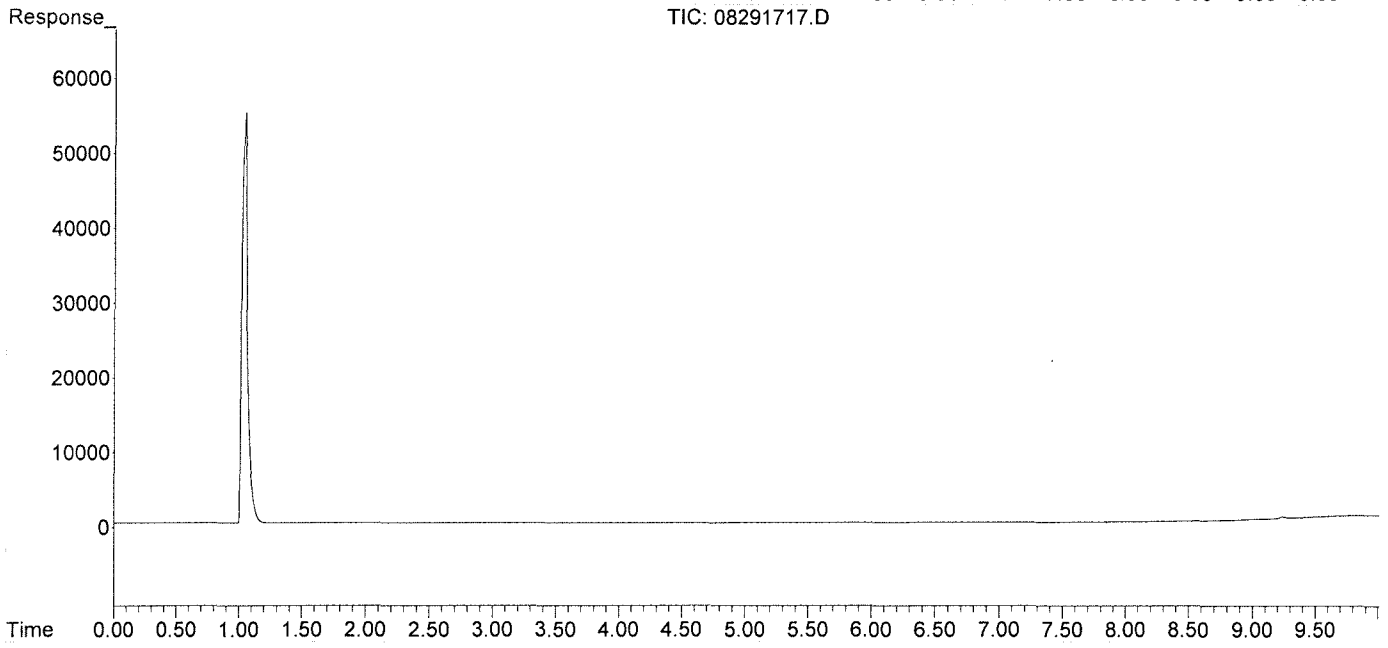
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

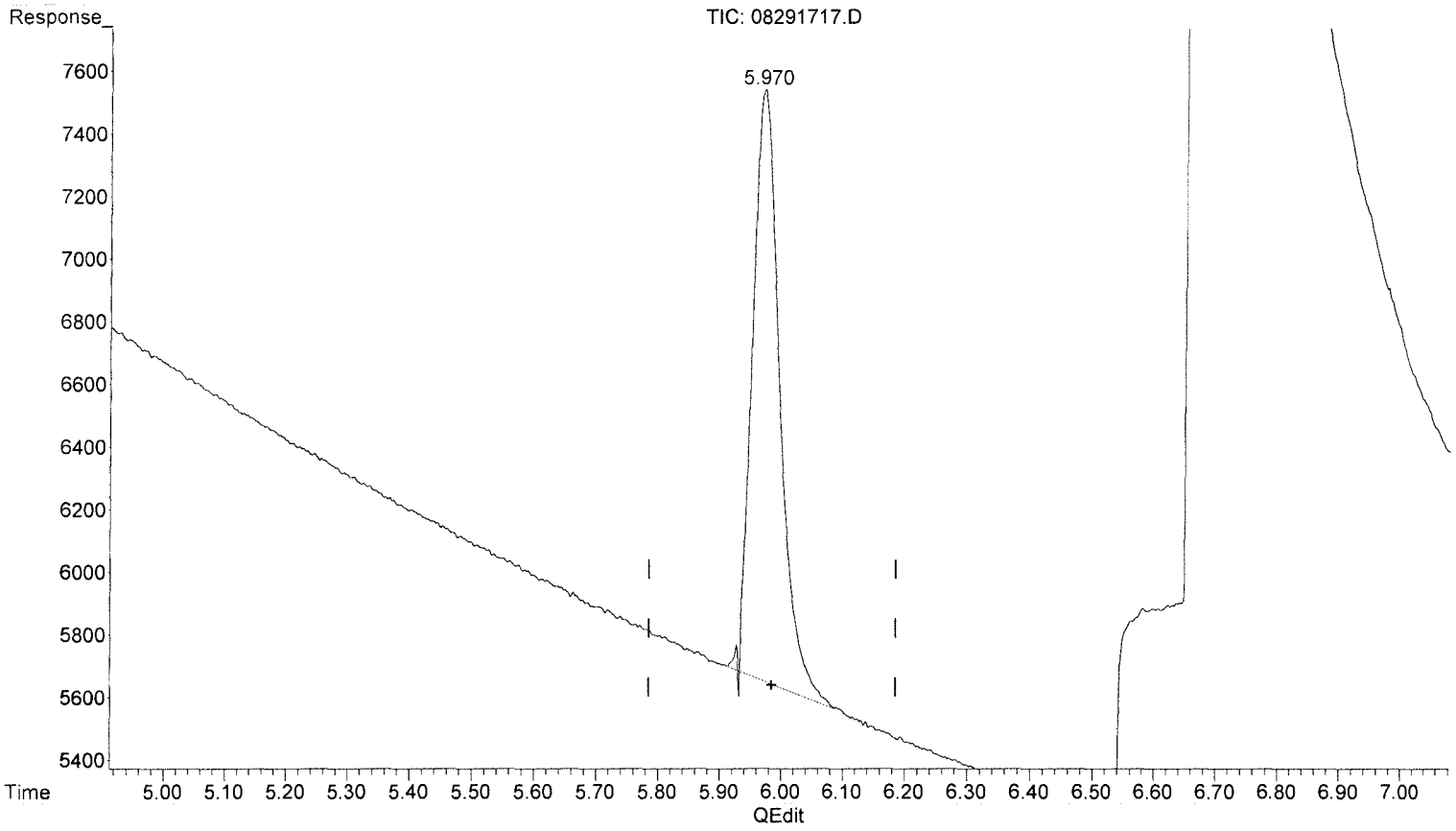




Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.970min 240.204 ppm m

response 58461

(+) = Expected Retention Time

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291719.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:23
Operator : MC
Sample : 2500ppm s32-08231701 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:35:50 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:04:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

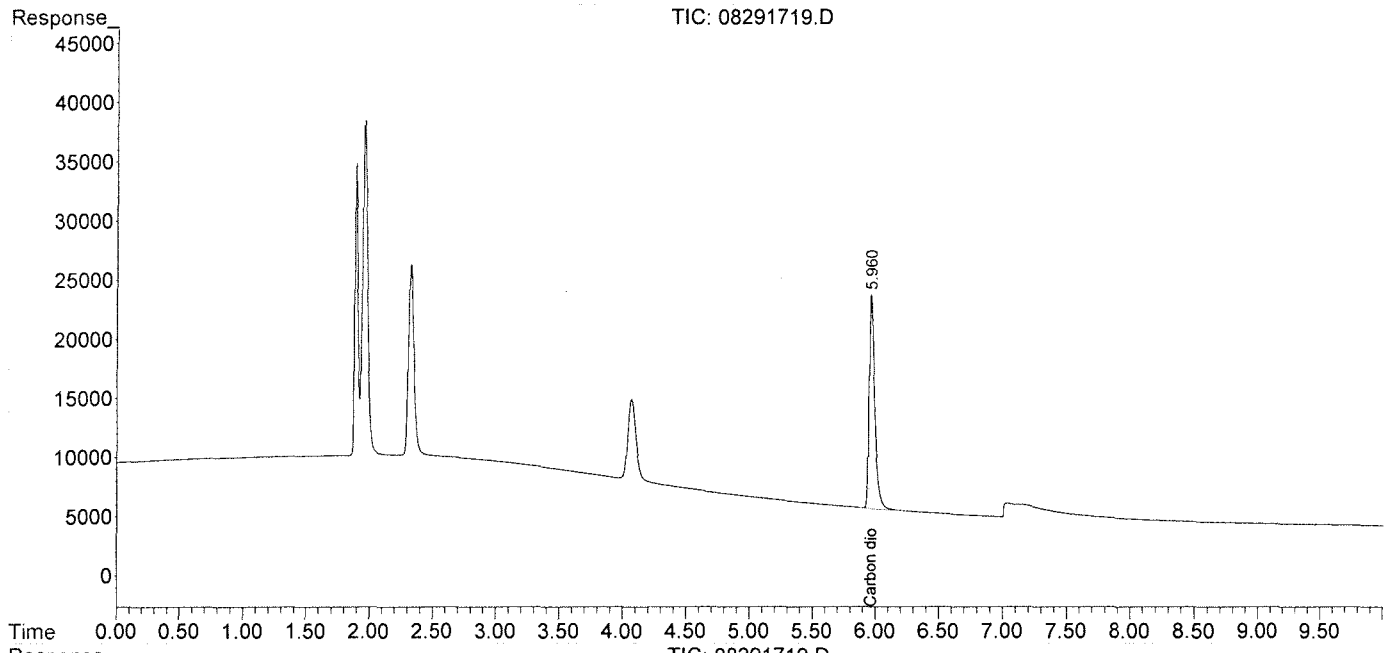
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.891	425113	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.962	568043	2369.673	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

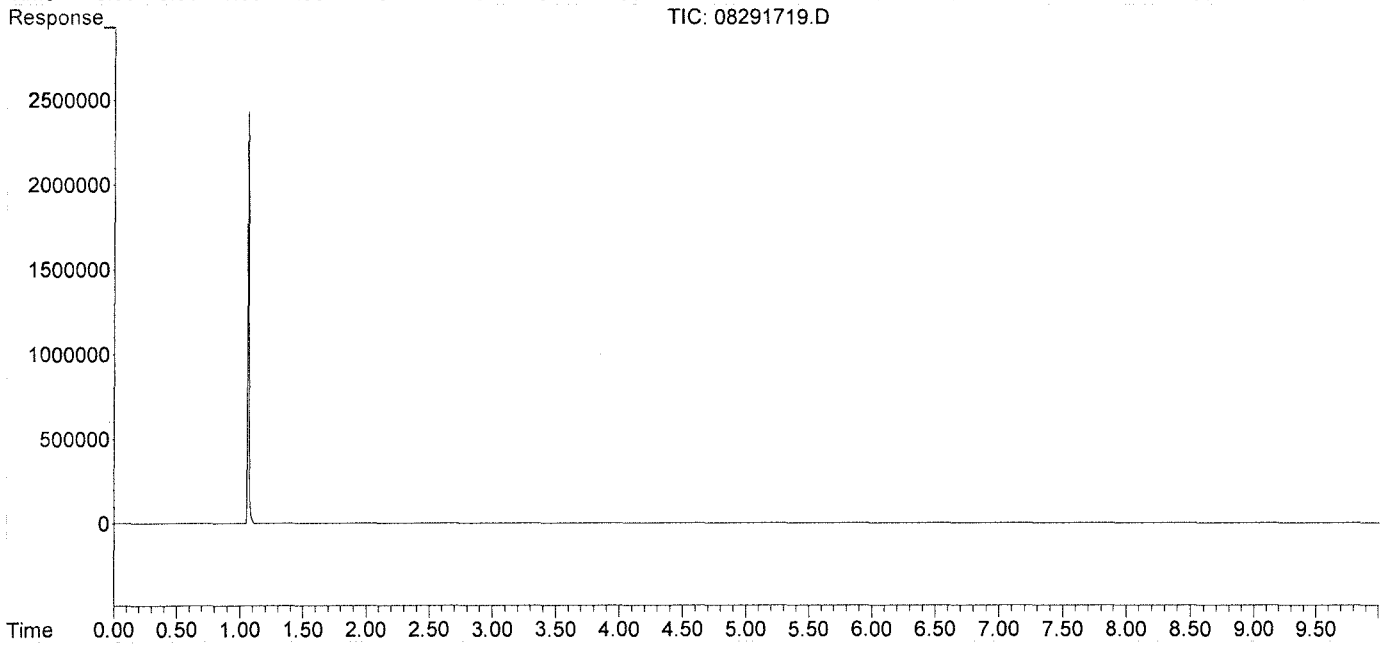
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291719.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:23
Operator : MC
Sample : 2500ppm s32-08231701 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:35:50 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:04:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291720.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:44
Operator : MC
Sample : 5000ppm s32-08231701 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:57:17 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:36:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

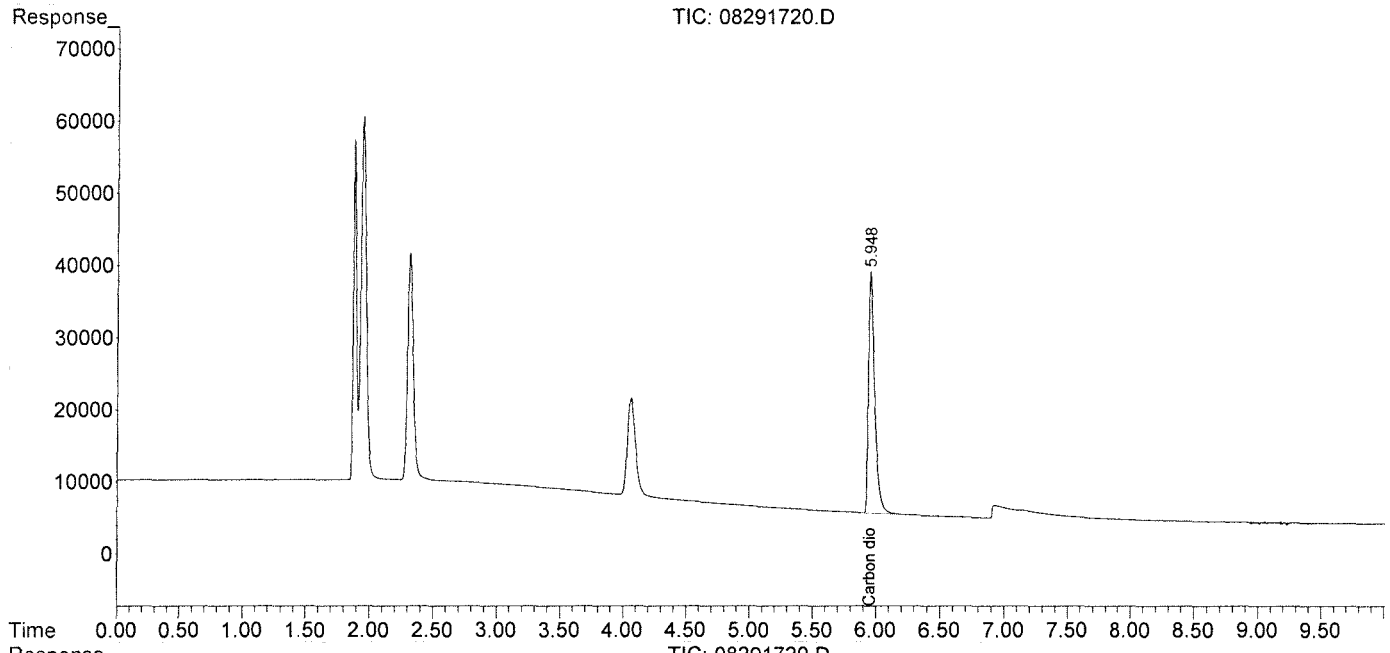
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.880	819221	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.948	1132363	4753.126	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

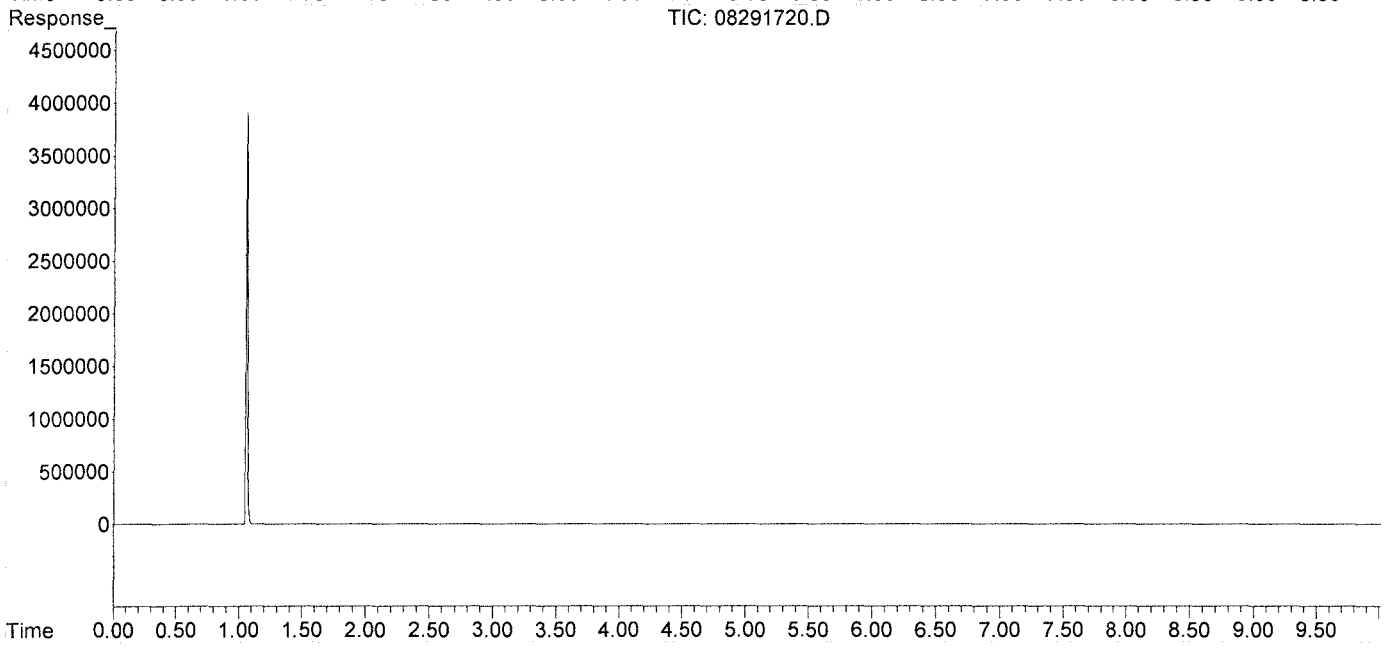
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291720.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:44
Operator : MC
Sample : 5000ppm s32-08231701 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:57:17 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:36:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291721.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:00
Operator : MC
Sample : 25000ppm s32-08231701 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:12:53 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:57:37 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

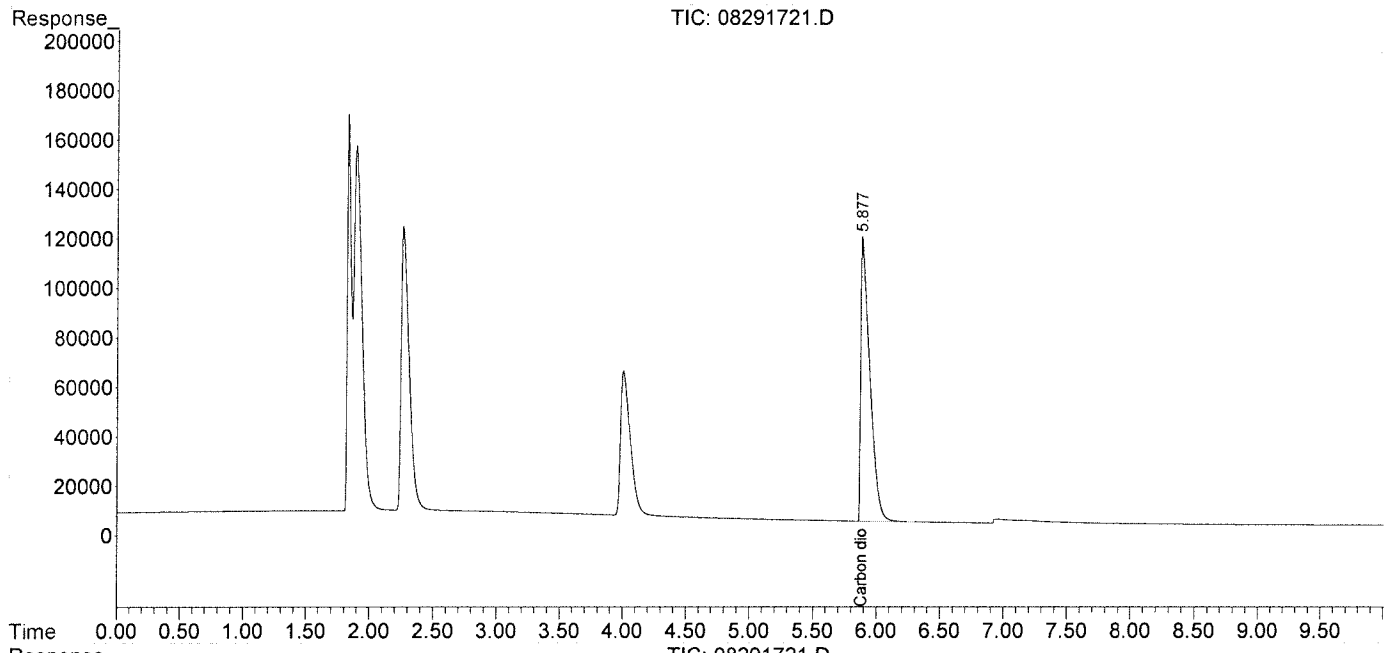
	Compound	R.T.	Response	Conc	Units	
Target	Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.827	3325463	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.879f	5744295	24443.288	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

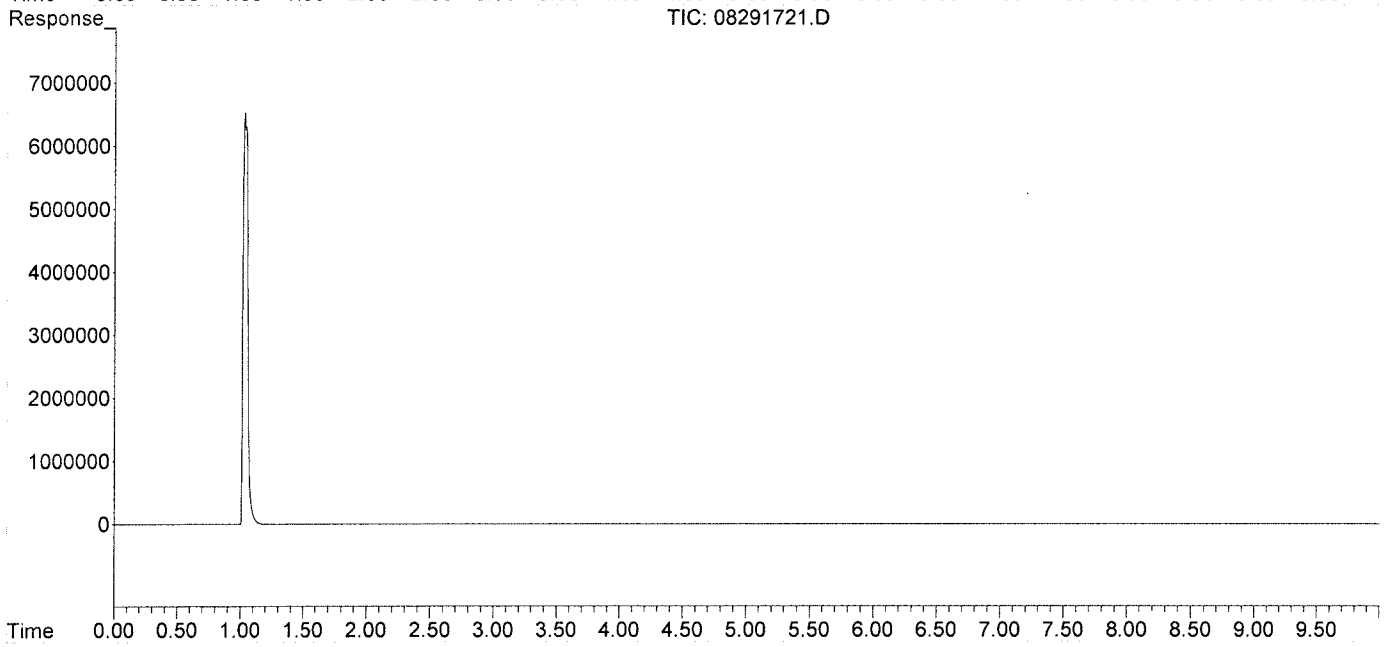
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291721.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:00
Operator : MC
Sample : 25000ppm s32-08231701 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:12:53 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:57:37 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291723.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:35
Operator : MC
Sample : icv s30-07071701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:54:07 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.886	536422	0.113	ppm	actual %D
2)	Carbon monoxide	1.886	536422	N.D.	ppm	
3)	Methane (TCD)	4.059f	626500	66244.710	ppm	
4)	Carbon dioxide	5.947	1163775	4957.948	ppm	5000 99.16
6)	Methane (FID)	1.062	37290742	3947.023	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

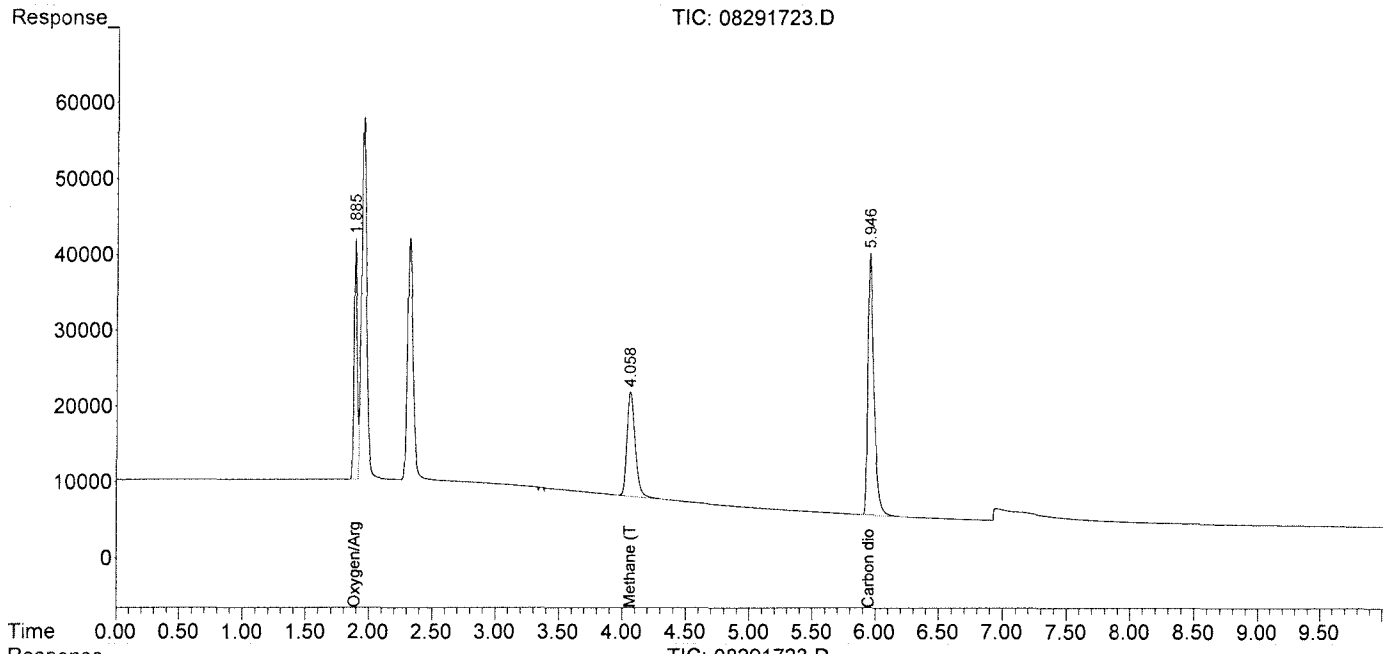
(f)=RT Delta > 1/2 Window (m)=manual int.

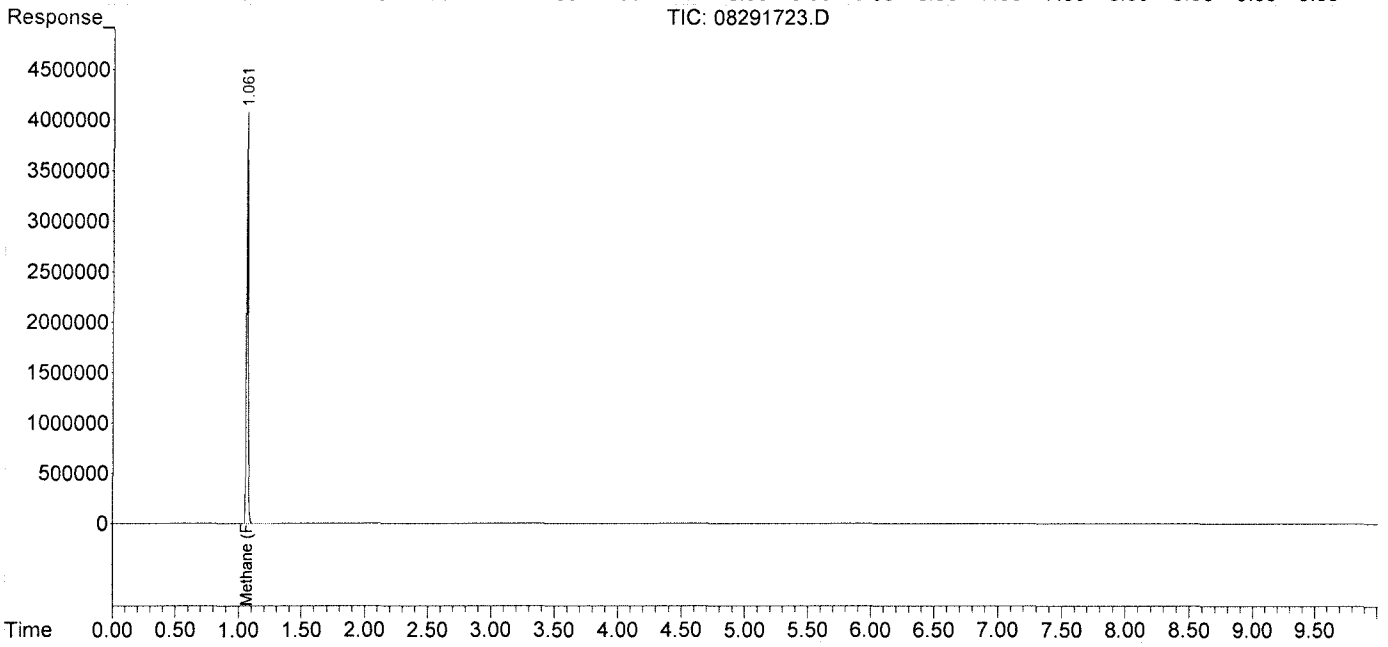
W 9/4/17

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291723.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:35
Operator : MC
Sample : icv s30-07071701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:54:07 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Dissolved Gases by RSK175

ALS Environmental

Method : RSK175 Headspace Method for Dissolved Hydrocarbon in Water by FID/TCD
Client : ALS Laboratory Group | Analyst : LD | Instrument : GC#10
Service Request: P2003888 | Date Analysis : 07/16/20 | Detector : FID#10, TCD#10
Sample Vol. (ml) : 32.00 ml | Head Space Vol.(ml) : 8.00 ml | Gas Constant : 24.05684 (20°C)

HEAD SPACE RESULT (ppm)

Sample ID	Inj. Vol.	Carbon Dioxide
STD S32-06222001	0.100	4855.000
ACTUAL		5000.00
%Difference		2.9%
MCS 0.1ml	0.100	0.000
RB 0.1ml	0.100	0.000
LCS S32-07072004	0.100	904.777
LCSD S32-07072004	0.100	931.993
P2003888-001 0.1ml	0.100	3887.258
P2003888-002 0.1ml	0.100	3313.996
P2003888-003 0.1ml	0.100	3914.766
P2003888-004 0.1ml	0.100	3680.464
P2003888-005 0.1ml	0.100	4509.817
P2003888-006 0.1ml	0.100	6573.325
P2003888-001 MS 0.1ml	0.100	5046.581
P2003888-001 MSD 0.1r	0.100	4944.162
STD S32-06222001		4644.536
ACTUAL		5000.00
%Difference		7.1%

WWt.	44.10
HENRY'S CONSTANT	1.42E+03
RL	100.00
MCS 0.1ml	0.000
LCS S32-07072004	9047.770
LCSD S32-07072004	9319.930
P2003888-001 0.1ml	38872.580
P2003888-002 0.1ml	33139.960
P2003888-003 0.1ml	39147.660
P2003888-004 0.1ml	36804.640
P2003888-005 0.1ml	45098.170
P2003888-006 0.1ml	65733.250
P2003888-001 MS 0.1ml	50465.810
P2003888-001 MSD 0.1ml	49441.620
15:07:08	

FINAL HEAD SPACE RESULT (ppm)

Carbon Dioxide
44.10
1.42E+03
100.00
0.000
9047.770
9319.930
38872.580
33139.960
39147.660
36804.640
45098.170
65733.250
50465.810
49441.620

LP 07/16

Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162001.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 10:39:53
Operator : LD
Sample : STD S32-06222001
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 10:50:28 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

LD 07/16

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

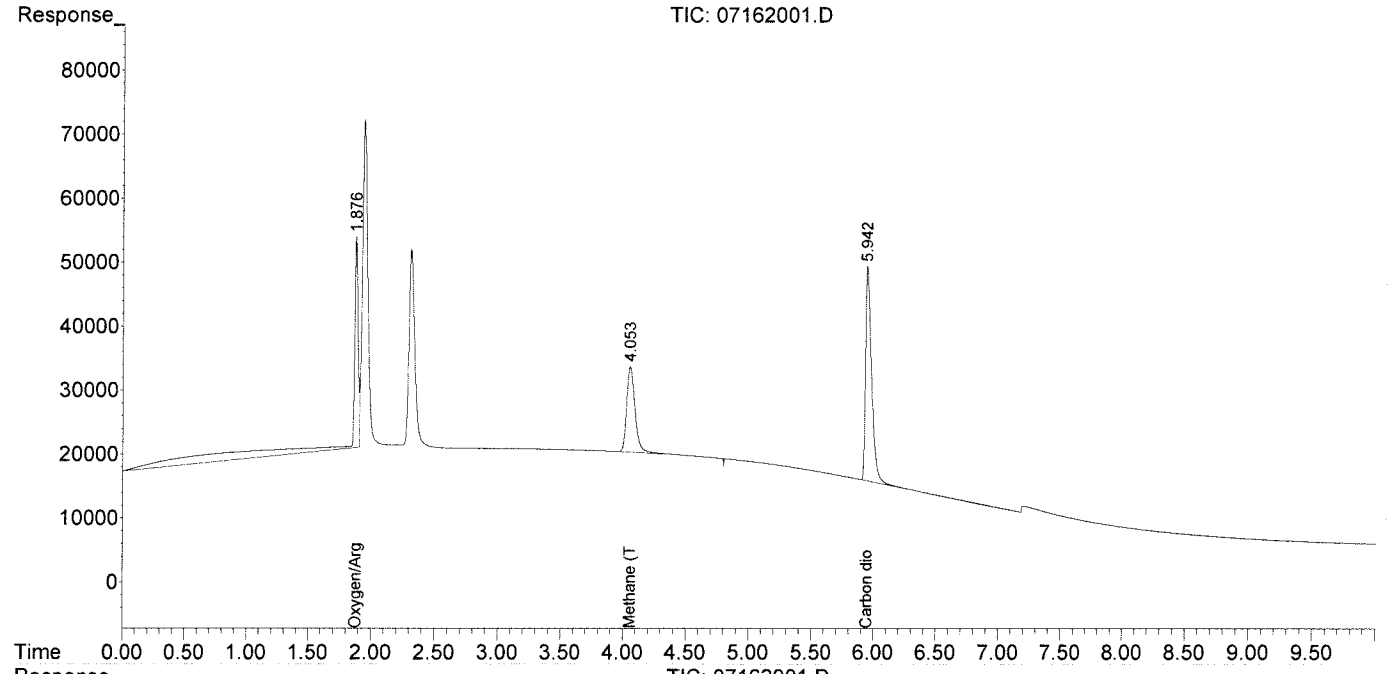
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.877	1502354	0.316	ppm
2)	Carbon monoxide	1.877	1502354	N.D.	ppm
3)	Methane (TCD)	4.054f	615635	65095.876	ppm
4)	Carbon dioxide	5.944	1139610	4855.000	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

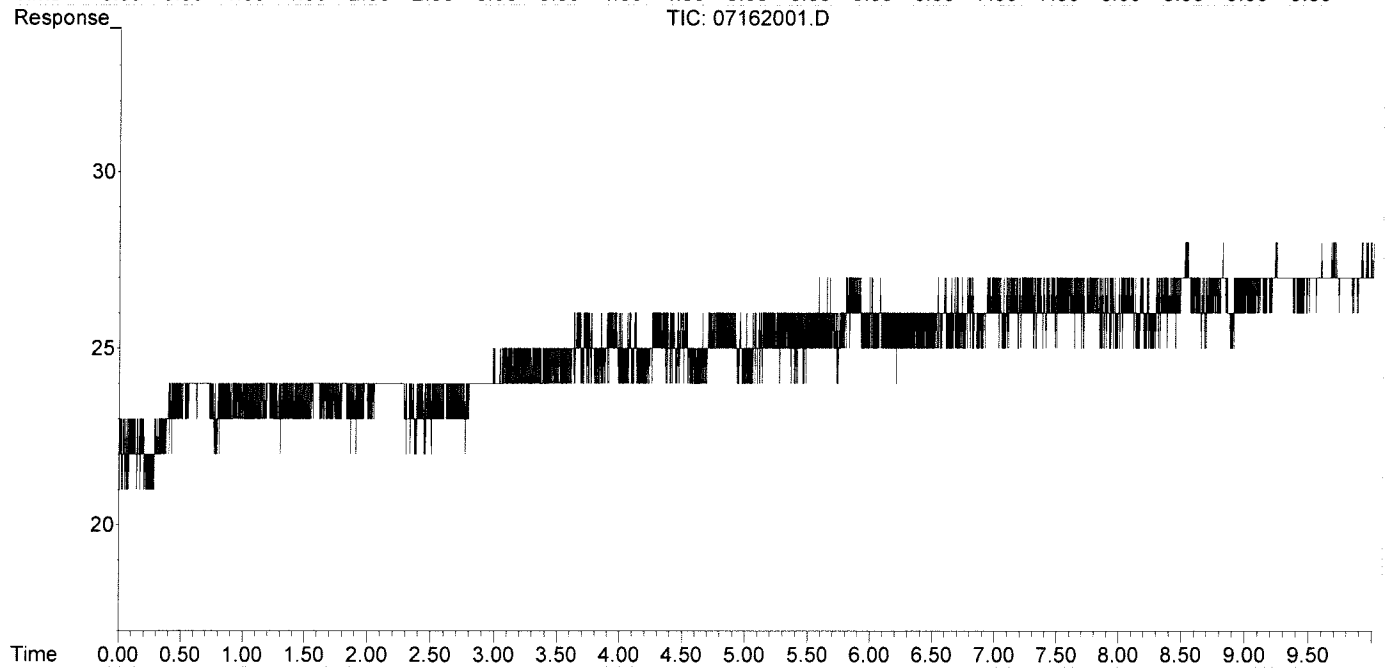
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162001.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 10:39:53
Operator : LD
Sample : STD S32-06222001
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 10:50:28 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162016.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 15:20:21
Operator : LD
Sample : STD S32-06222001
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 15:30:10 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

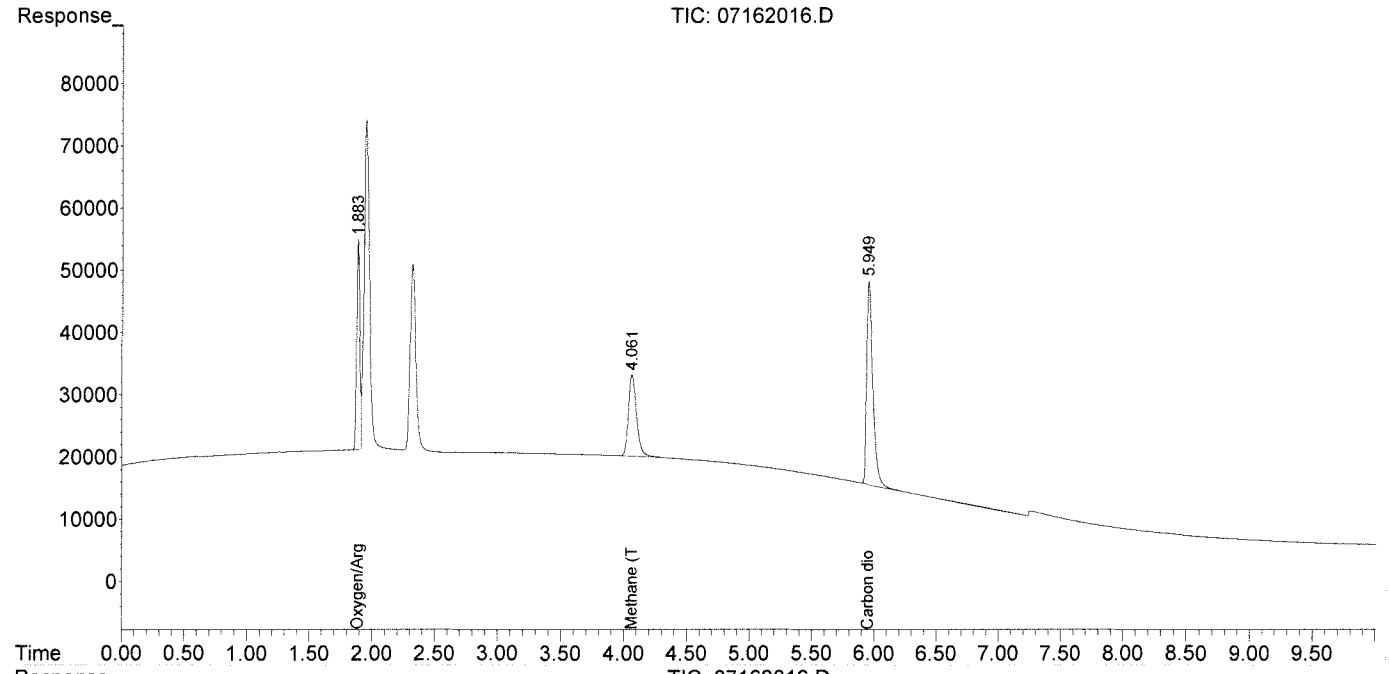
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.884	582452	0.122	ppm
2)	Carbon monoxide	1.884	582452	N.D.	ppm
3)	Methane (TCD)	4.061f	599039	63341.082	ppm
4)	Carbon dioxide	5.951	1090208	4644.536	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

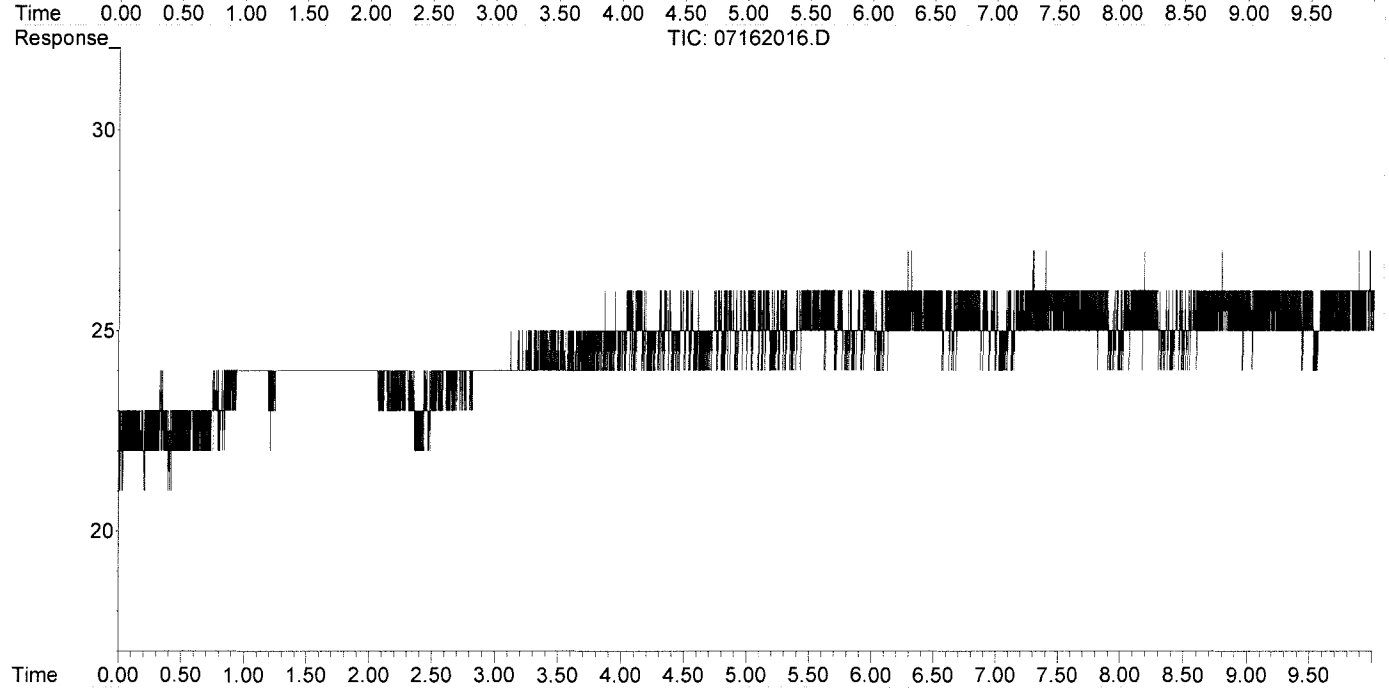
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\16CO2\
Data File : 07162016.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 16-Jul-2020, 15:20:21
Operator : LD
Sample : STD S32-06222001
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 16 15:30:10 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Injection Log

Directory: I:\GC10\DATA\RSK_FID\2017_08\29\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	29-Aug-17, 07:58:00	08291701.D	std s30-06161601		MC	RSKBOTH.M	Pass
2	29-Aug-17, 08:11:02	08291702.D	mb 0.5ml		MC	RSKBOTH.M	Pass
3	29-Aug-17, 08:24:13	08291703.D	4089-001 0.5ml		MC	RSKBOTH.M	
4	29-Aug-17, 08:39:29	08291704.D	4089-002 0.5ml		MC	RSKBOTH.M	
5	29-Aug-17, 08:53:38	08291705.D	4089-003 0.5ml		MC	RSKBOTH.M	
6	29-Aug-17, 09:33:52	08291706.D	4089-004 0.5ml		MC	RSKBOTH.M	
7	29-Aug-17, 09:50:51	08291707.D	4089-005 0.5ml		MC	RSKBOTH.M	
8	29-Aug-17, 10:07:54	08291708.D	4089-006 0.5ml		MC	RSKBOTH.M	
9	29-Aug-17, 10:42:34	08291709.D	4089-007 0.5ml		MC	RSKBOTH.M	
10	29-Aug-17, 11:06:01	08291710.D	4089-008 0.5ml		MC	RSKBOTH.M	
11	29-Aug-17, 11:23:53	08291711.D	4089-009 0.5ml		MC	RSKBOTH.M	
12	29-Aug-17, 11:37:17	08291712.D	lcs s30-05241604		MC	RSKBOTH.M	Pass
13	29-Aug-17, 11:50:31	08291713.D	lcs s30-05241604		MC	RSKBOTH.M	Pass
14	29-Aug-17, 12:29:45	08291714.D	std s30-06161601		MC	RSKBOTH.M	Pass
15	29-Aug-17, 14:07:01	08291715.D	25ppm s32-08291701 0.25ml		MC	RSKBOTH.M	Curve
16	29-Aug-17, 14:22:12	08291716.D	100ppm s32-08291702 0.2ml		MC	RSKBOTH.M	Curve
17	29-Aug-17, 14:53:00	08291717.D	250ppm s32-08291702 0.5ml		MC	RSKBOTH.M	Curve
18	29-Aug-17, 15:07:43	08291718.D	mis inject		MC	RSKBOTH.M	
19	29-Aug-17, 15:23:21	08291719.D	2500ppm s32-08231701 50ul		MC	RSKBOTH.M	Curve
20	29-Aug-17, 15:44:54	08291720.D	5000ppm s32-08231701 0.1ml		MC	RSKBOTH.M	Curve
21	29-Aug-17, 16:00:09	08291721.D	25000ppm s32-08231701 0.5ml		MC	RSKBOTH.M	Curve
22	29-Aug-17, 16:15:43	08291722.D	mb 0.1ml		MC	RSKBOTH.M	Pass
23	29-Aug-17, 16:35:37	08291723.D	icv s30-07071701		MC	RSKBOTH.M	Pass

Injection Log

Directory: I:\GC10\DATA\RSK_TCD\2020_07\16\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	16-Jul-20, 10:39:53	07162001.D	STD S32-06222001		LD	RSKBOTH.M	pass
2	16-Jul-20, 10:53:17	07162002.D	RB 0.1ml		LD	RSKBOTH.M	pass
3	16-Jul-20, 11:25:16	07162003.D	MCS 0.1ml		LD	RSKBOTH.M	pass
4	16-Jul-20, 12:07:21	07162004.D	LCS S32-07072004		LD	RSKBOTH.M	pass
5	16-Jul-20, 12:20:16	07162005.D	LCSD S32-07072004		LD	RSKBOTH.M	pass
6	16-Jul-20, 12:34:40	07162006.D	P2003888-001 0.1ml		LD	RSKBOTH.M	
7	16-Jul-20, 12:48:09	07162007.D	xxxxxP2003888-001 MS		LD	RSKBOTH.M	
8	16-Jul-20, 13:00:59	07162008.D	xxxP2003888-001 MSD		LD	RSKBOTH.M	
9	16-Jul-20, 13:13:48	07162009.D	P2003888-001 MS 0.1ml		LD	RSKBOTH.M	
10	16-Jul-20, 13:27:06	07162010.D	P2003888-001 MSD 0.1ml		LD	RSKBOTH.M	
11	16-Jul-20, 13:39:25	07162011.D	P2003888-002 0.1ml		LD	RSKBOTH.M	
12	16-Jul-20, 14:21:55	07162012.D	P2003888-003 0.1ml		LD	RSKBOTH.M	
13	16-Jul-20, 14:35:50	07162013.D	P2003888-004 0.1ml		LD	RSKBOTH.M	
14	16-Jul-20, 14:52:13	07162014.D	P2003888-005 0.1ml		LD	RSKBOTH.M	
15	16-Jul-20, 15:07:08	07162015.D	P2003888-006 0.1ml		LD	RSKBOTH.M	
16	16-Jul-20, 15:20:21	07162016.D	STD S32-06222001		LD	RSKBOTH.M	pass

Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202006.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 14:08:24
Operator : LD
Sample : P2003888-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 14:34:25 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

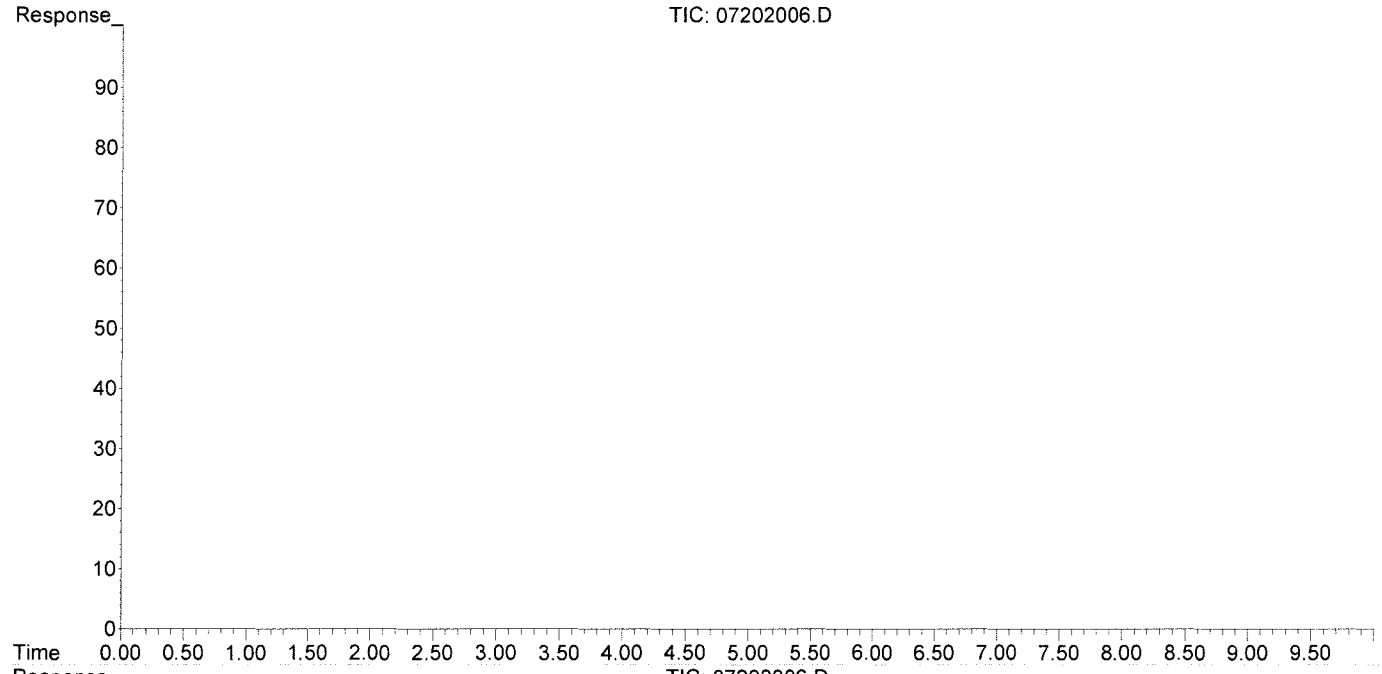
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.099	9186	1.013	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

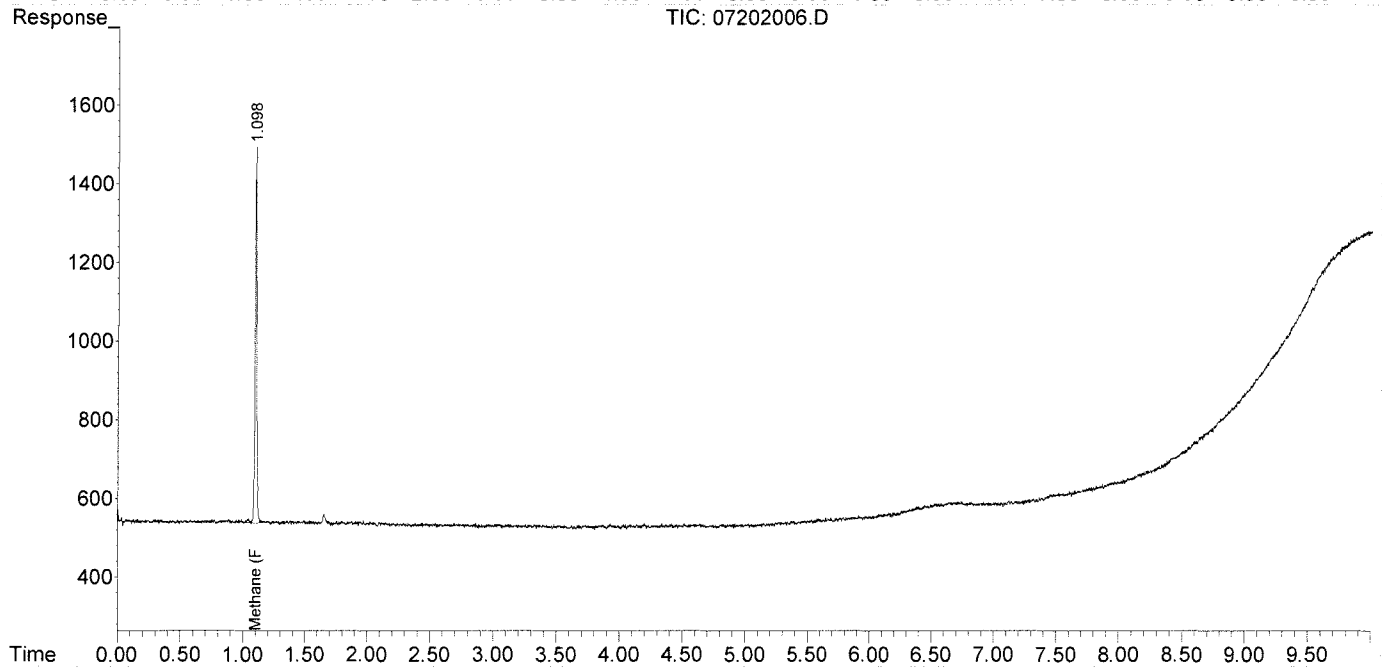
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202006.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 14:08:24
Operator : LD
Sample : P2003888-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 14:34:25 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202008.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 14:37:43
Operator : LD
Sample : P2003888-001 MS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 14:48:10 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

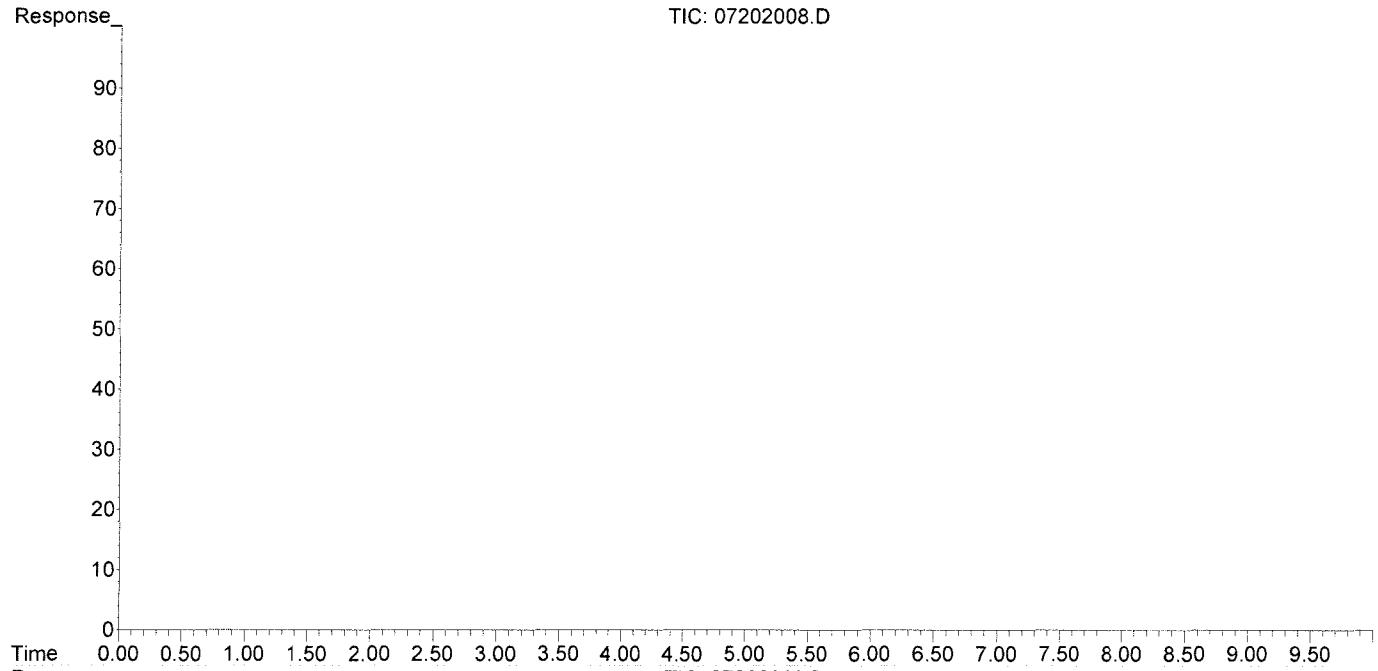
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.097	21717	2.394	ppm
7)	Ethylene	1.665	16606	0.992	ppm
8)	Ethane	1.930	18678	1.102	ppm
9)	Propylene	4.315	22263	0.950	ppm
10)	Propane	4.437	28656	1.152	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.642f	37313	1.402	ppm
13)	n-Butane	6.642f	37313	1.402	ppm

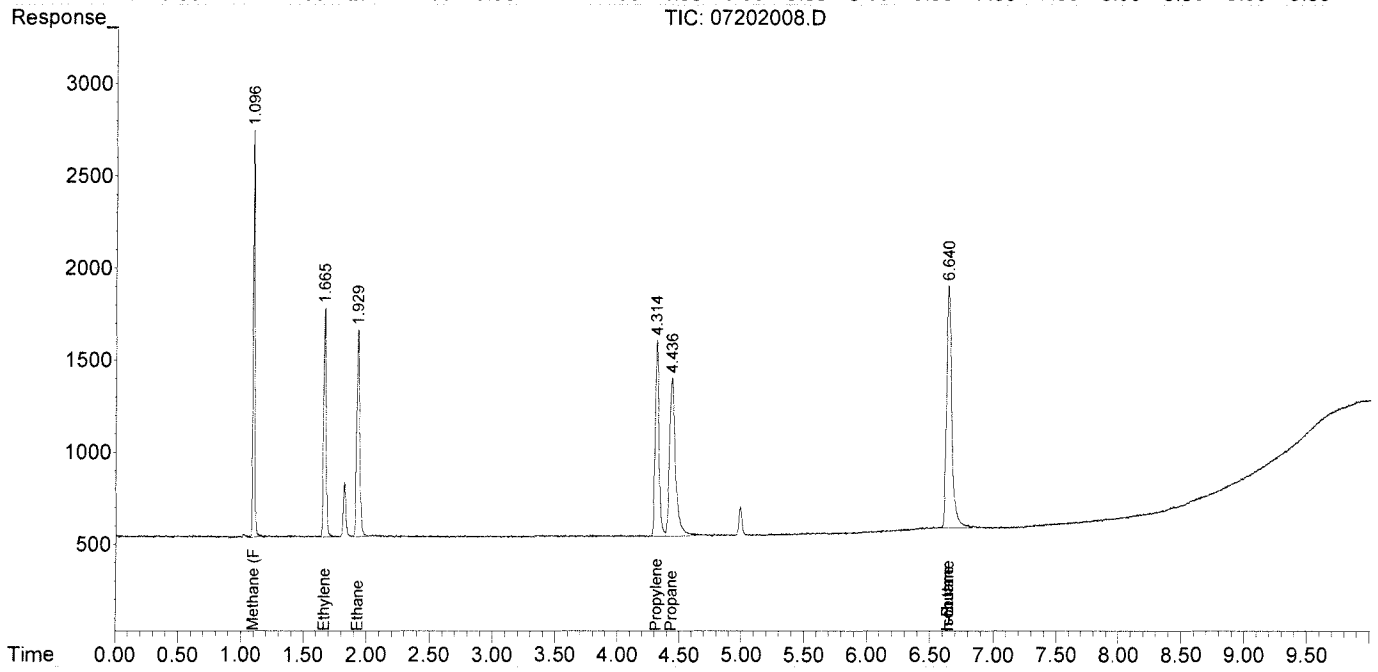
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202008.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 14:37:43
Operator : LD
Sample : P2003888-001 MS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 14:48:10 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202009.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 14:50:46
Operator : LD
Sample : P2003888-001 MSD 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 15:00:44 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

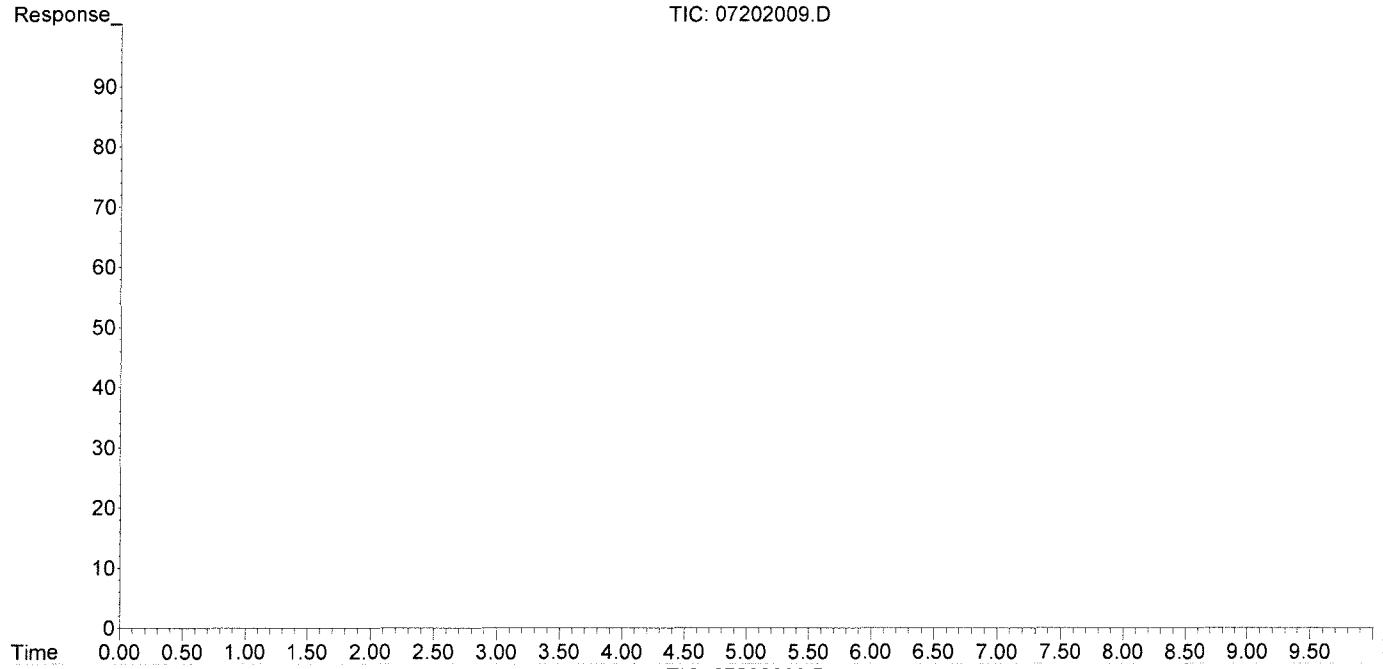
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.097	22375	2.467	ppm
7)	Ethylene	1.659	16920	1.011	ppm
8)	Ethane	1.921	18678	1.102	ppm
9)	Propylene	4.312	21646	0.924	ppm
10)	Propane	4.434	27729	1.115	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.643f	36828	1.384	ppm
13)	n-Butane	6.643f	36828	1.384	ppm

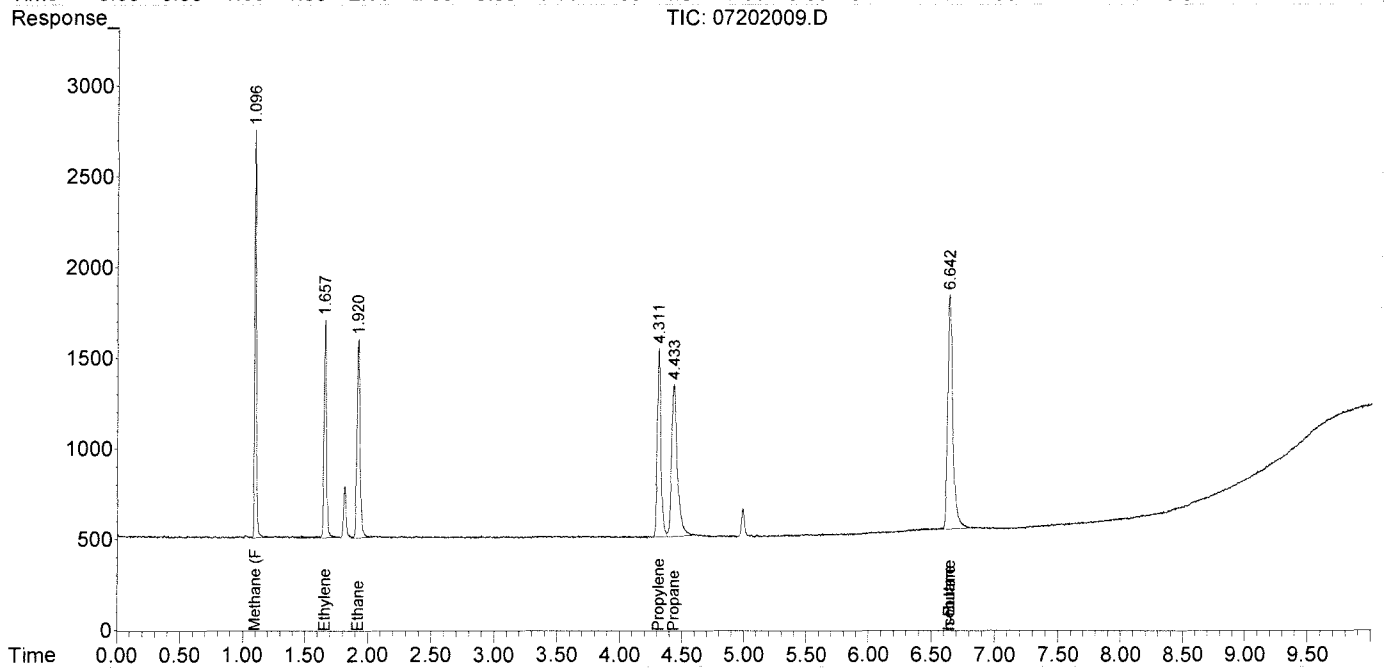
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202009.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 14:50:46
Operator : LD
Sample : P2003888-001 MSD 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 15:00:44 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202010.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 15:06:18
Operator : LD
Sample : P2003888-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 16:38:58 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

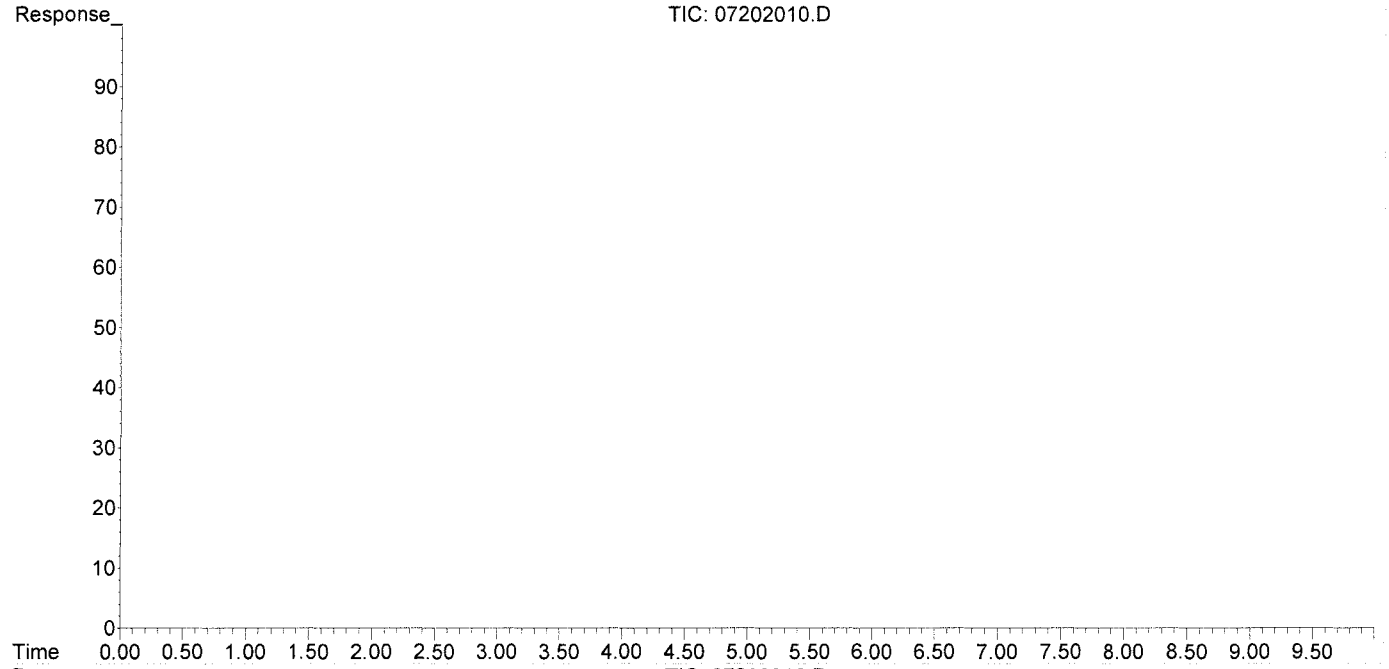
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.104	3098	0.342	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

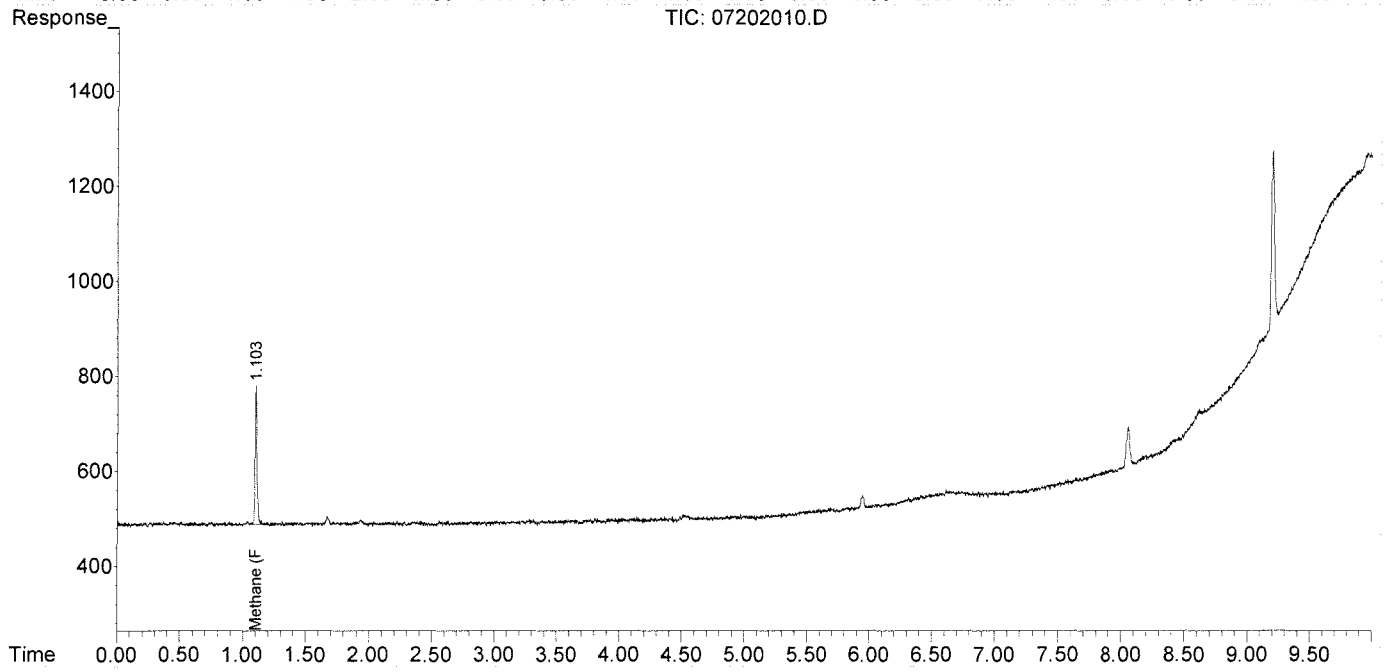
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202010.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 15:06:18
Operator : LD
Sample : P2003888-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 16:38:58 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202011.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 15:21:18
Operator : LD
Sample : P2003888-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 16:39:05 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

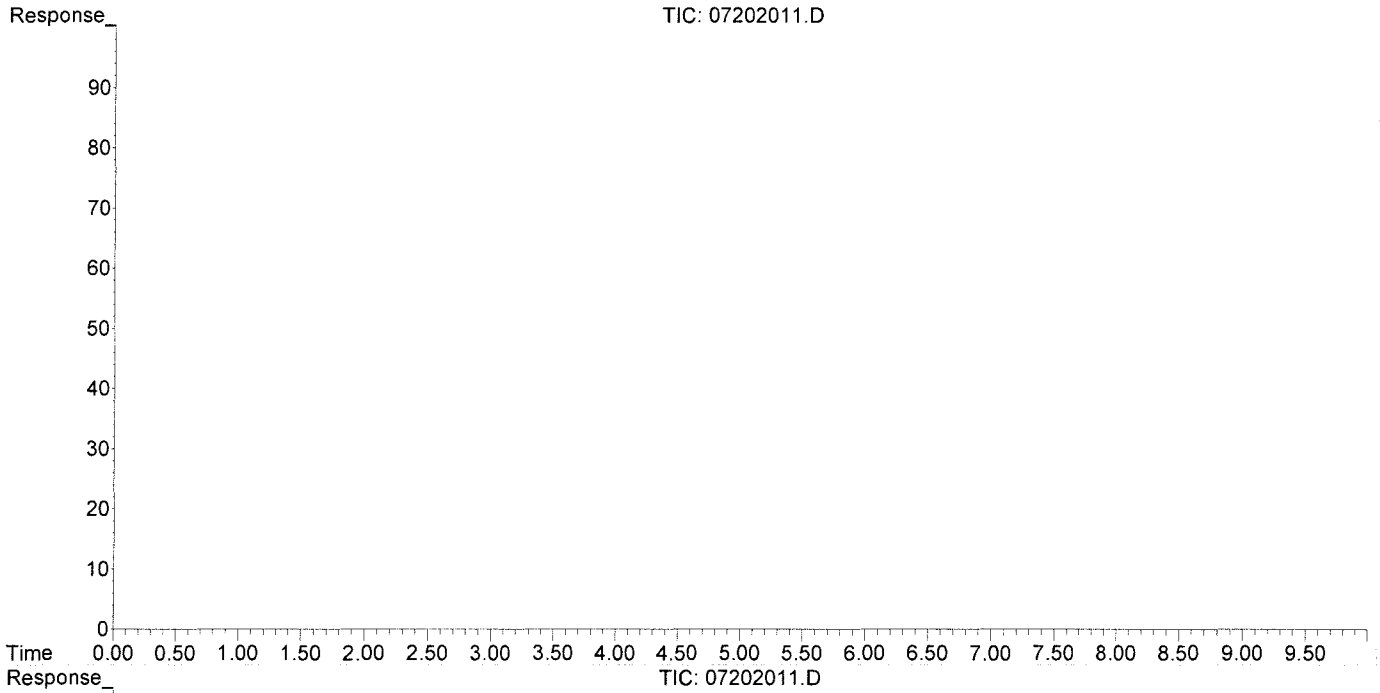
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.104	2222	0.245	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

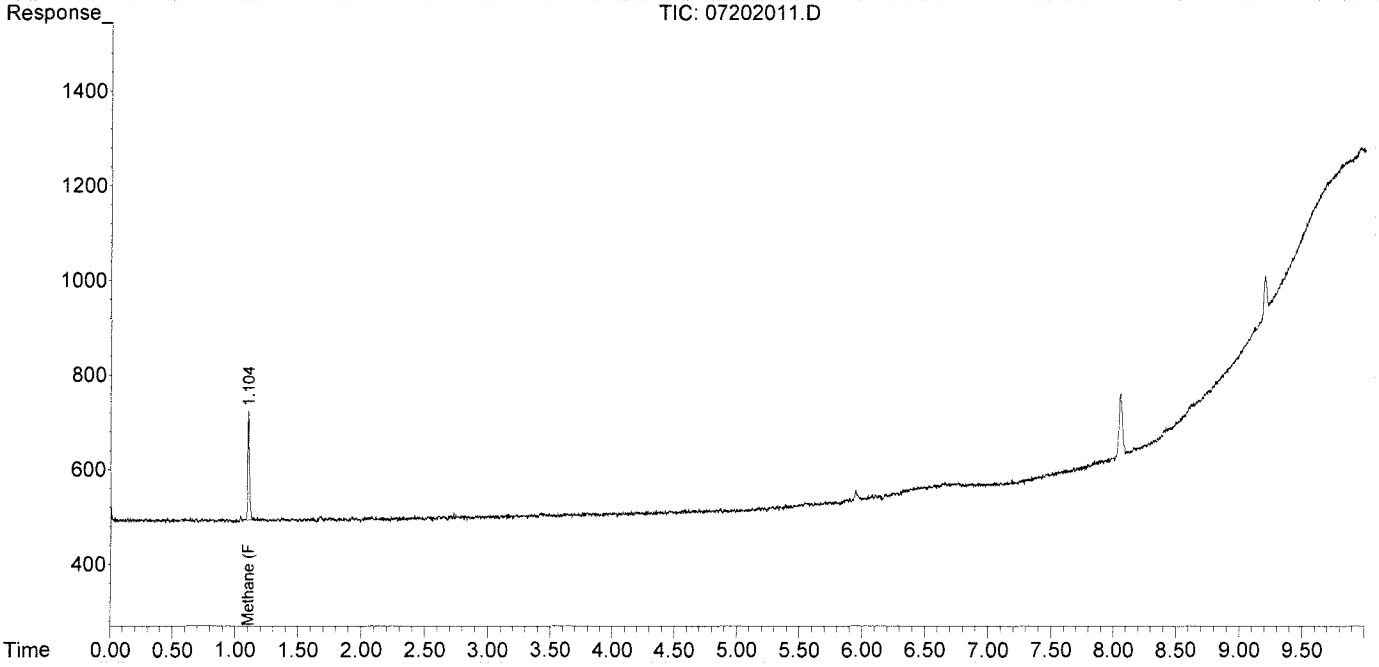
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202011.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 15:21:18
Operator : LD
Sample : P2003888-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 16:39:05 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202012.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 16:21:07
Operator : LD
Sample : P2003888-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 16:39:28 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

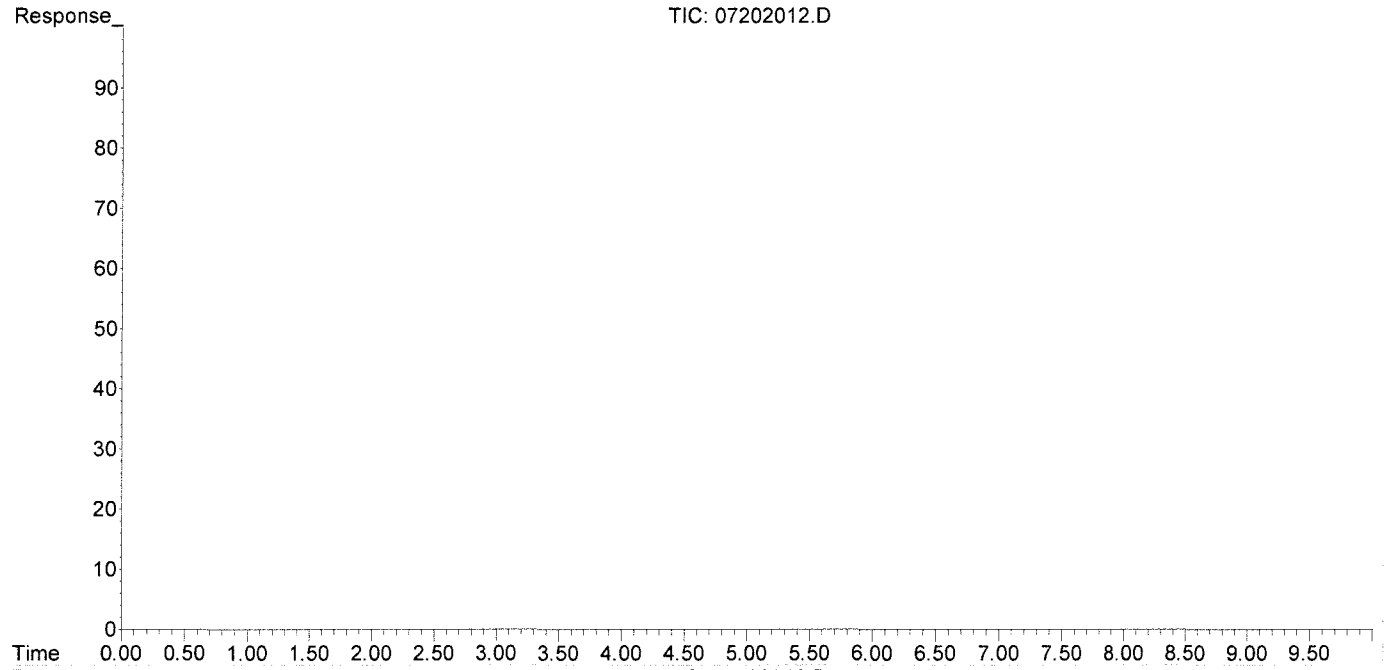
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.102	4423	0.488	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

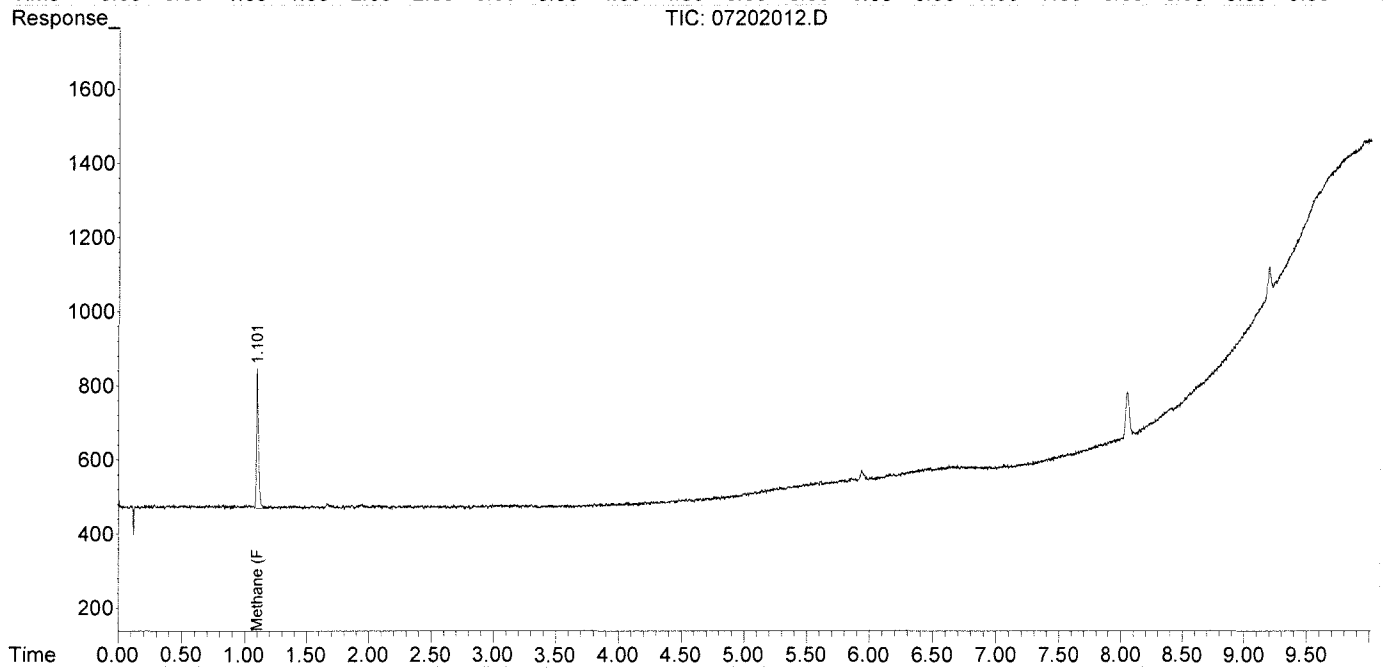
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202012.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 16:21:07
Operator : LD
Sample : P2003888-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 16:39:28 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202013.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 16:38:33
Operator : LD
Sample : P2003888-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 17:09:43 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

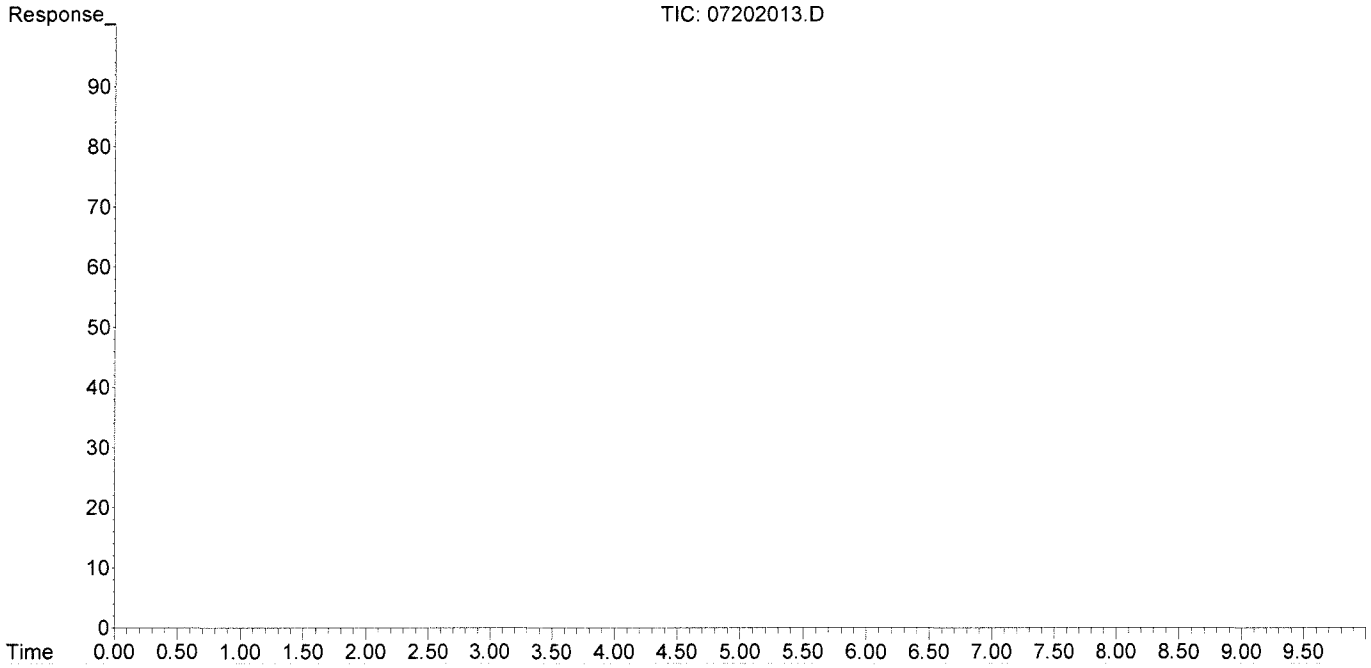
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.103	9786	1.079	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

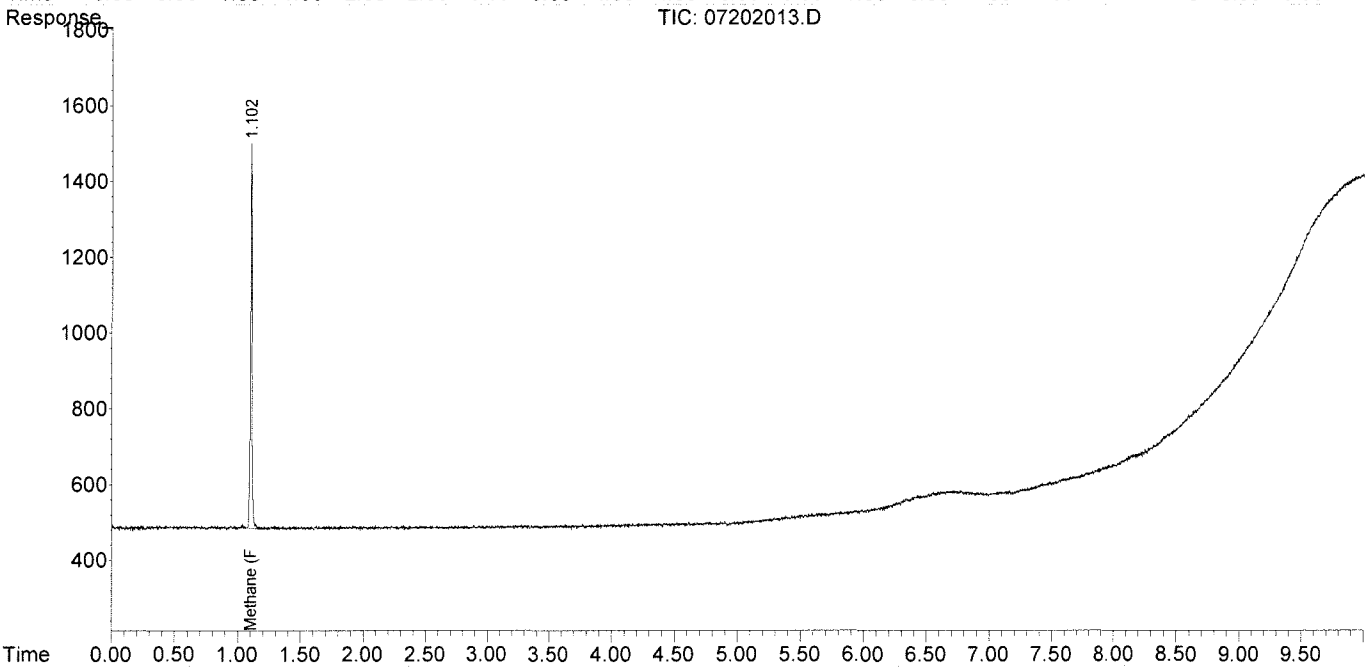
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202013.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 16:38:33
Operator : LD
Sample : P2003888-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 17:09:43 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202014.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 16:55:00
Operator : LD
Sample : P2003888-006 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 17:09:53 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

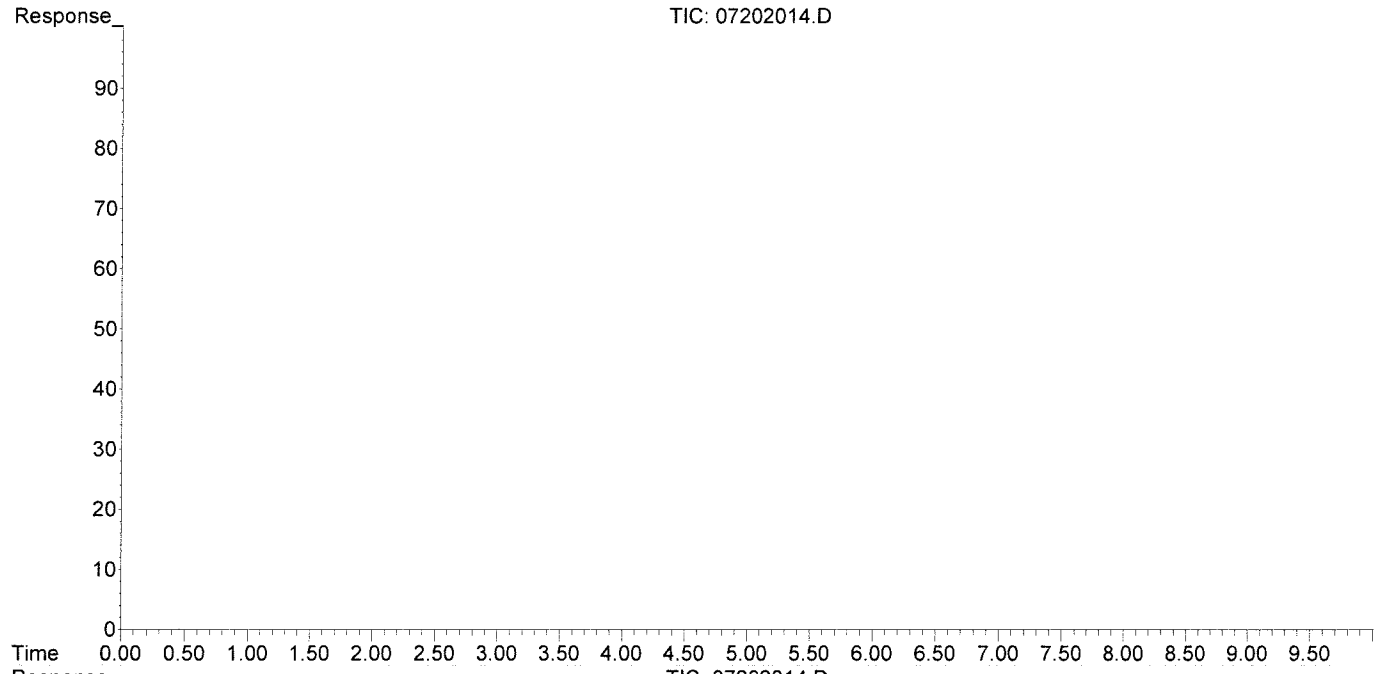
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.104	3248	0.358	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

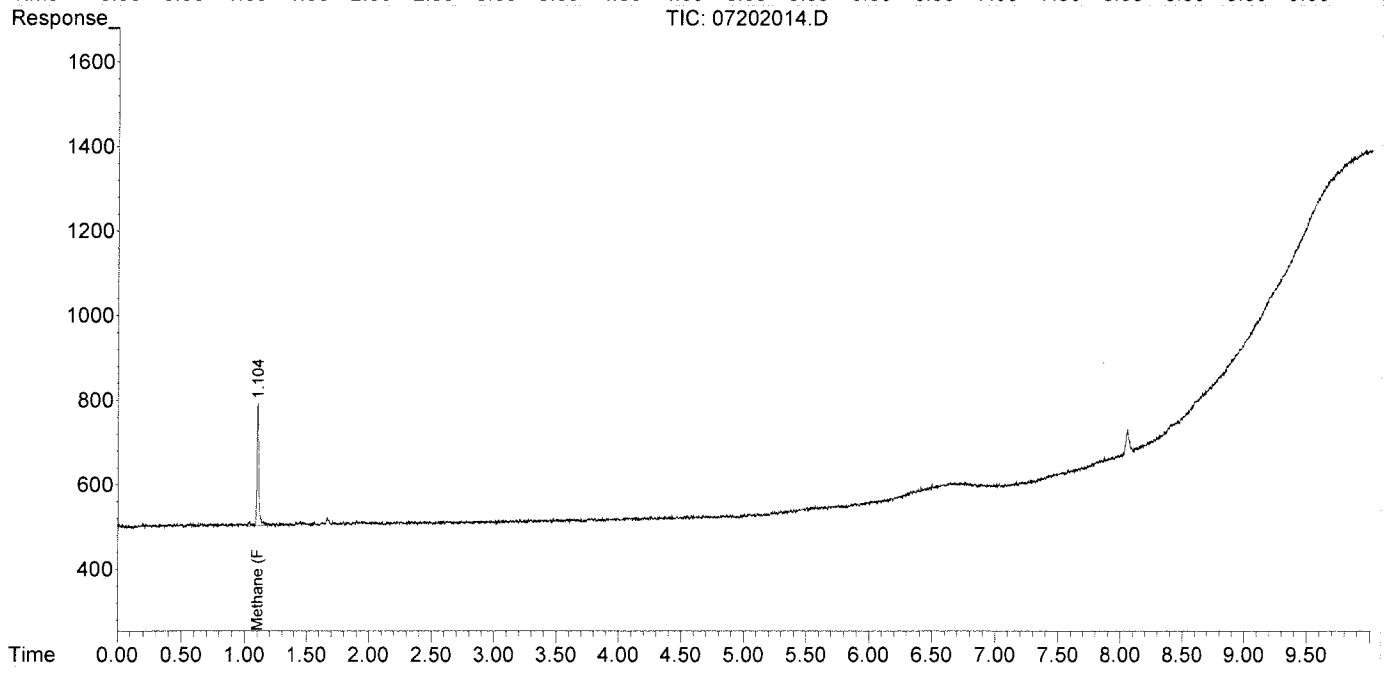
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202014.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 16:55:00
Operator : LD
Sample : P2003888-006 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 17:09:53 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202003.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 13:26:13
Operator : LD
Sample : MCS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 13:42:26 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

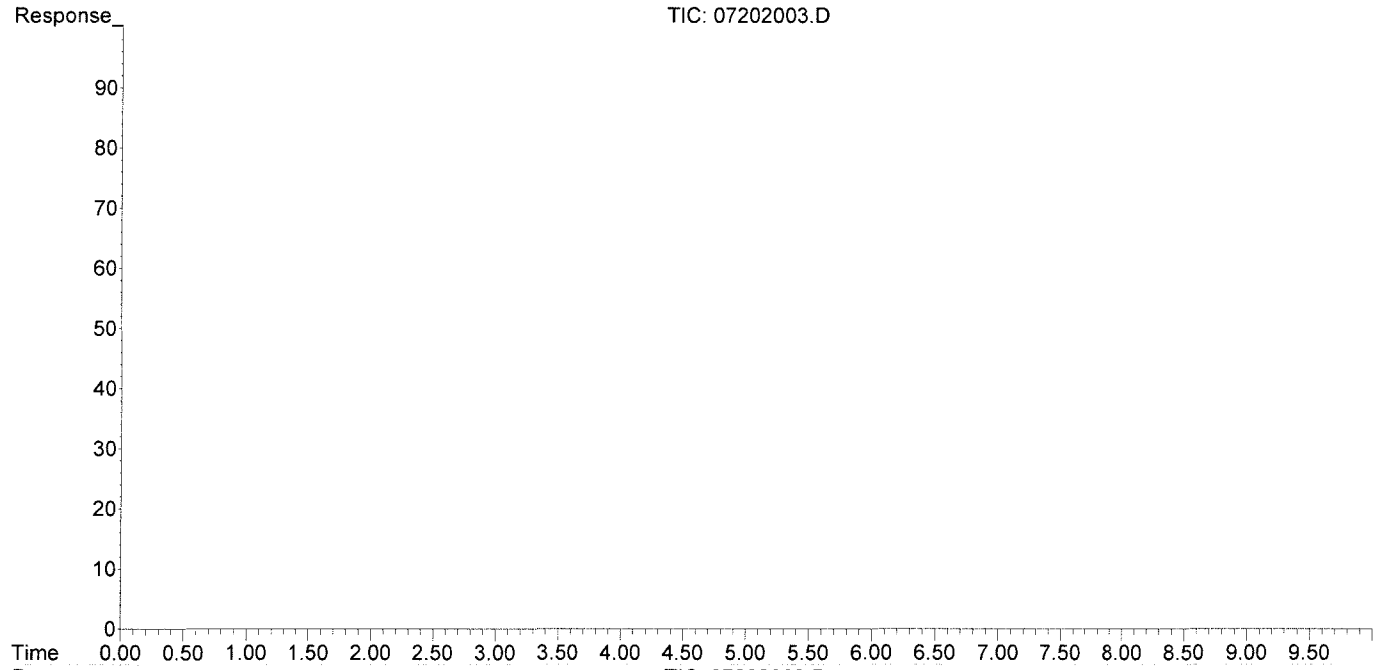
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.108	999	0.110	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

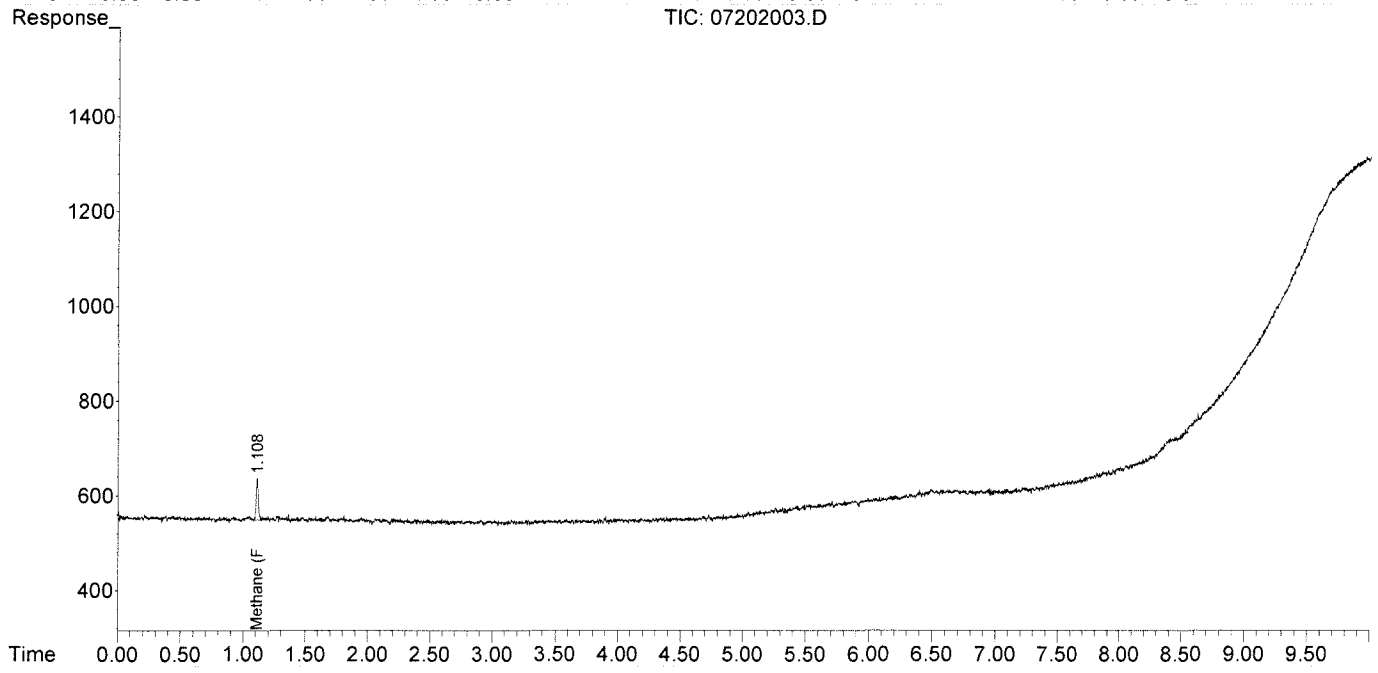
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202003.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 13:26:13
Operator : LD
Sample : MCS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 13:42:26 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202004.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 13:42:17
Operator : LD
Sample : LCS FID 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 13:57:17 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

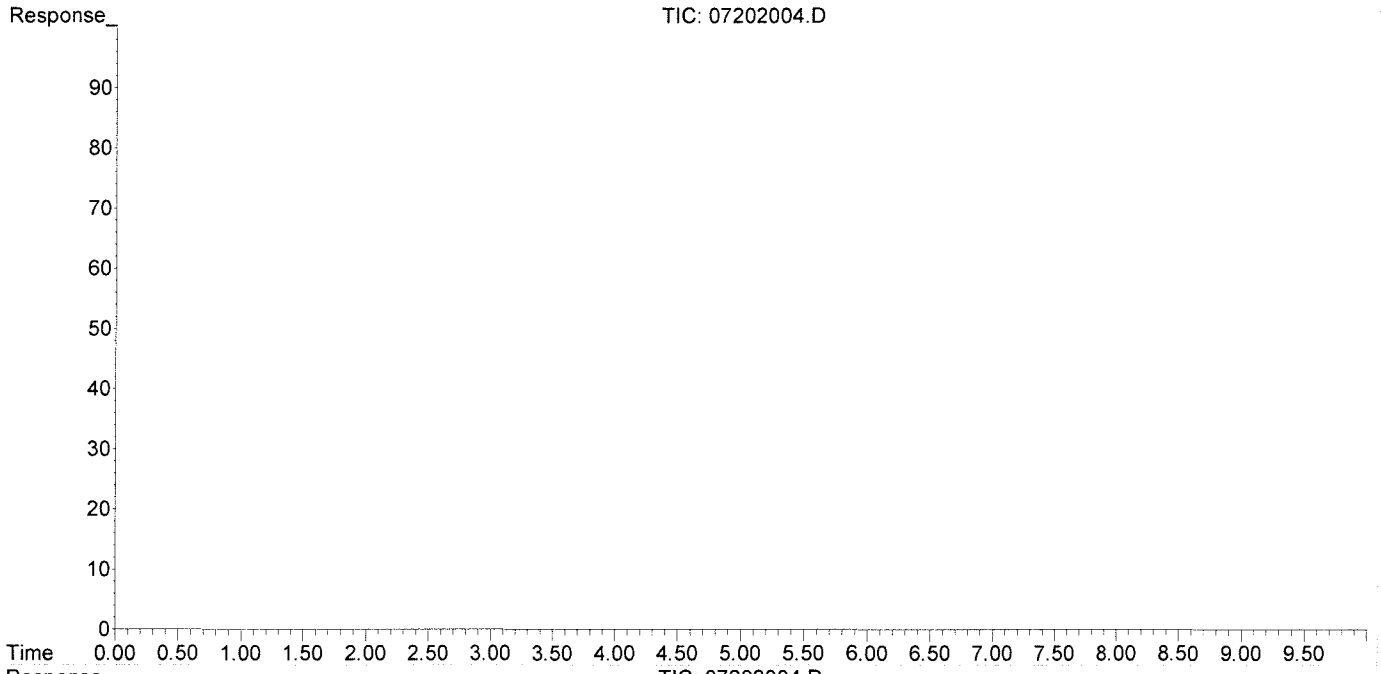
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.101	12023	1.325	ppm
7)	Ethylene	1.668	18756	1.121	ppm
8)	Ethane	1.931	20516	1.210	ppm
9)	Propylene	4.311	26413	1.127	ppm
10)	Propane	4.432	31031	1.247	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.638f	41167	1.547	ppm
13)	n-Butane	6.638f	41167	1.547	ppm

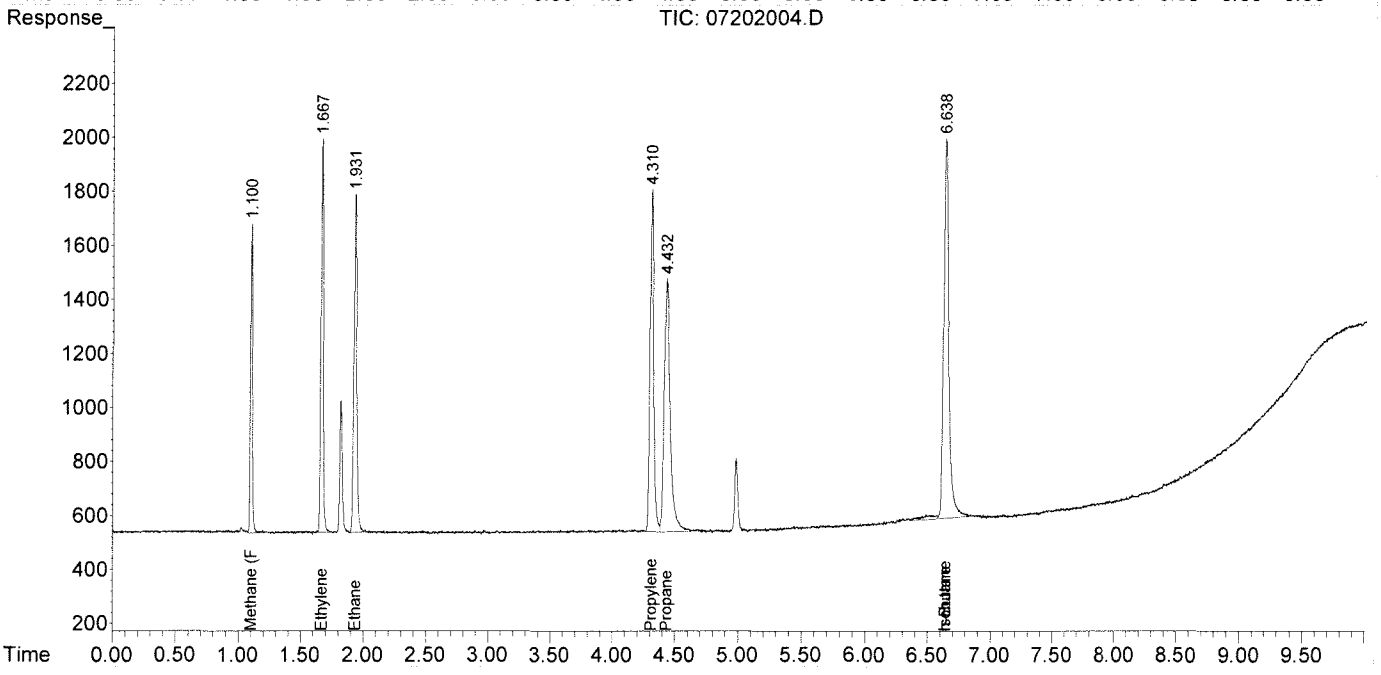
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202004.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 13:42:17
Operator : LD
Sample : LCS FID 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 13:57:17 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202005.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 13:55:32
Operator : LD
Sample : LCSD FID 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 14:05:56 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

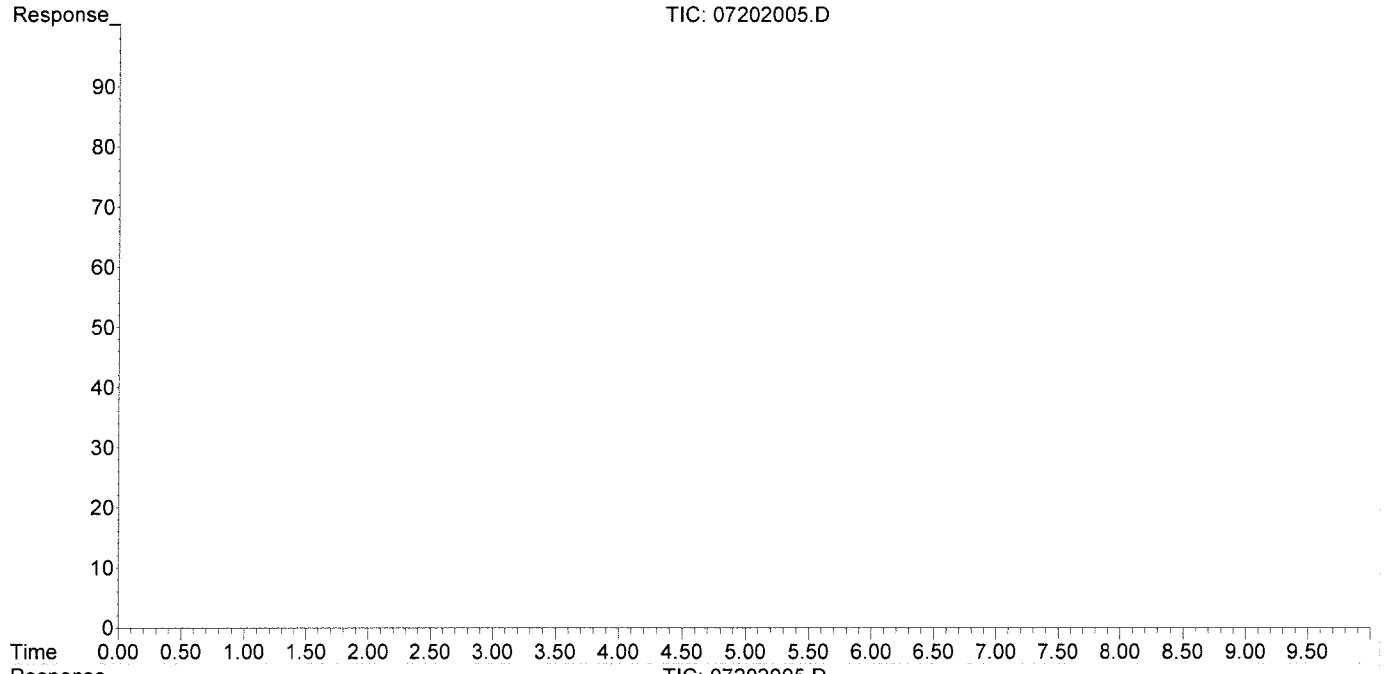
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.098	12179	1.343	ppm
7)	Ethylene	1.663	18792	1.123	ppm
8)	Ethane	1.926	20728	1.223	ppm
9)	Propylene	4.310	26129	1.115	ppm
10)	Propane	4.432	31579	1.269	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.641f	40950	1.538	ppm
13)	n-Butane	6.641f	40950	1.538	ppm

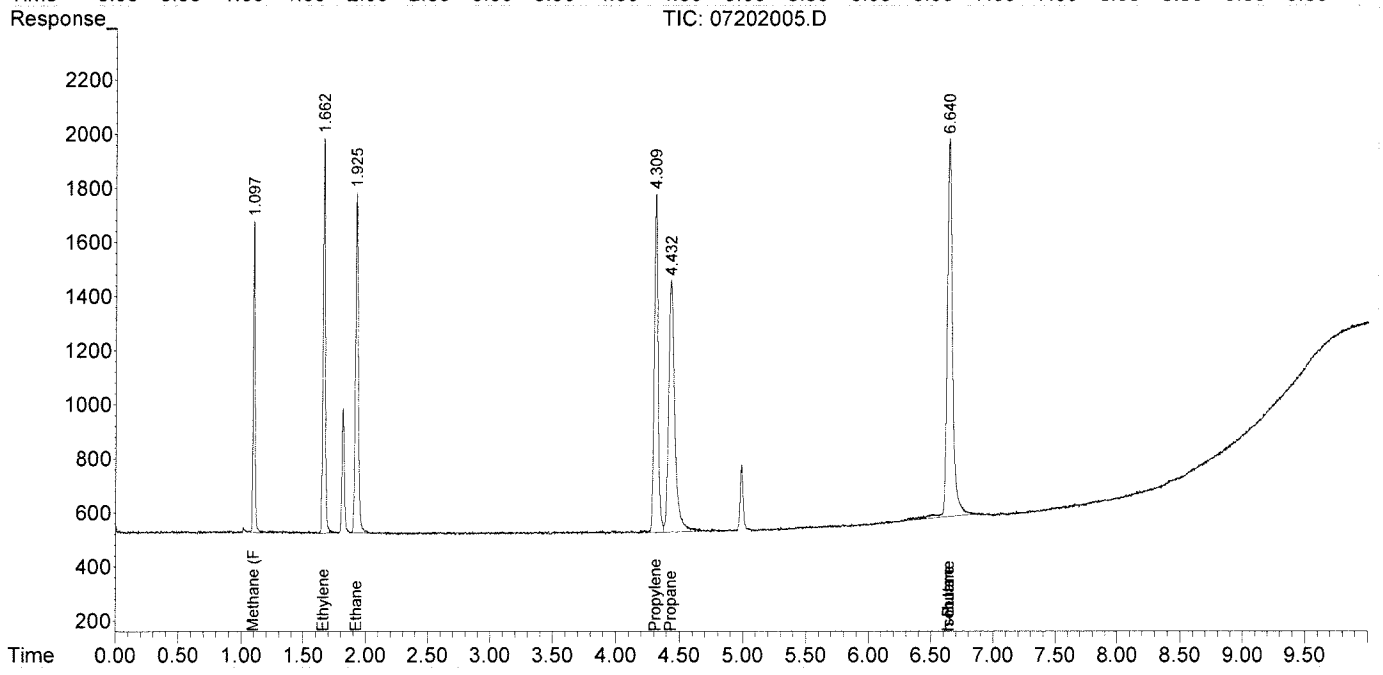
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202005.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 13:55:32
Operator : LD
Sample : LCSD FID 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 14:05:56 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Response Factor Report HP5890

Method Path : J:\GC10\METHODS\
Method File : RS091217_R.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Wed Sep 13 11:14:47 2017
Response Via : Initial Calibration

Calibration Files
1 =09121702.D 2 =09121703.D 3 =09121704.D
4 =09121705.D 5 =09121706.D 6 =09121707.D

	Compound	1	2	3	4	5	6	Avg		%RSD
1)	Oxygen/Argon	3.739		1.014			0.001	0.793	E6	189.17
2)	Carbon monoxide	3.739		1.014			0.001	0.594	E6	221.92
3)	Methane (TCD)						2.161	0.951	E2	106.37
4)	Carbon dioxide	2.365	2.569	2.558	2.361	2.459	2.314	2.438	E2	4.44

Signal #2 Calibration Files
1 =09121702.D 2 =09121703.D 3 =09121704.D
4 =09121705.D 5 =09121706.D 6 =09121707.D

	Compound	1	2	3	4	5	6	Avg		%RSD
6)	Methane (FID)		1.180	0.975	0.908	0.870	0.868	0.907	E4	11.66
7)	Ethylene	1.736	1.638	1.780	1.720	1.628	1.670	1.673	E4	3.90
8)	Ethane	1.781	1.676	1.784	1.730	1.692	1.675	1.695	E4	3.83
9)	Propylene	2.505	2.296	2.592	2.480	2.346	2.252	2.343	E4	6.56
10)	Propane	2.439	2.283	2.645	2.555	2.433	2.522	2.488	E4	4.20
11)	Isobutylene							0.652	E1	138.46
12)	Isobutane	6.058	4.793	2.214	1.553	1.353		2.662	E4	86.17
13)	n-Butane	6.058	4.793	2.214	1.553	1.353		2.662	E4	86.17

(#) = Out of Range ### Number of calibration levels exceeded format ###

RS091217_R.M Wed Sep 13 15:11:48 2017

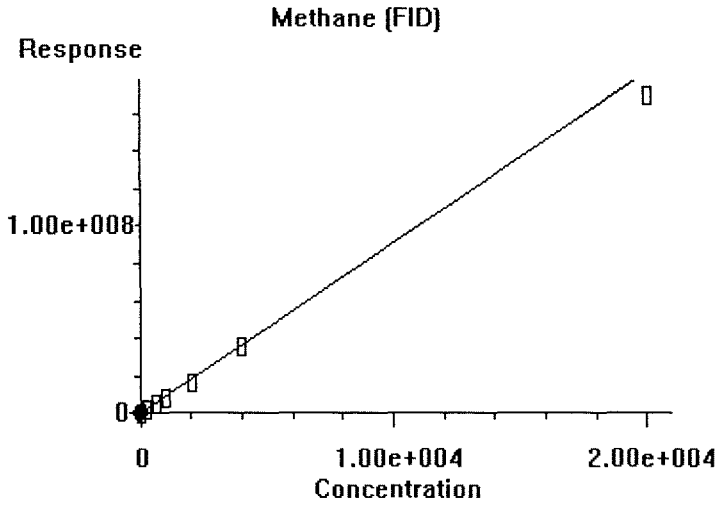
Edit Compounds -- Compound #6 -- Methane (FID)

Search by: Ret Time Name Index Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	
2	0.302000	3564.400000
3	1.510000	14725.268625
4	4.530000	41128.575000
5	10.570000	91966.784531
6	200.000000	1735997.497500
7	600.000000	5189848.900000
8	1000.000000	8598533.570000
9	2000.000000	16098209.390000
10	4000.000000	35776839.311362
11	20000.000000	169009160.49199



0.000e+000	Quadratic term
9.071e+003	Linear term
0.000e+000	Constant term
11.657%	RF Rel Std Dev

OK Cancel Help Print Calibration Curve Copy Calibration Curve

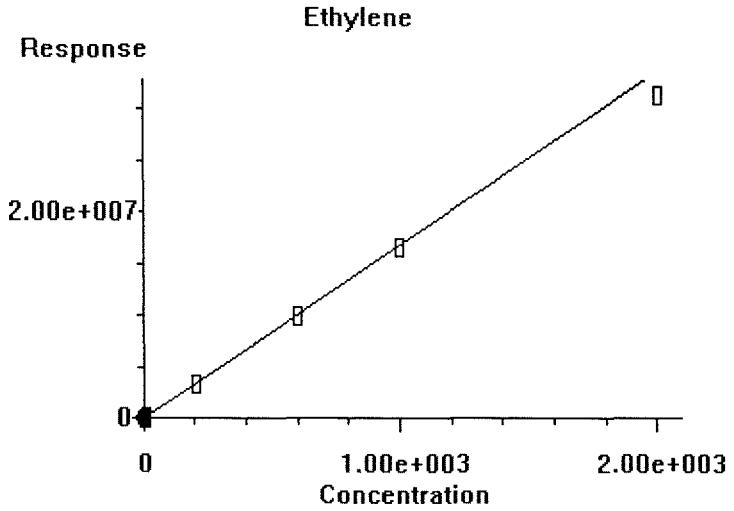
Edit Compounds -- Compound #7 -- Ethylene

Search by: Ret Time | Name | Index | Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response	Lvl ID	Concentration	Response
1	0.151000	2621.970000	11	20000.000000	
2	0.302000	4946.731301			
3	1.510000	26884.746847			
4	4.530000	77902.721497			
5	10.570000	172085.529560			
6	200.000000	3339702.313219			
7	600.000000	10007758.776971			
8	1000.000000	16608503.805988			
9	2000.000000	31192443.898600			
10	4000.000000				



0.000e+000	Quadratic term
1.673e+004	Linear term
0.000e+000	Constant term
3.897%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Edit Compounds -- Compound #8 -- Ethane

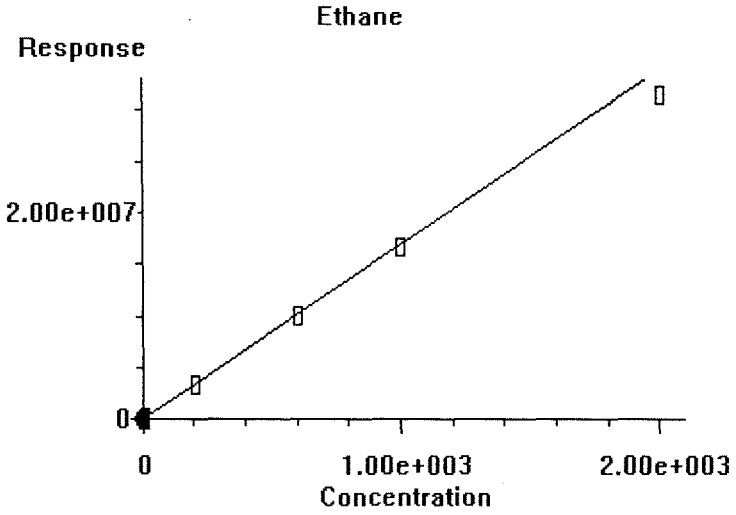
Search by: Ret Time | Name | Index | Find Compound

- Compound Database
  - External Standard Compoun
    - Oxygen/Argon
    - Carbon monoxide
    - Methane (TCD)
    - Carbon dioxide
    - Signal #2
    - Methane (FID)
    - Ethylene
    - Ethane
    - Propylene
    - Propane
    - Isobutylene
    - Isobutane
    - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	2689.928008
2	0.302000	5060.331943
3	1.510000	26943.667500
4	4.530000	78353.525045
5	10.570000	178840.731148
6	200.000000	3350442.319129
7	600.000000	10048964.218029
8	1000.000000	16709164.879012
9	2000.000000	31424217.938900
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
1.695e+004	Linear term
0.000e+000	Constant term
3.831%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Edit Compounds -- Compound #9 -- Propylene

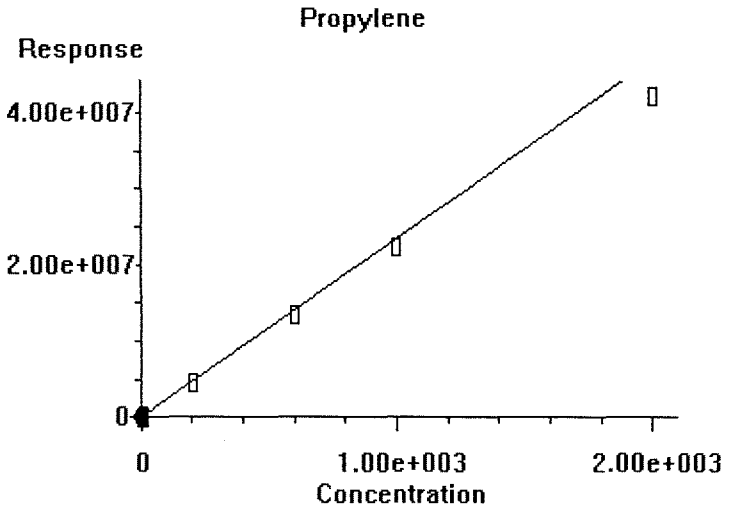
Search by: Ret Time | Name | Index | Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	3782.537646
2	0.302000	6933.285530
3	1.510000	39139.518208
4	4.530000	112341.896872
5	10.570000	248003.903623
6	200.000000	4504060.086084
7	600.000000	13569342.761419
8	1000.000000	22494887.720990
9	2000.000000	42124689.656800
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
2.343e+004	Linear term
0.000e+000	Constant term
6.559%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Edit Compounds -- Compound #10 -- Propane

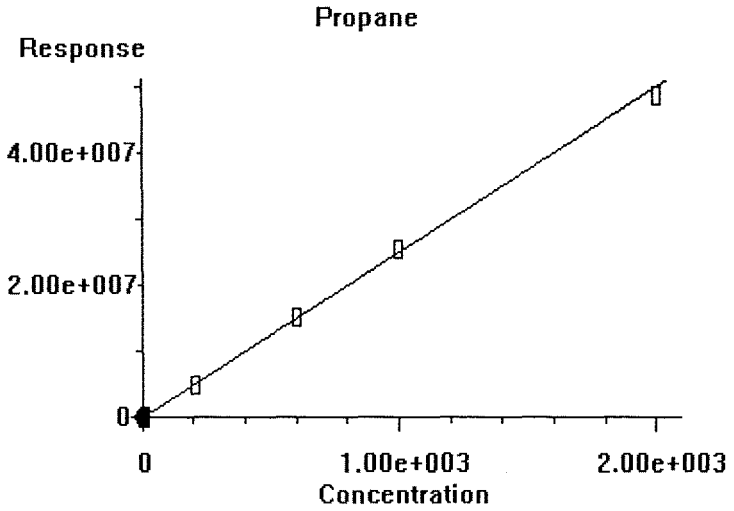
Search by: (•) Ret Time ( ) Name ( ) Index [ ] Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	3682.897354
2	0.302000	6894.237803
3	1.510000	39934.166792
4	4.530000	115723.428128
5	10.570000	257124.432806
6	200.000000	5043035.663916
7	600.000000	15251325.797404
8	1000.000000	25459410.657938
9	2000.000000	48583085.287451
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
2.488e+004	Linear term
0.000e+000	Constant term
4.200%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Calibration Status Report HP5890

Method Path : J:\GC10\METHODS\
Method File : RS091217_R.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Wed Sep 13 11:14:47 2017
Response Via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	1	0	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121702.D
2	2	0	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121703.D
3	3	3	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121704.D
4	4	10	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121705.D
5	5	25	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121706.D
6	6	125	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121707.D
7	7	5000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121708.D
8	8	25000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121709.D
9	9	2000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121710.D
10	10	30000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121711.D
11	11	20000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121712.D

#	ID	Update Time	Quant Time	Acquisition Time
1	1	Sep 13 11:04 2017	Sep 12 15:03 2017	12-Sep-2017, 10:52
2	2	Sep 13 11:05 2017	Sep 13 11:05 2017	12-Sep-2017, 11:05
3	3	Sep 13 11:06 2017	Sep 13 11:05 2017	12-Sep-2017, 11:45
4	4	Sep 13 11:09 2017	Sep 13 11:06 2017	12-Sep-2017, 12:09
5	5	Sep 13 11:09 2017	Sep 13 11:09 2017	12-Sep-2017, 12:30
6	6	Sep 13 11:10 2017	Sep 13 11:10 2017	12-Sep-2017, 12:47
7	7	Sep 13 11:11 2017	Sep 13 11:10 2017	12-Sep-2017, 13:00
8	8	Sep 13 11:12 2017	Sep 13 11:11 2017	12-Sep-2017, 13:47
9	9	Sep 13 11:12 2017	Sep 13 11:12 2017	12-Sep-2017, 14:07
10	10	Sep 13 11:14 2017	Sep 13 11:13 2017	12-Sep-2017, 14:48
11	11	Sep 13 11:14 2017	Sep 13 11:14 2017	12-Sep-2017, 15:21

RS091217_R.M Wed Sep 13 15:11:22 2017

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121702.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 10:52
Operator : MC
Sample : 0.151ppm 0.250ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 12 11:03:15 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.767	373920	0.128	ppm	
2)	Carbon monoxide	1.767	373920	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	1.595	2622	0.156	ppm	
8)	Ethane	1.848	2690	0.156	ppm	
9)	Propylene	4.222	3783	0.154	ppm	
10)	Propane	4.348	3683	0.139	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.582f	6058	NoCal	ppm	
13)	n-Butane	6.582f	6058	NoCal	ppm	

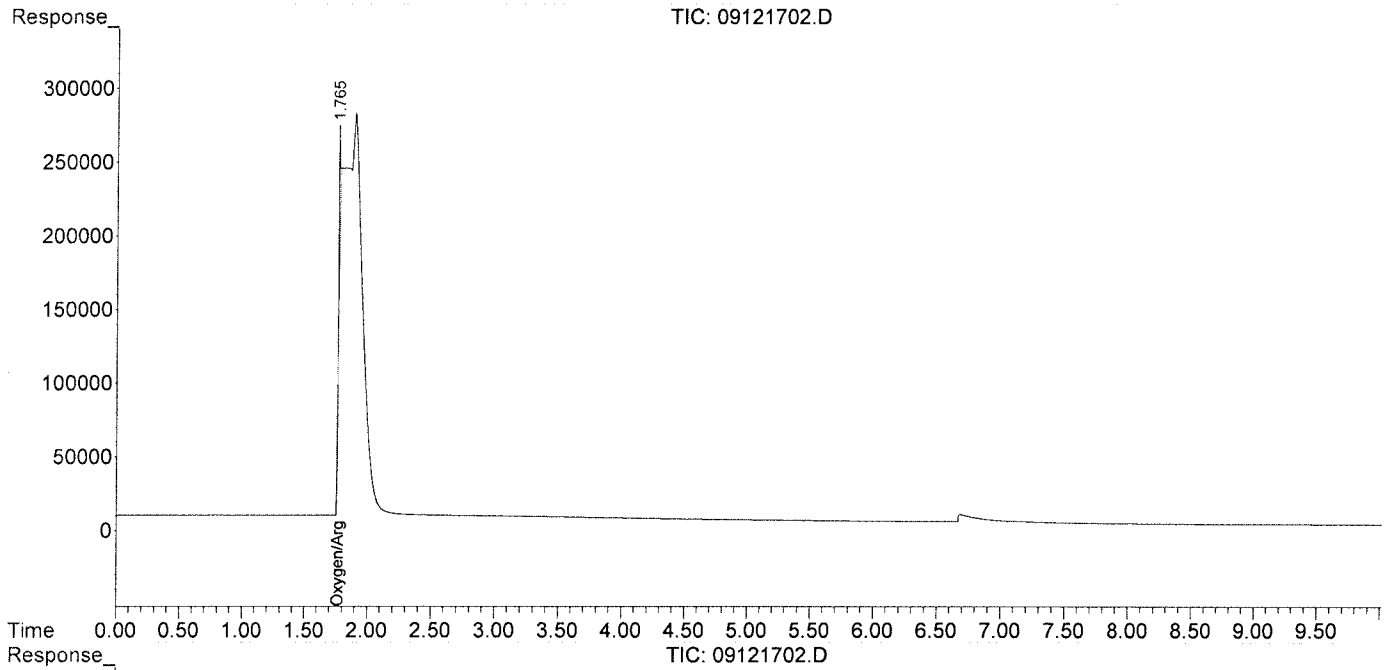
(f)=RT Delta > 1/2 Window (m)=manual int.

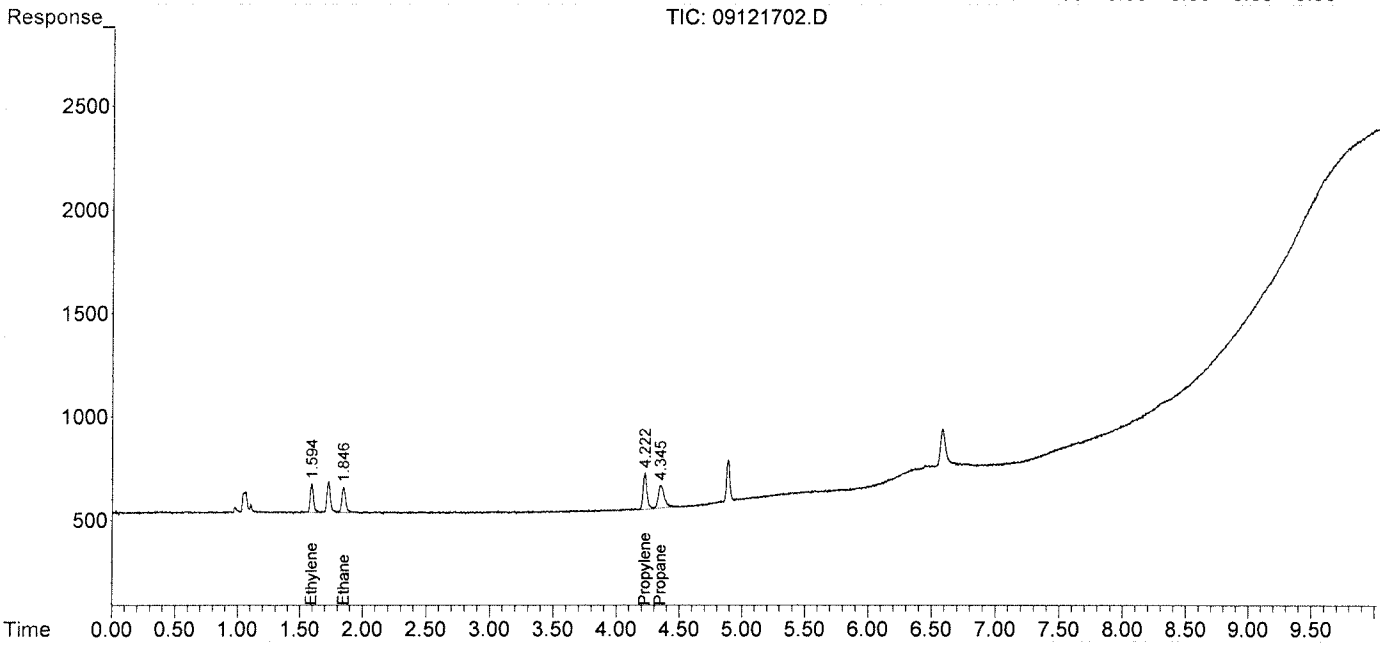
9/13/17

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121702.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 10:52
Operator : MC
Sample : 0.151ppm 0.250ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 12 11:03:15 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

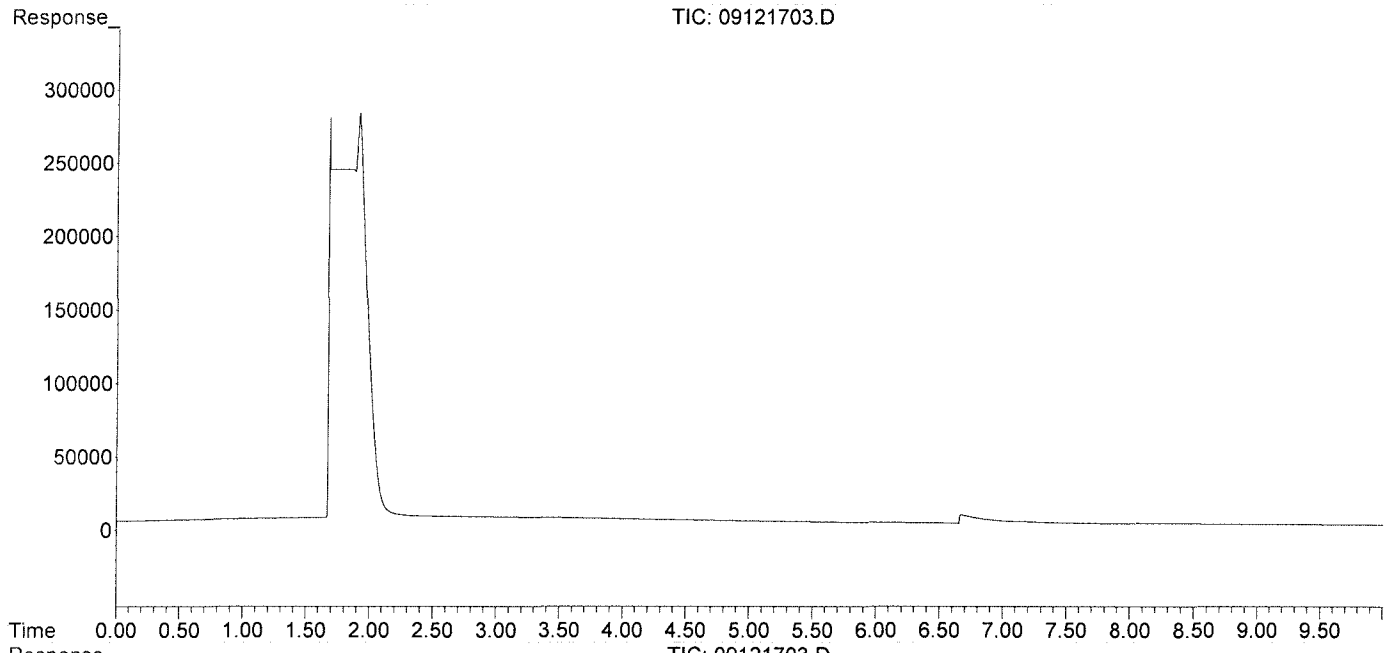
	Compound	R.T.	Response	Conc	Units	
Target	Compounds					
1)	Oxygen/Argon	1.913f	-25181981	N.D.	ppm	
2)	Carbon monoxide	1.913f	-25181981	1.089	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.049	3564	0.391	ppm	m
7)	Ethylene	1.577	4947	0.292	ppm	
8)	Ethane	1.828	5060	0.293	ppm	
9)	Propylene	4.207	6933	0.281	ppm	
10)	Propane	4.337	6894	0.268	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.579f	9587	0.158	ppm	
13)	n-Butane	6.579f	9587	0.158	ppm	

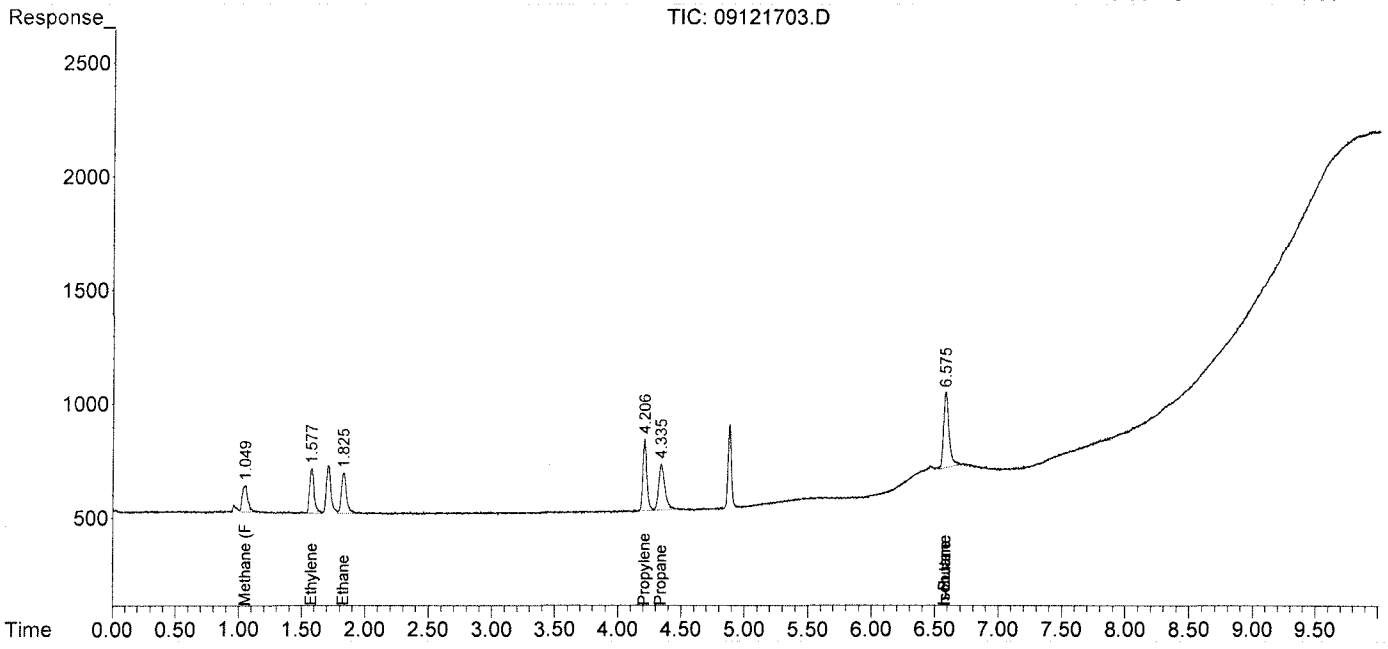
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

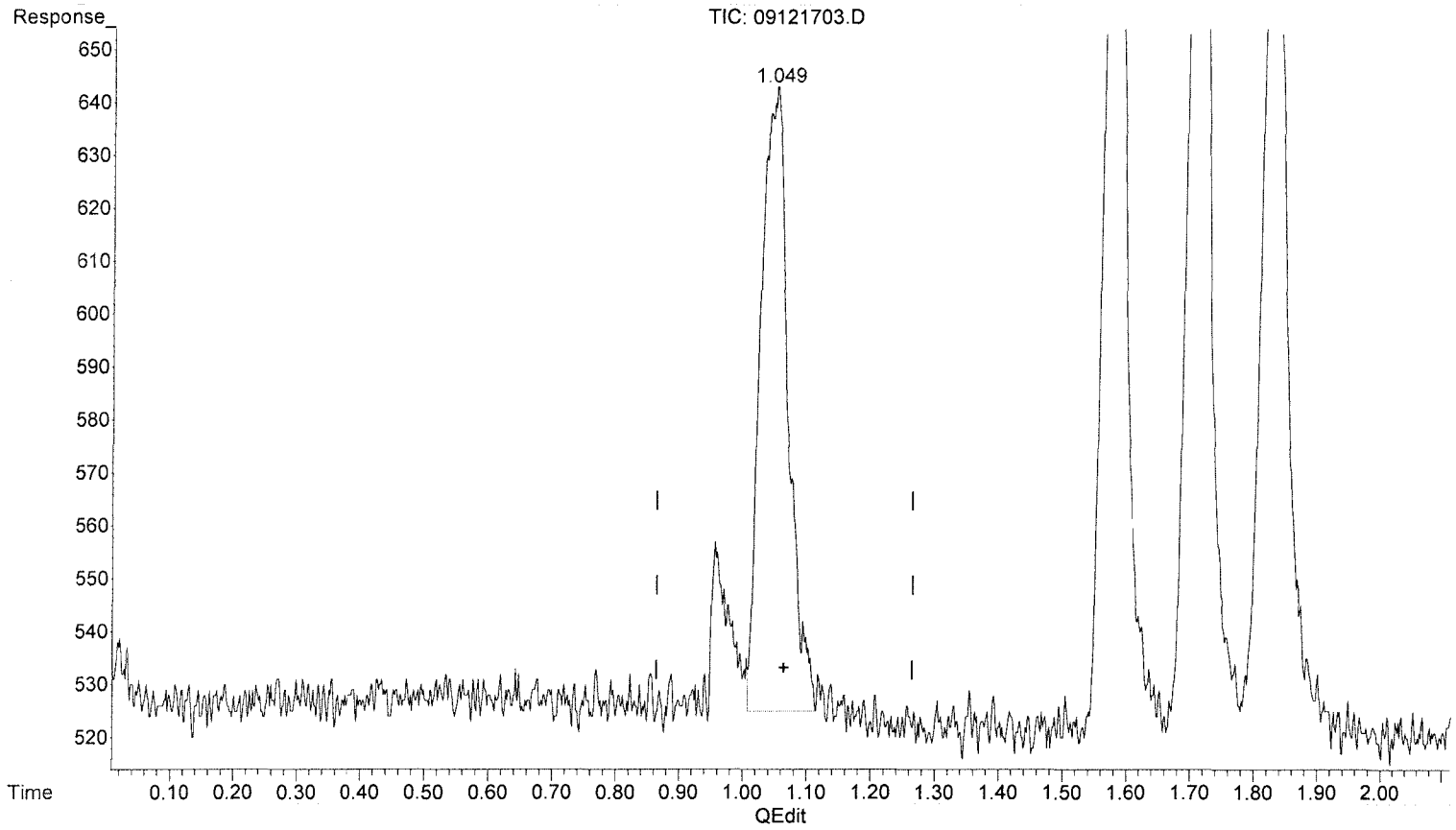




Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)

1.049min 0.391 ppm m

response 3564

(+) = Expected Retention Time

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121704.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:45
Operator : MC
Sample : 1.51ppm 0.1ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:55 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

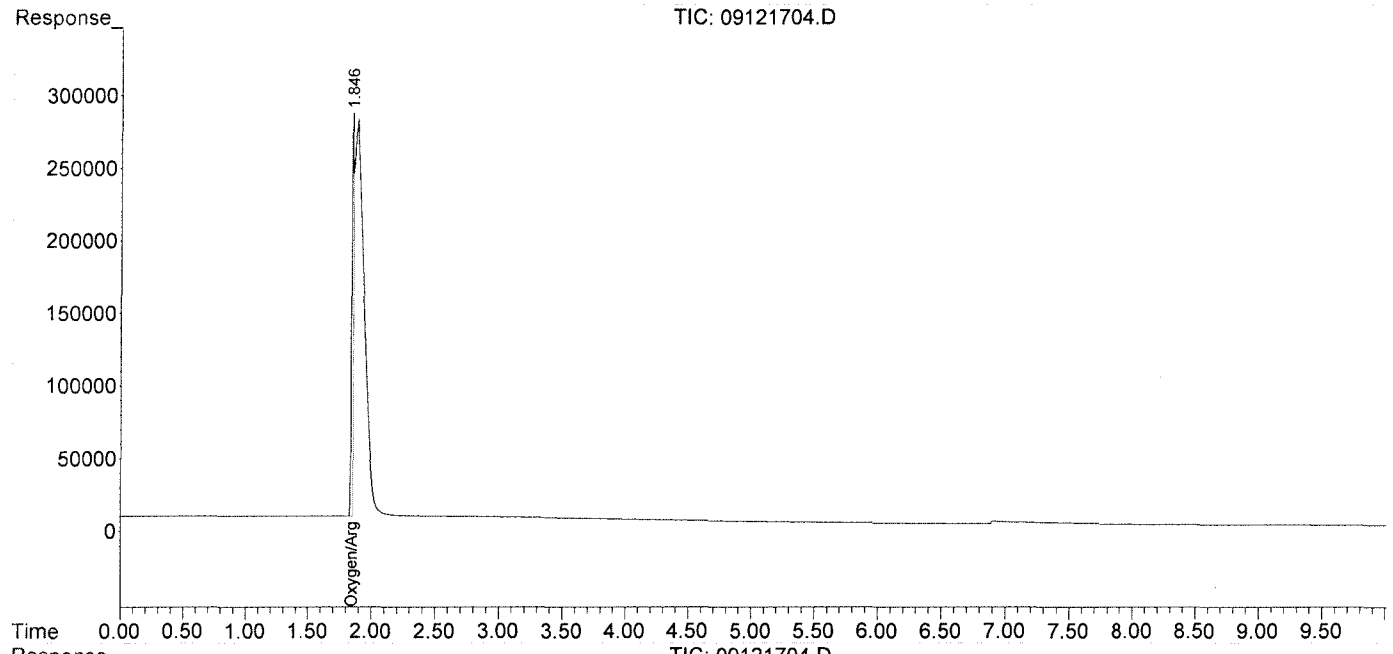
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.847	2536230	1.056	ppm
2)	Carbon monoxide	1.847	2536230	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.064	14725	1.613	ppm
7)	Ethylene	1.598	26885	1.582	ppm
8)	Ethane	1.851	26944	1.555	ppm
9)	Propylene	4.220	39140	1.589	ppm
10)	Propane	4.349	39934	1.596	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.578f	55348	1.020	ppm
13)	n-Butane	6.578f	55348	1.020	ppm

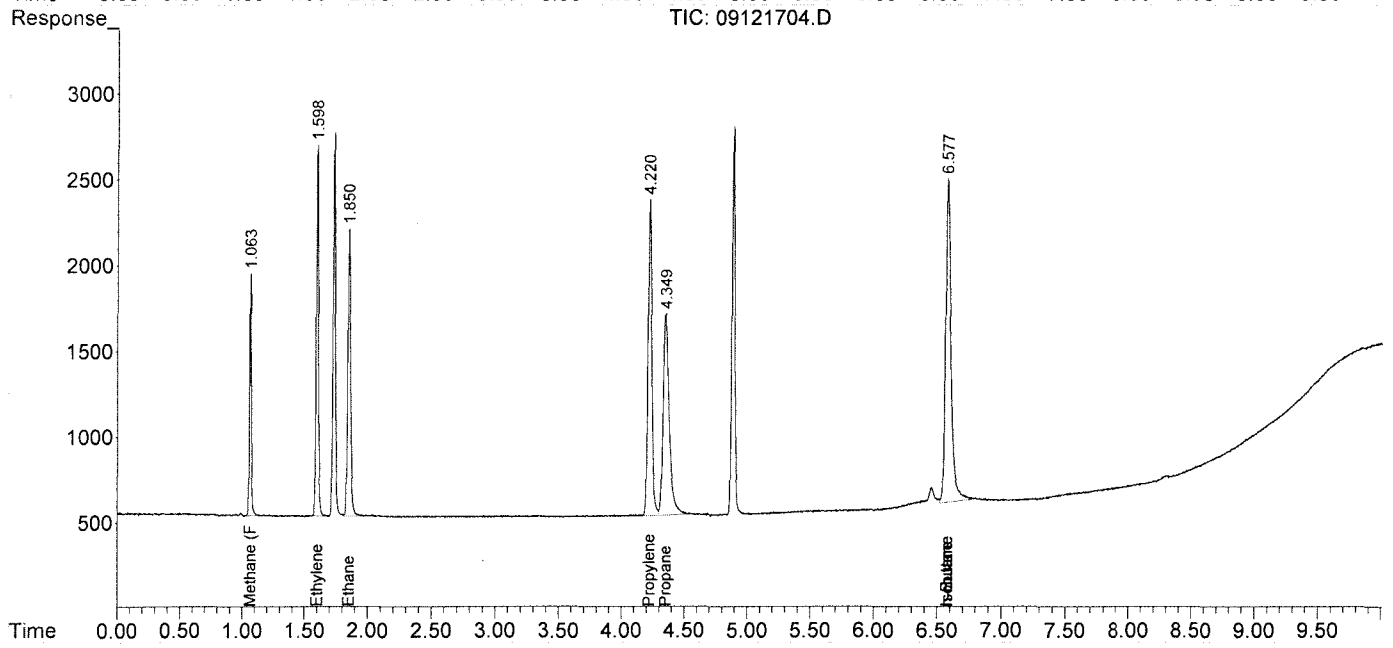
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121704.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:45
Operator : MC
Sample : 1.51ppm 0.1ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:55 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121705.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:09
Operator : MC
Sample : 4.53ppm 0.3ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:06:32 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

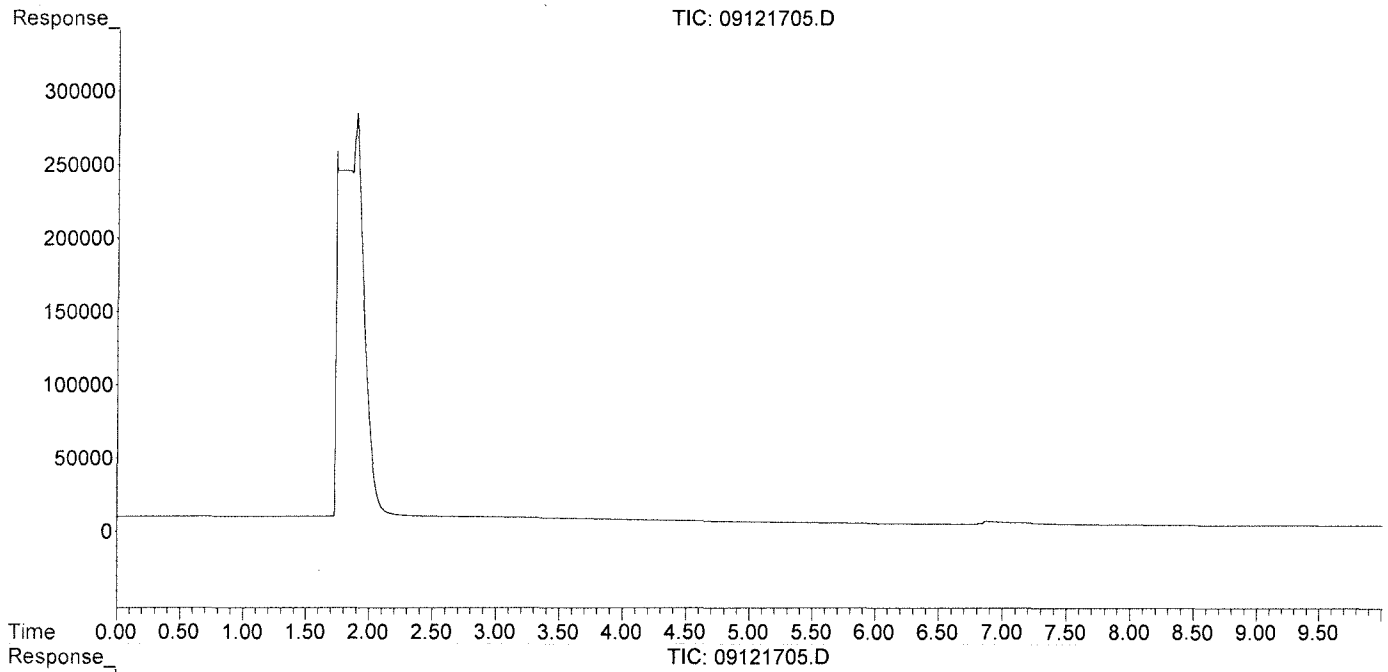
	Compound	R.T.	Response	Conc	Units
Target	Compounds				
1)	Oxygen/Argon	1.738	-331216	N.D.	ppm
2)	Carbon monoxide	1.738	-331216	0.019	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.052	41129	4.522	ppm
7)	Ethylene	1.586	77903	4.637	ppm
8)	Ethane	1.838	78354	4.558	ppm
9)	Propylene	4.218	112342	4.614	ppm
10)	Propane	4.347	115723	4.680	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.580f	155256	3.565	ppm
13)	n-Butane	6.580f	155256	3.565	ppm

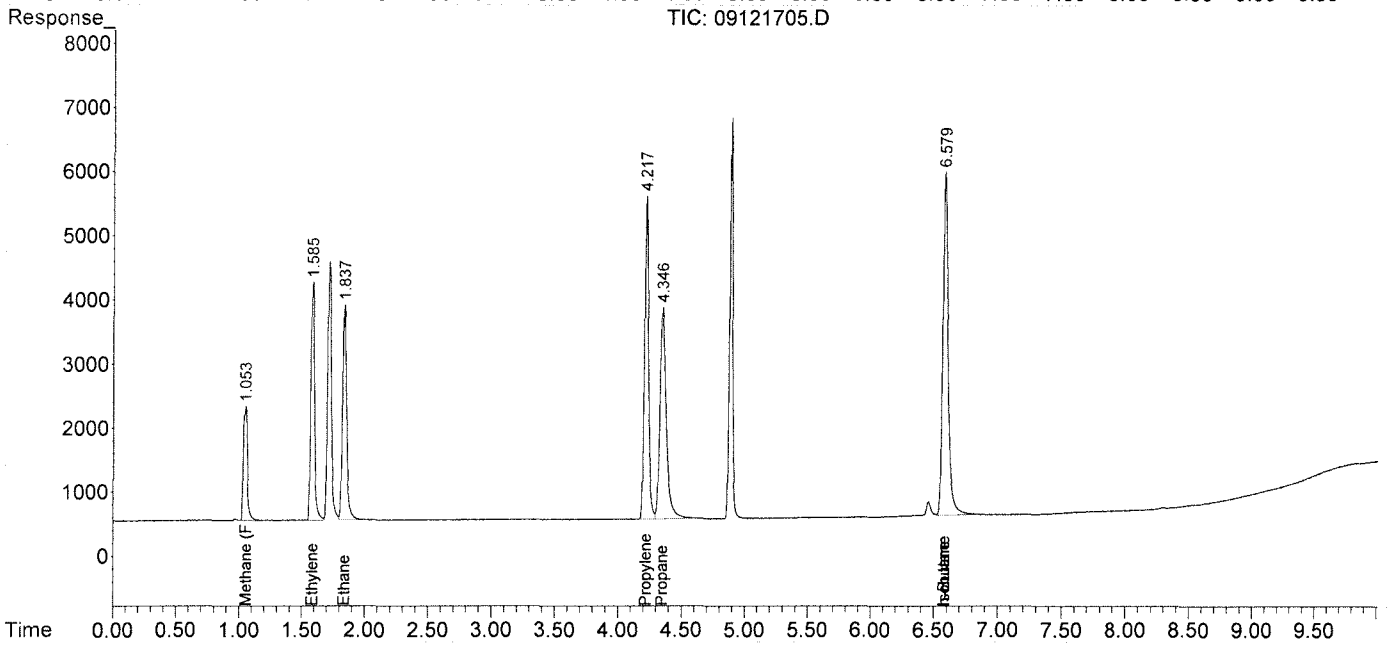
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121705.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:09
Operator : MC
Sample : 4.53ppm 0.3ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:06:32 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121706.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:30
Operator : MC
Sample : 10.57ppm 0.7ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:24 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

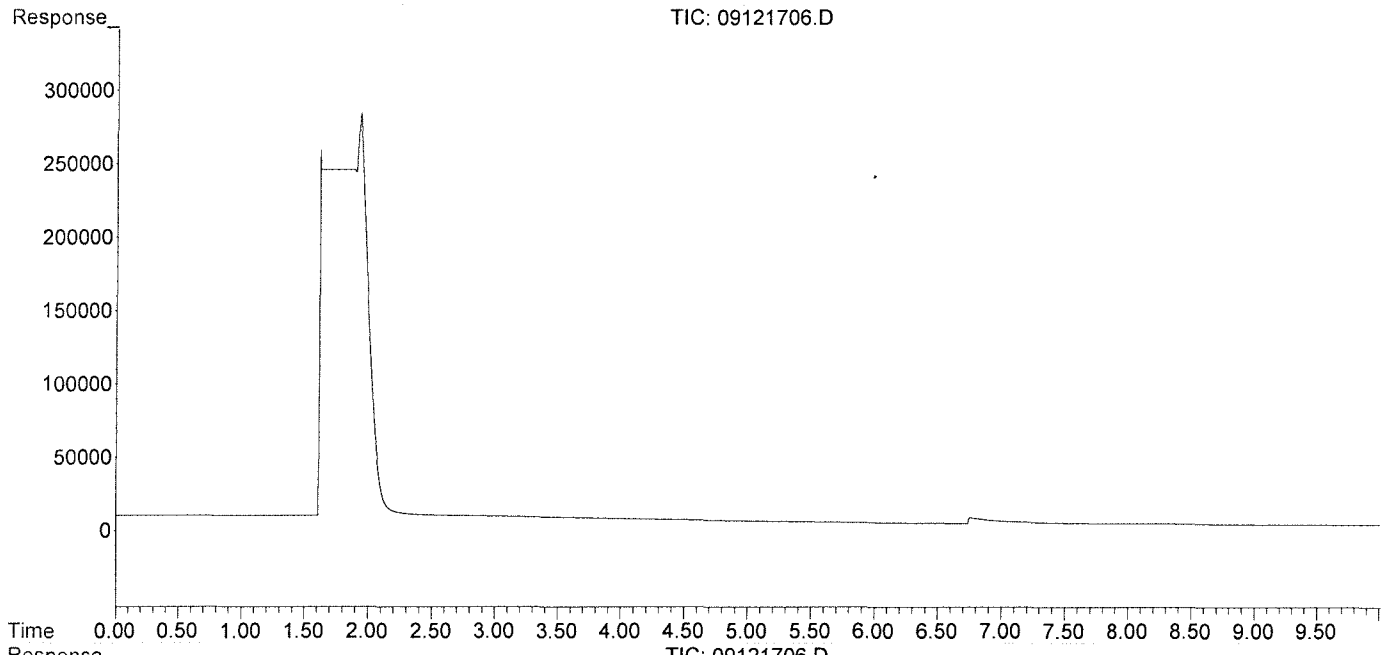
	Compound	R.T.	Response	Conc	Units
Target	Compounds				
1)	Oxygen/Argon	1.929f	-31871242	N.D.	ppm
2)	Carbon monoxide	1.929f	-31871242	1.818	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.025	91967	10.135	ppm
7)	Ethylene	1.568	172086	10.273	ppm
8)	Ethane	1.822	178841	10.441	ppm
9)	Propylene	4.214	248004	10.236	ppm
10)	Propane	4.344	257124	10.458	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.578f	338181	9.254	ppm
13)	n-Butane	6.578f	338181	9.254	ppm

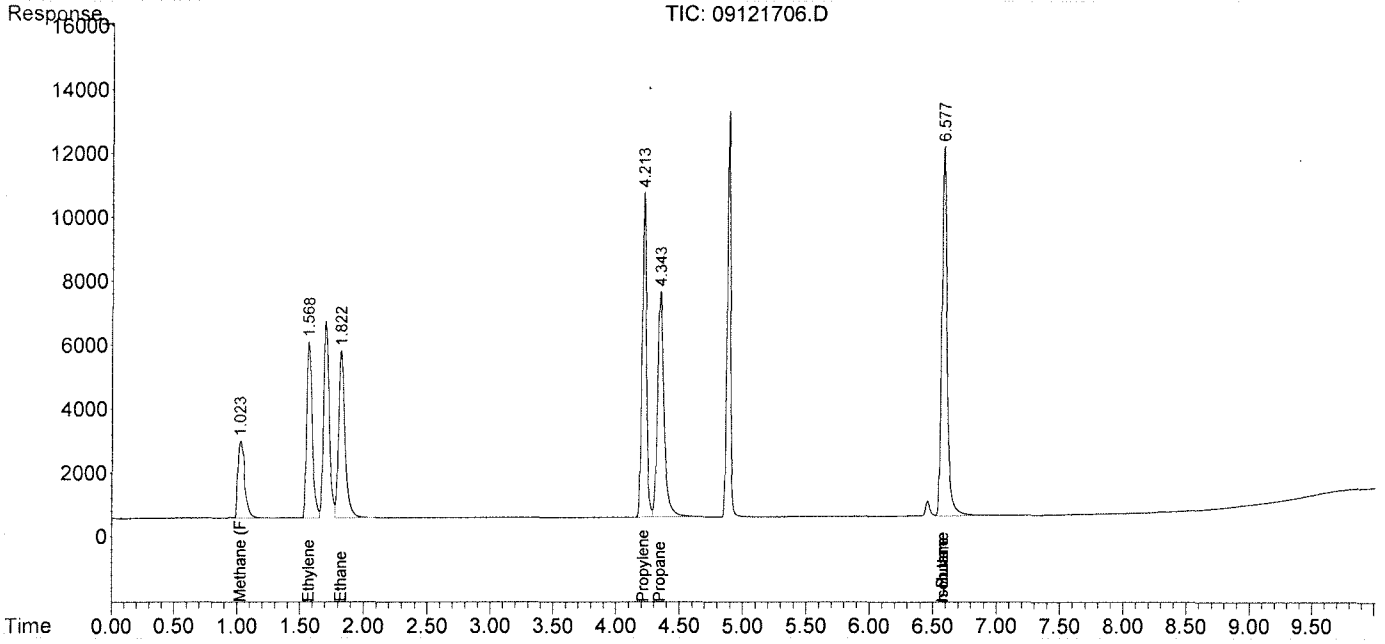
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121706.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:30
Operator : MC
Sample : 10.57ppm 0.7ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:24 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121707.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:47
Operator : MC
Sample : 200ppm 0.1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:59 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

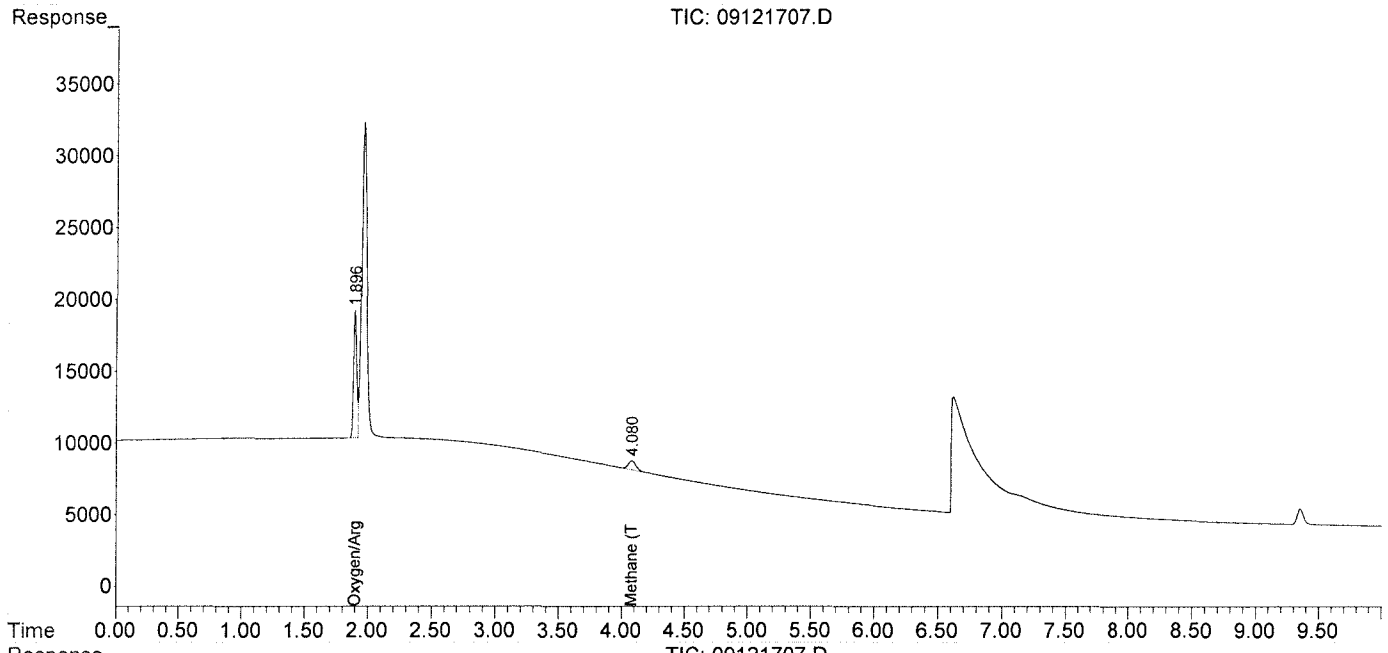
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.897	155286	0.065	ppm
2)	Carbon monoxide	1.897	155286	N.D.	ppm
3)	Methane (TCD)	4.079f	27015	2856.472	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.063	1735997	190.792	ppm
7)	Ethylene	1.597	3339702	198.758	ppm
8)	Ethane	1.849	3350442	194.597	ppm
9)	Propylene	4.201	4504060	185.706	ppm
10)	Propane	4.333	5043036	204.809	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

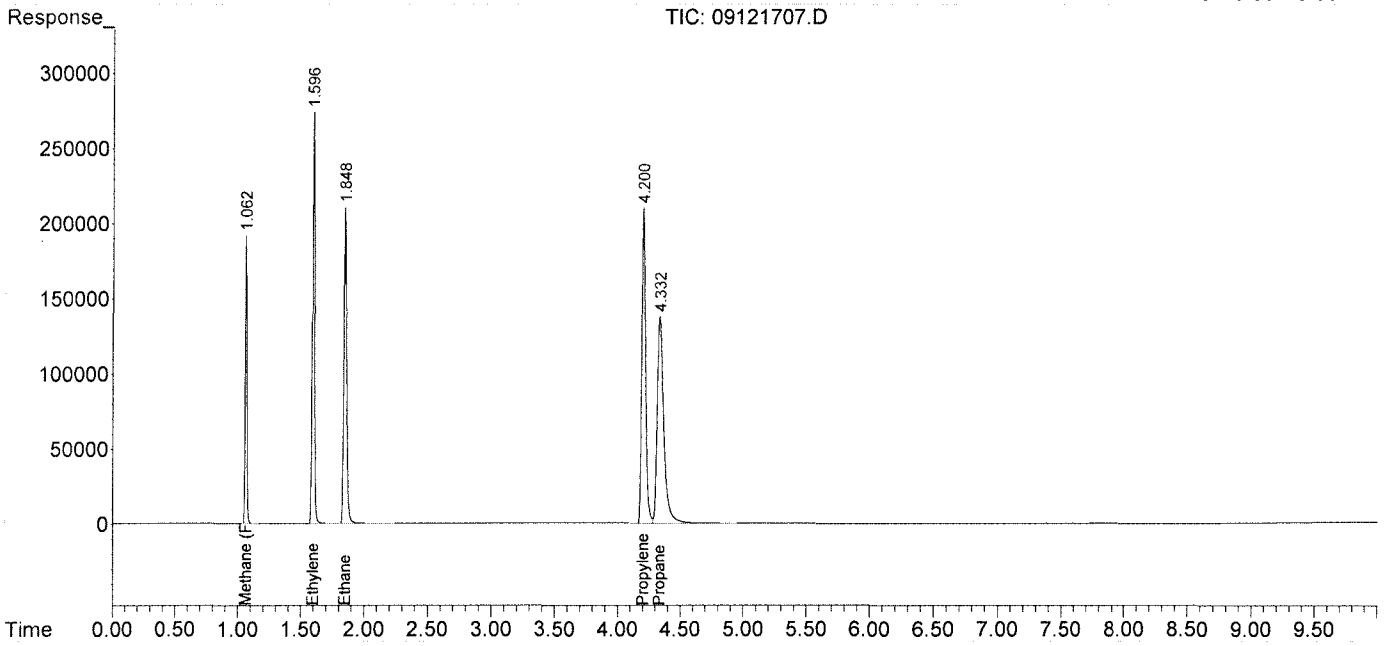
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121707.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:47
Operator : MC
Sample : 200ppm 0.1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:59 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121708.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:00
Operator : MC
Sample : 600ppm 0.3ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:10:57 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:10:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

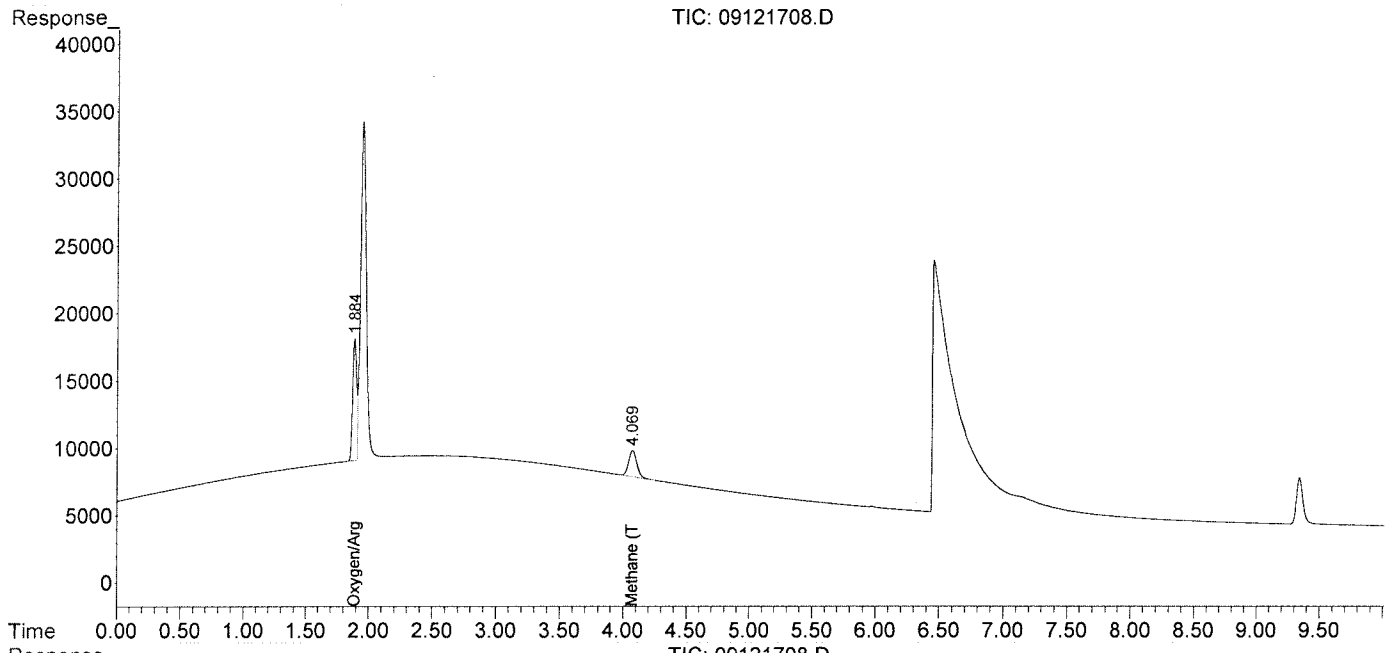
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.884	196022	0.124	ppm
2)	Carbon monoxide	1.884	196022	N.D.	ppm
3)	Methane (TCD)	4.070f	88282	782.730	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.044	5189849	539.759	ppm
7)	Ethylene	1.573	10007759	590.286	ppm
8)	Ethane	1.822	10048964	583.213	ppm
9)	Propylene	4.160	13569343	562.612	ppm
10)	Propane	4.300	15251326	615.171	ppm
11)	Isobutylene	6.143	9815	NoCal	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

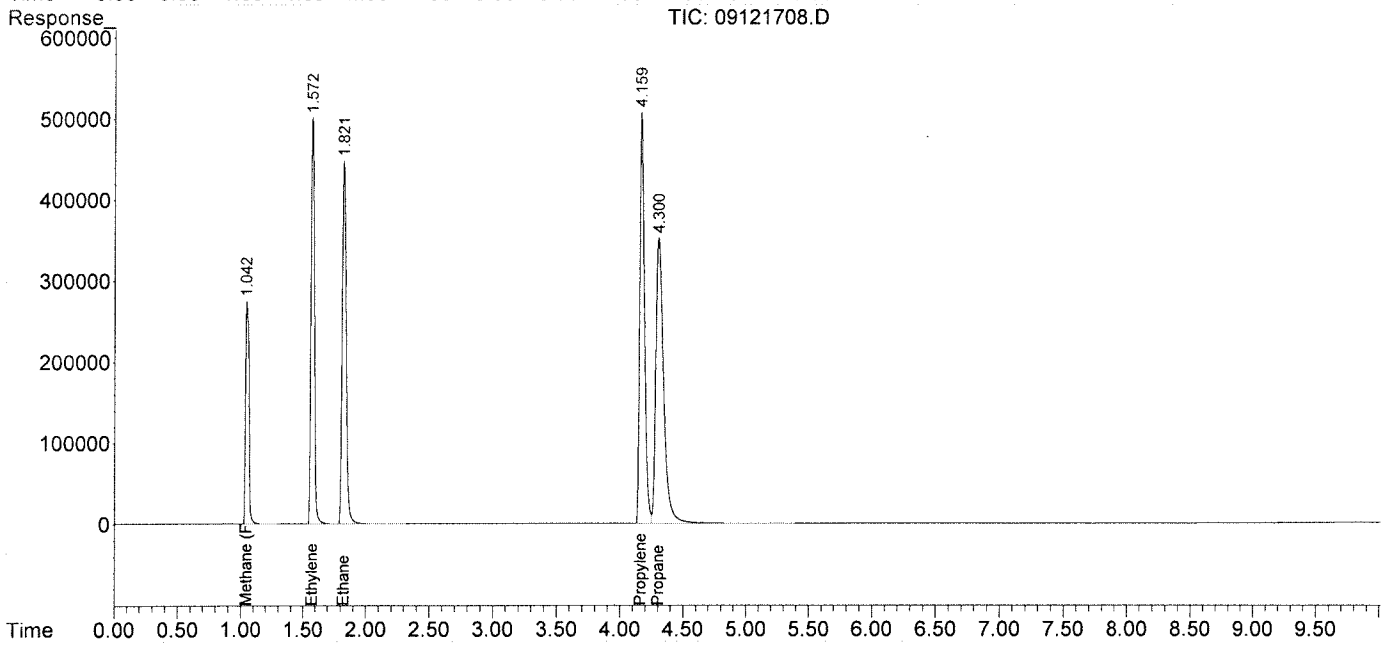
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121708.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:00
Operator : MC
Sample : 600ppm 0.3ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:10:57 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:10:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121709.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:47
Operator : MC
Sample : 1000ppm 0.5ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:11:46 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:11:38 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

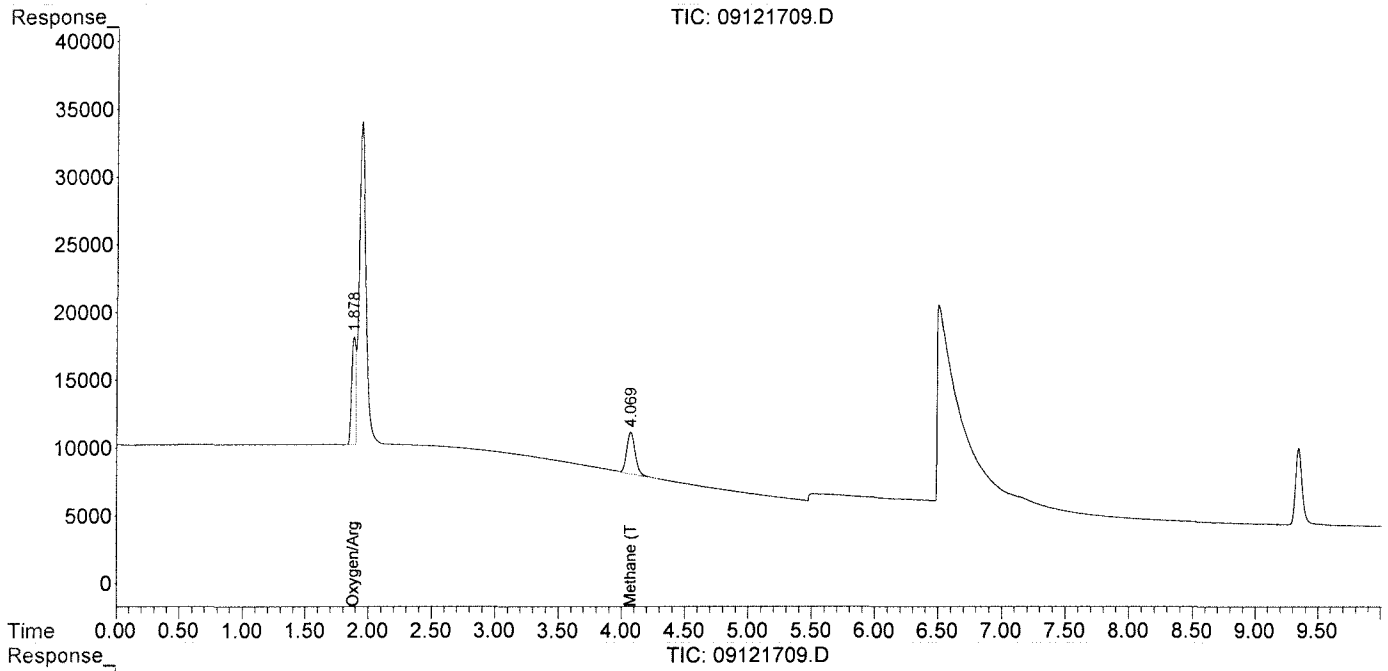
	Compound	R.T.	Response	Conc	Units
Target	Compounds				
1)	Oxygen/Argon	1.879	192611	0.162	ppm
2)	Carbon monoxide	1.879	192611	N.D.	ppm
3)	Methane (TCD)	4.070f	145492	1244.729	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.039	8598534	945.644	ppm
7)	Ethylene	1.576	16608504	981.887	ppm
8)	Ethane	1.827	16709165	973.644	ppm
9)	Propylene	4.161	22494888	941.060	ppm
10)	Propane	4.298	25459411	1023.223	ppm
11)	Isobutylene	6.138	16970	8645.243	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

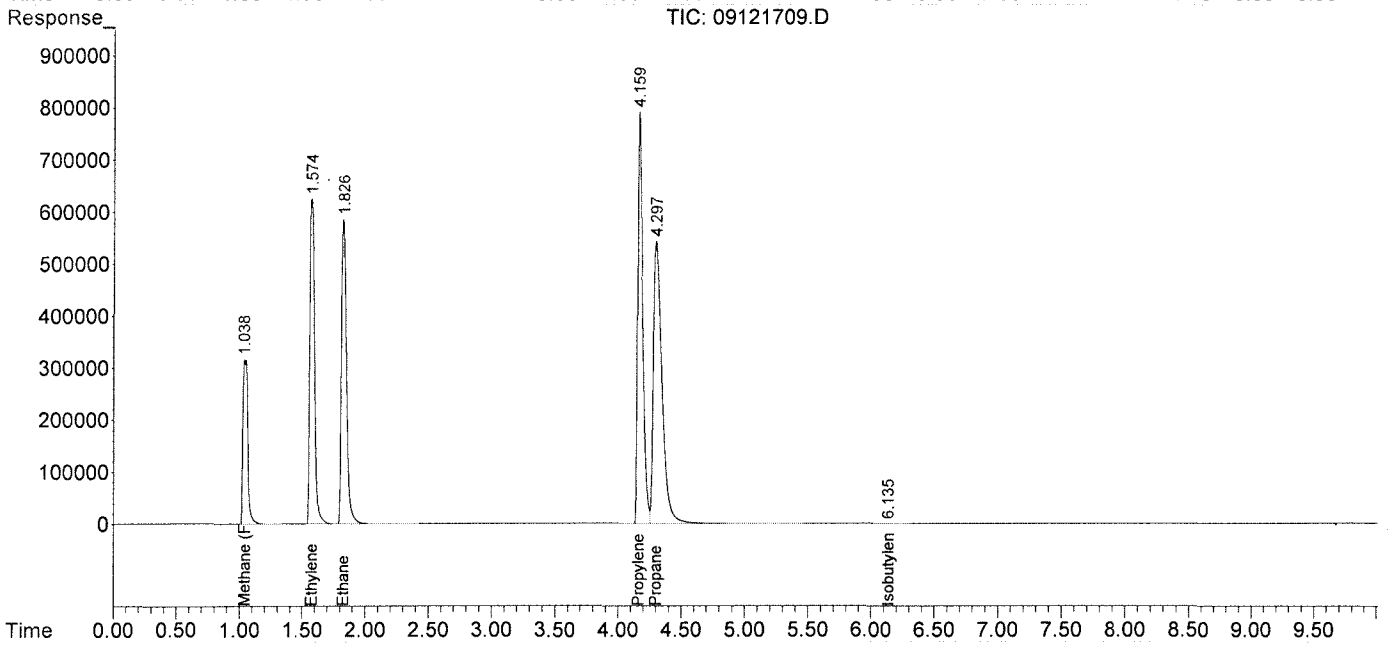
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121709.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:47
Operator : MC
Sample : 1000ppm 0.5ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:11:46 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:11:38 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121710.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:07
Operator : MC
Sample : 2000ppm 1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:12:33 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:12:25 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

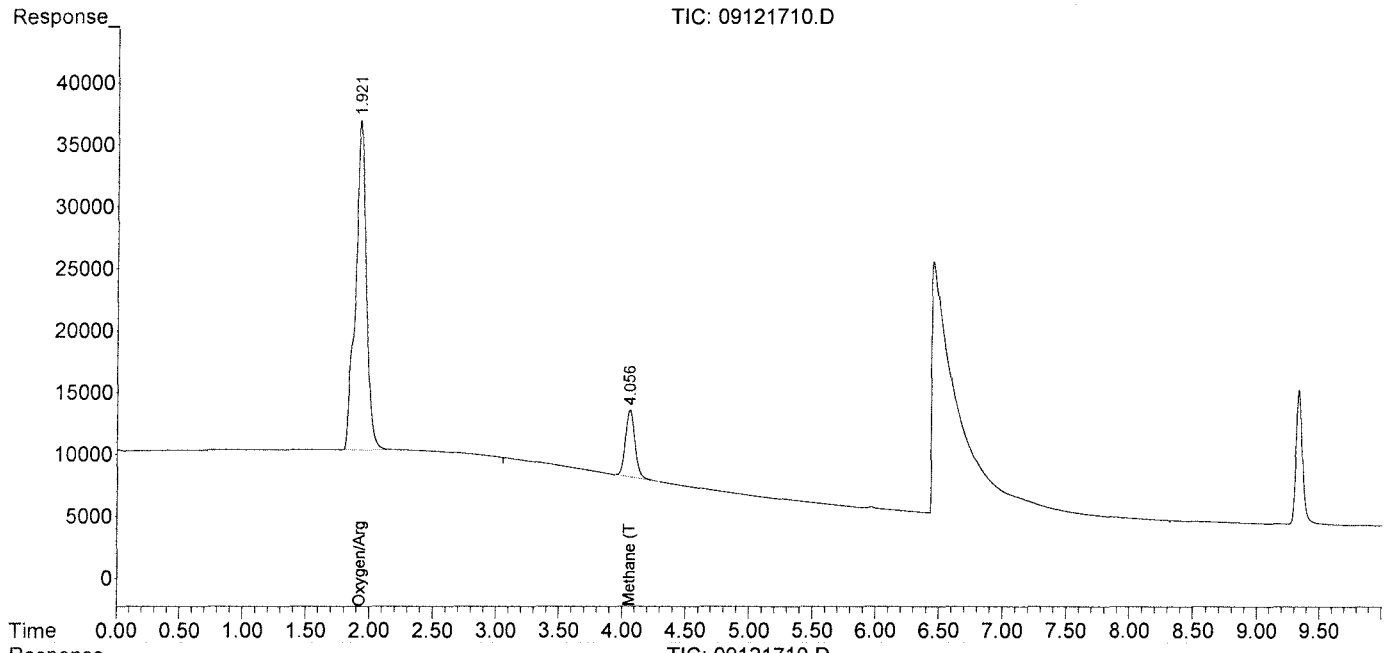
	Compound	R.T.	Response	Conc	Units	
Target	Compounds					
1)	Oxygen/Argon	1.922f	1578147	1.659	ppm	
2)	Carbon monoxide	1.922f	1578147	N.D.	ppm	
3)	Methane (TCD)	4.057f	281651	3526.607	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.016	16098209	1763.622	ppm	
7)	Ethylene	1.552	31192444	1848.268	ppm	
8)	Ethane	1.801	31424218	1837.143	ppm	
9)	Propylene	4.129	42124690	1775.341	ppm	m
10)	Propane	4.269	48583085	1946.921	ppm	
11)	Isobutylene	6.136	33832	25613.603	ppm	
12)	Isobutane	6.576f	3845	0.120	ppm	
13)	n-Butane	6.576f	3845	0.120	ppm	

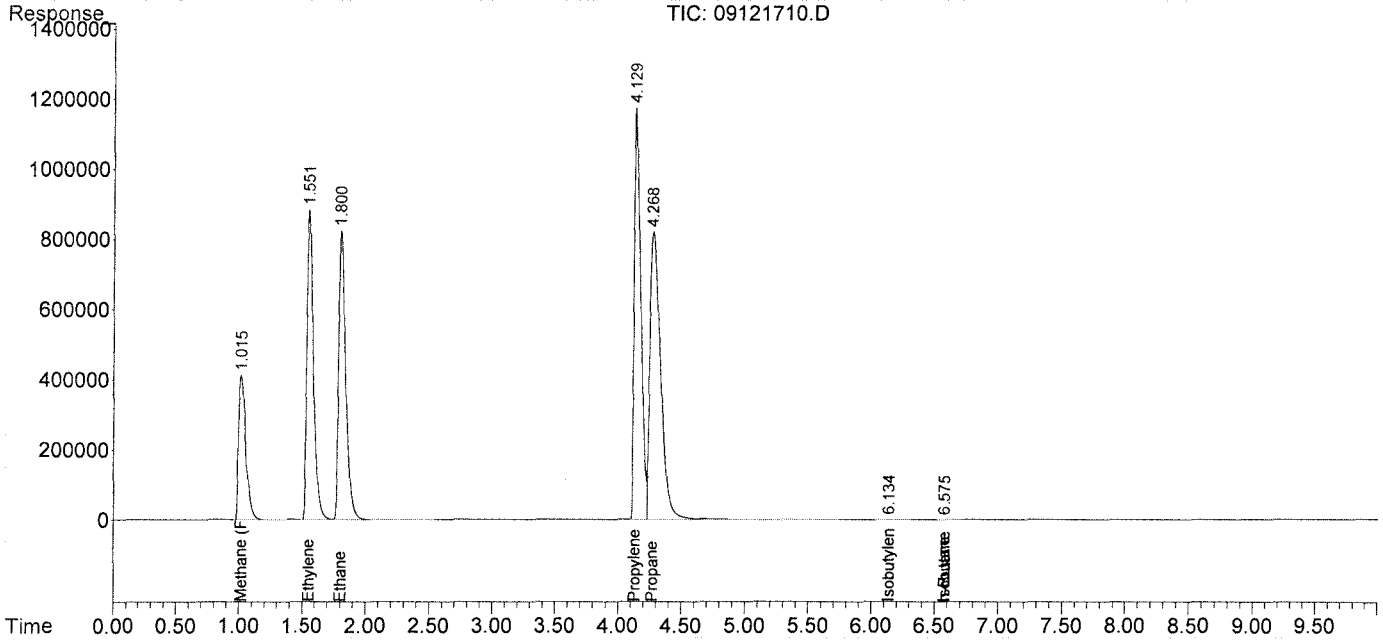
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121710.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:07
Operator : MC
Sample : 2000ppm 1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:12:33 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:12:25 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

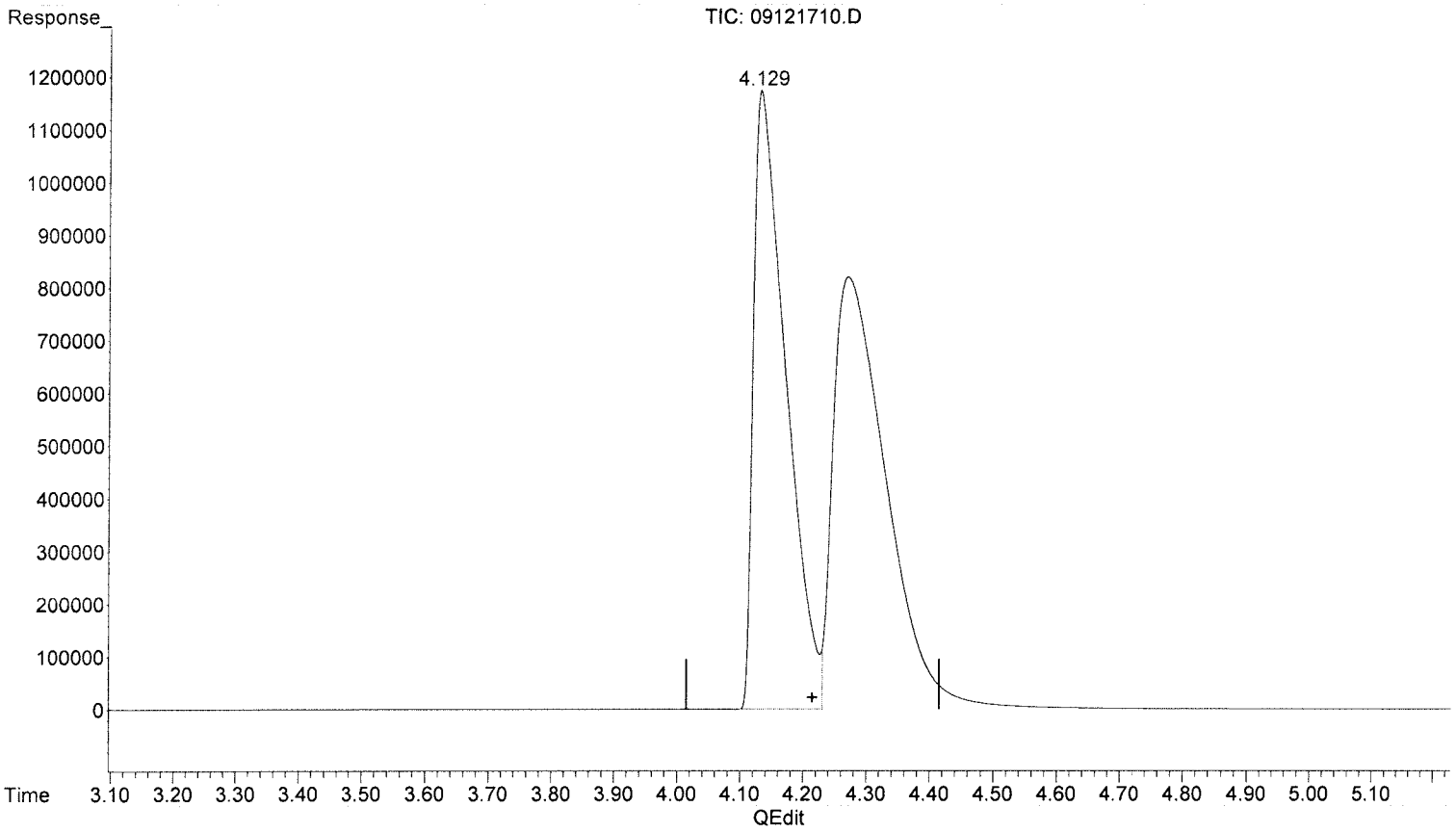




Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121710.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:07
Operator : MC
Sample : 2000ppm 1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:12:33 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:12:25 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(9) Propylene
4.129min 1775.341 ppm m
response 42124690

(+) = Expected Retention Time
RS091217_R.M Wed Sep 13 15:08:03 2017

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121711.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:48
Operator : MC
Sample : 4000ppm 0.1ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:13:37 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

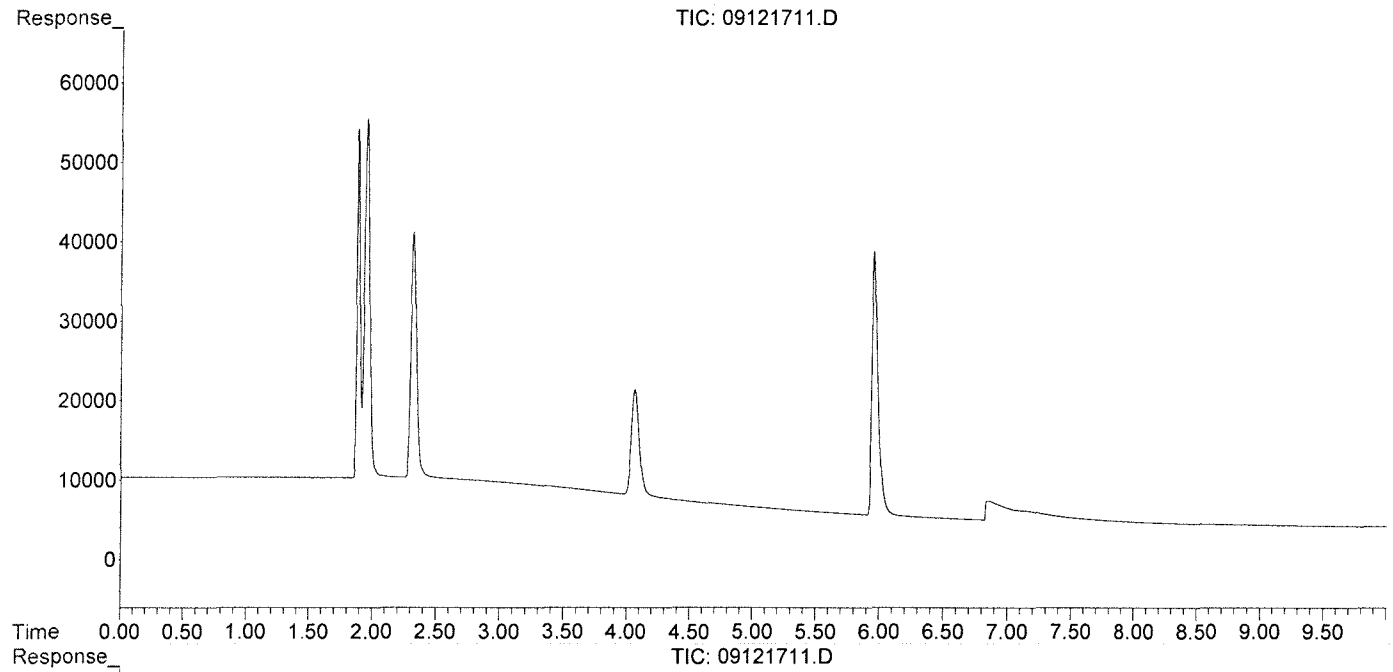
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	0.000	0	N.D.	ppm	d
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	0.000	0	N.D.	ppm	d
6)	Methane (FID)	1.059	35776839	3925.122	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

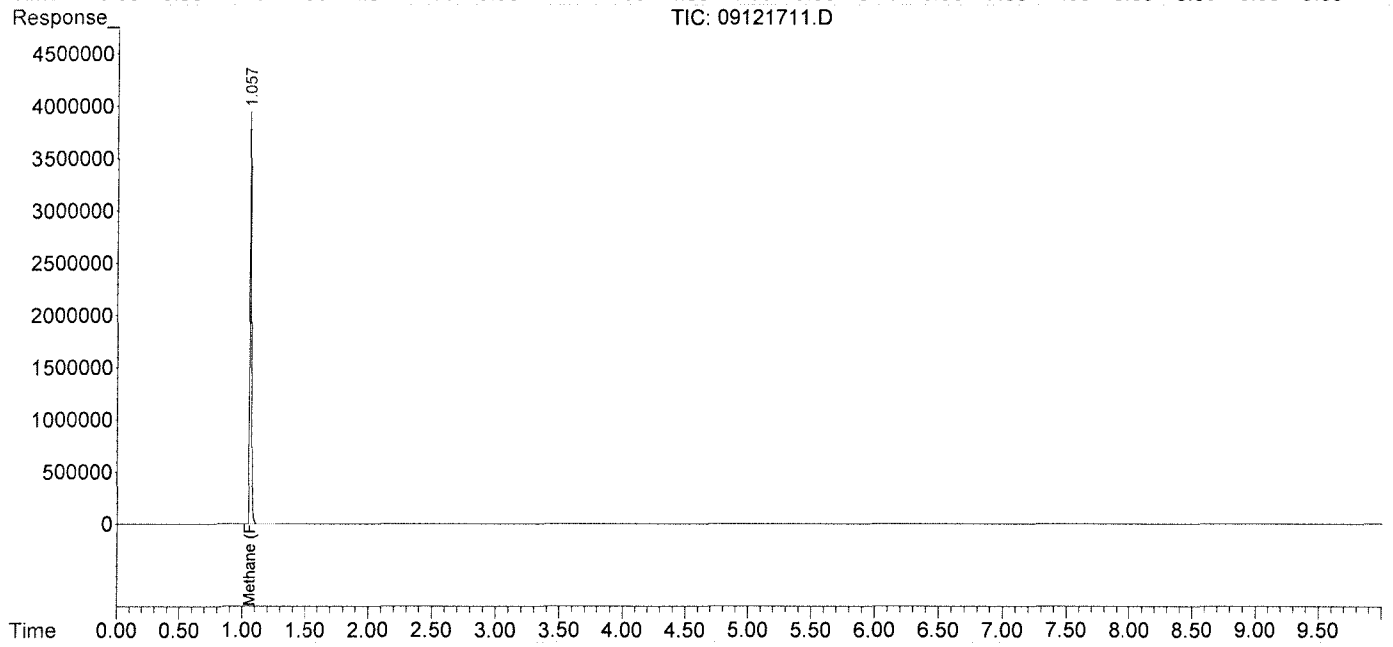
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121711.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:48
Operator : MC
Sample : 4000ppm 0.1ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:13:37 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121712.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 15:21
Operator : MC
Sample : 20000ppm 0.5ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:14:17 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

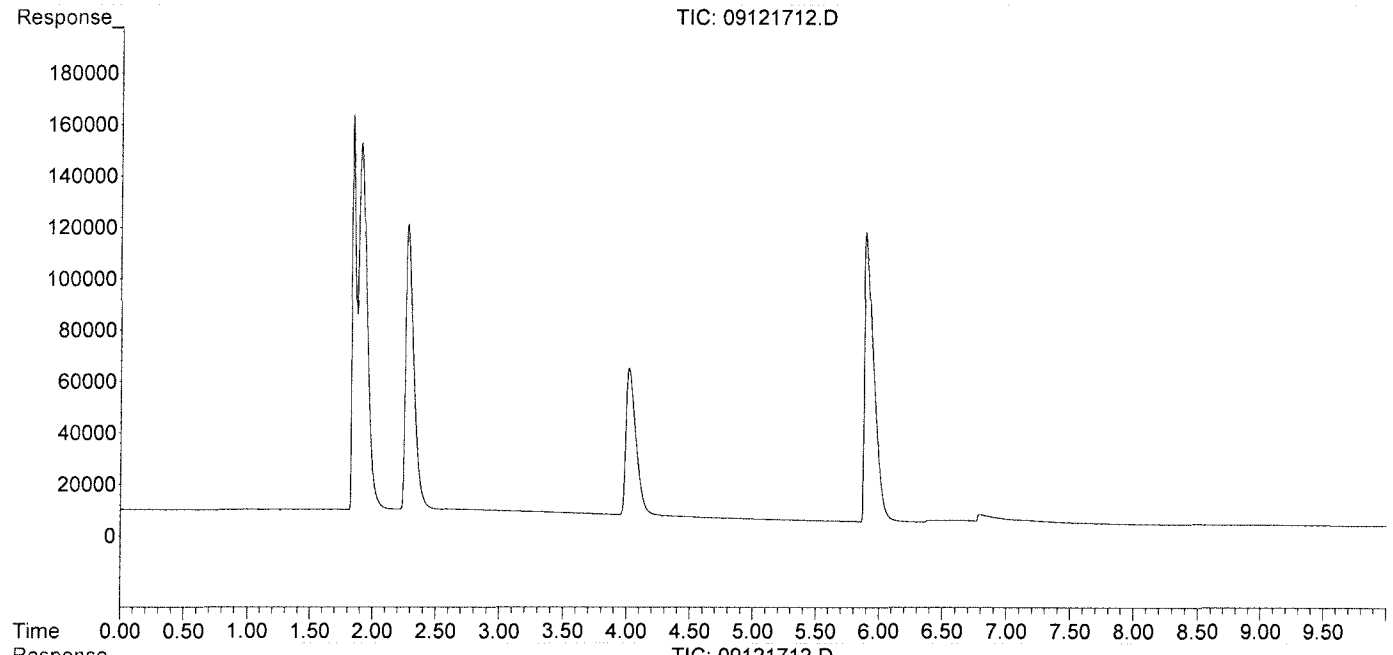
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.836	3190788	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	0.000	0	N.D.	ppm	d
6)	Methane (FID)	1.034	169009160	18492.064	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

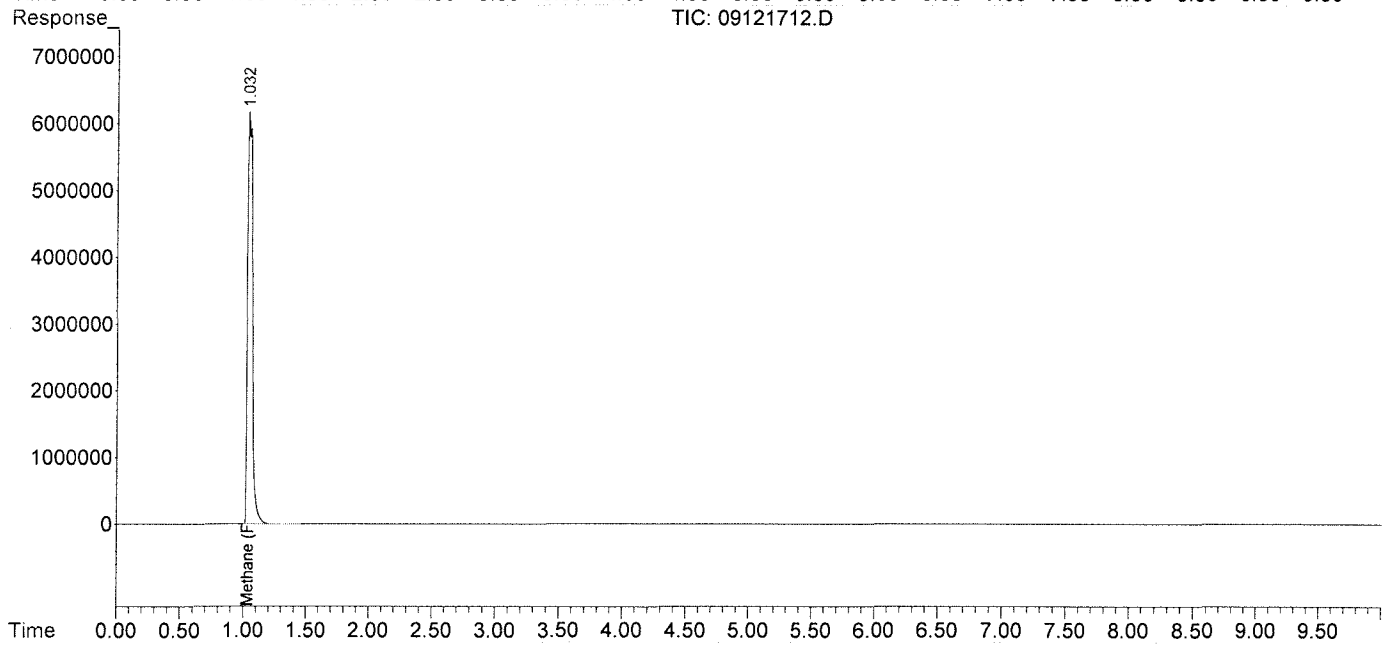
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121712.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 15:21
Operator : MC
Sample : 20000ppm 0.5ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:14:17 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 16:15
Operator : MC
Sample : icv s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:15:11 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.843	2922459	3.687	ppm	
2)	Carbon monoxide	1.843	2922459	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	actual 1.5
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.063	13748	1.516	ppm	~~1.50~~ 1.50 101.1
7)	Ethylene	1.598	24153	1.443	ppm	~~1.50~~ 1.50 96.2
8)	Ethane	1.850	24488	1.445	ppm	~~1.50~~ 1.50 96.3
9)	Propylene	4.221	36004	1.537	ppm	~~1.50~~ 1.50 102.5
10)	Propane	4.350	37738	1.517	ppm	~~1.51~~ 1.51 100.5
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.579f	48019	1.804	ppm	9/14/17
13)	n-Butane	6.579f	48019	1.804	ppm	

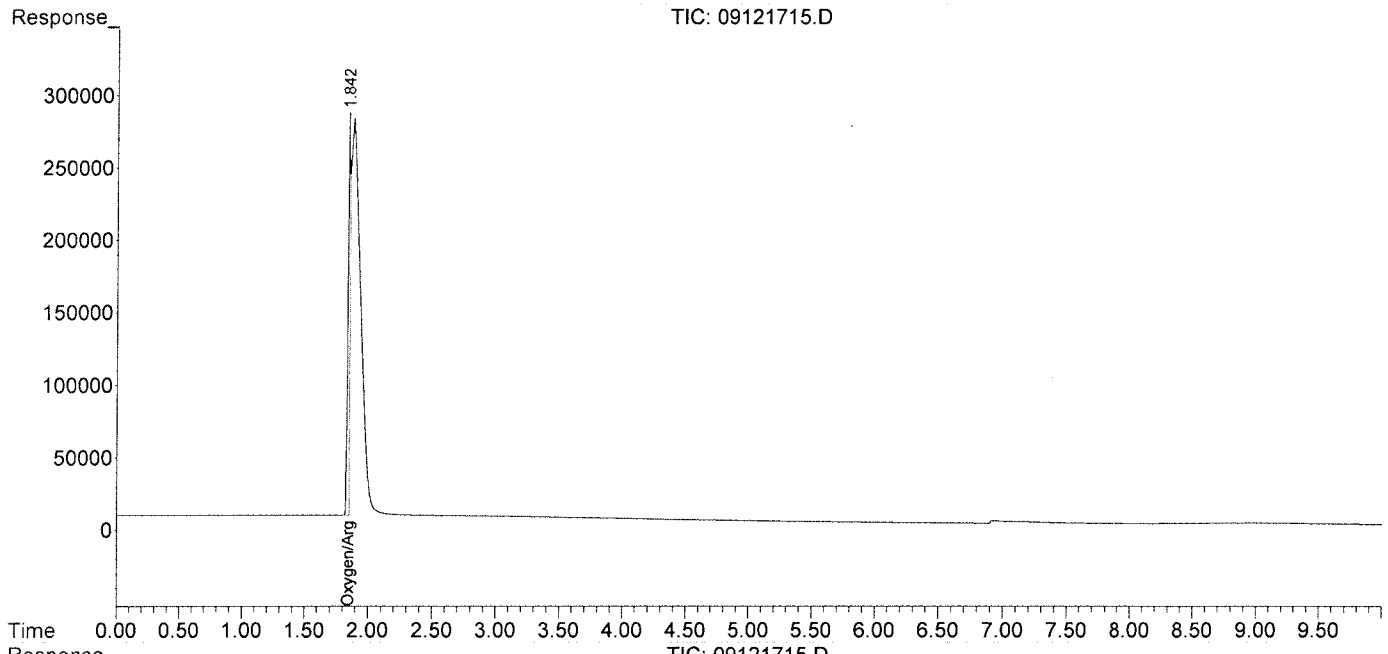
(f)=RT Delta > 1/2 Window (m)=manual int.

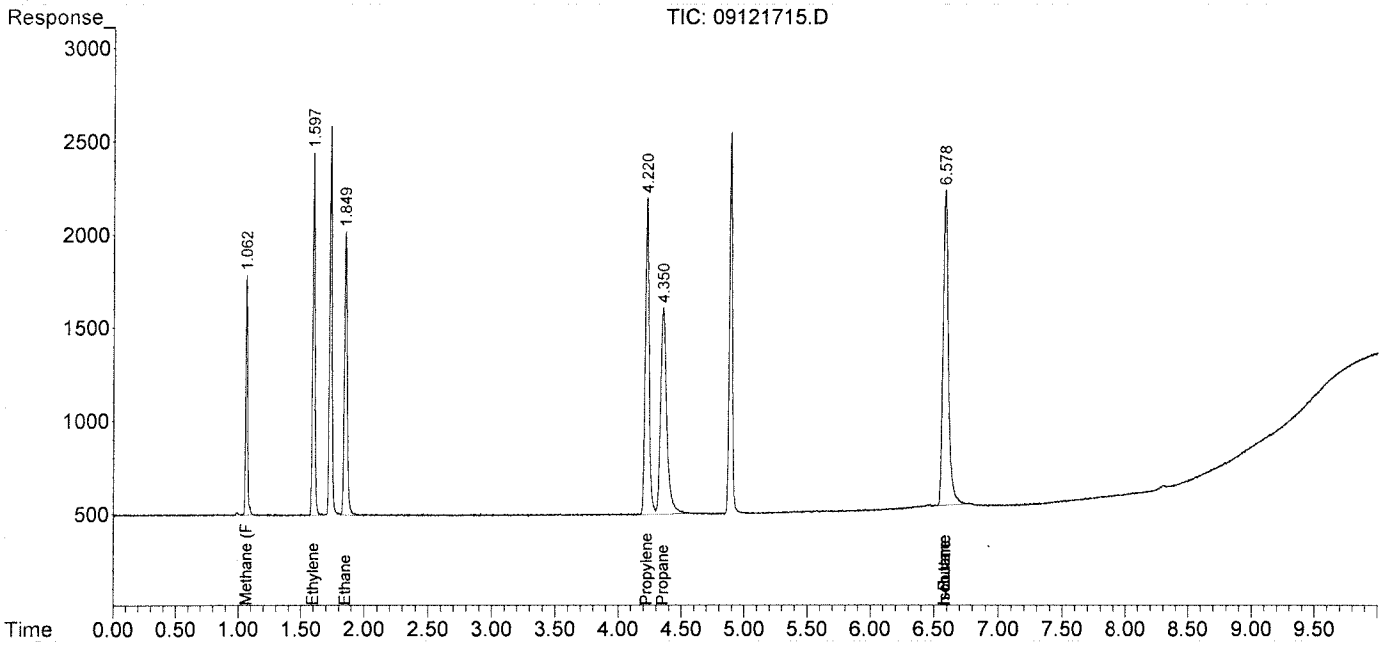
9/14/17

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 16:15
Operator : MC
Sample : icv s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:15:11 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Dissolved Gases by RSK175

ALS Environmental

Method : RSK175 Headspace Method for Dissolved Hydrocarbon in Water by FID/TCD
Client : ALS Laboratory Group
Service Request: P2003888
Sample Vol. (ml) : 32.00 ml
Analyst : LD
Date Analysis : 07/20/20
Head Space Vol.(ml) : 8.00 ml
Instrument : GC#10
Detector : FID#10, TCD#10
Gas Constant : 24.05684 (20°C)

HEAD SPACE RESULT (ppm)

Sample ID	Inj. Vol.	Methane	Ethylene	Ethane
STD S32-05221901	0.100	95.235	101.505	101.478
ACTUAL		101.50	100.90	101.40
%Difference		6.2%	0.6%	0.1%
MCS 0.1ml	0.100	0.110	0.000	0.000
RB 0.1ml	0.100	0.000	0.000	0.000
LCS FID 0.1ml	0.100	1.325	1.121	1.210
LCSD FID 0.1ml	0.100	1.343	1.123	1.223
P2003888-001 0.1ml	0.100	1.013	0.000	0.000
P2003888-002 0.1ml	0.100	0.342	0.000	0.000
P2003888-003 0.1ml	0.100	0.245	0.000	0.000
P2003888-004 0.1ml	0.100	0.488	0.000	0.000
P2003888-005 0.1ml	0.100	1.079	0.000	0.000
P2003888-006 0.1ml	0.100	0.358	0.000	0.000
P2003888-001 MS 0.1ml	0.100	2.394	0.992	1.102
P2003888-001 MSD 0.1r	0.100	2.467	1.011	1.102
STD S32-05221901		93.173	99.289	98.810
ACTUAL		101.50	100.90	101.40
%Difference		8.2%	1.6%	2.6%

FINAL HEAD SPACE RESULT (ppm)

	Methane	Ethylene	Ethane
WWt.	16.04	28.05	30.07
HENRY'S CONSTANT	3.76E+04	1.02E+04	2.63E+04
RL	1.30	1.00	0.60
MCS 0.1ml	1.100	0.000	0.000
LCS FID 0.1ml	13.250	11.210	12.100
LCSD FID 0.1ml	13.430	11.230	12.230
P2003888-001 0.1ml	10.130	0.000	0.000
P2003888-002 0.1ml	3.420	0.000	0.000
P2003888-003 0.1ml	2.450	0.000	0.000
P2003888-004 0.1ml	4.880	0.000	0.000
P2003888-005 0.1ml	10.790	0.000	0.000
P2003888-006 0.1ml	3.580	0.000	0.000
P2003888-001 MS 0.1ml	23.940	9.920	11.020
P2003888-001 MSD 0.1ml	24.670	10.110	11.020
16:55:00	0.36	0.00	0.00

MP 07/21

Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202001 D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 12:28:43
Operator : LD
Sample : STD S32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 12:49:20 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

LD 07/20

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

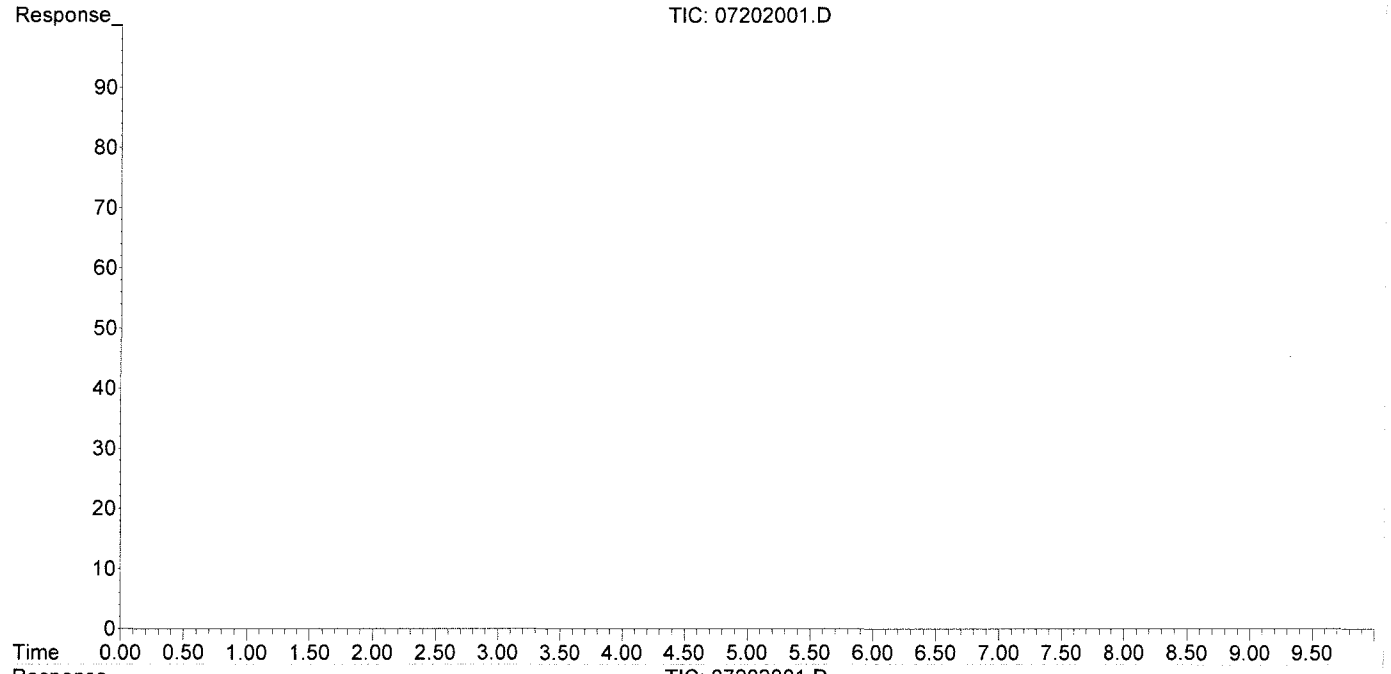
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.098	863844	95.235	ppm
7)	Ethylene	1.664	1698610	101.505	ppm
8)	Ethane	1.927	1720076	101.478	ppm
9)	Propylene	4.305	2503442	106.841	ppm
10)	Propane	4.427	2578244	103.626	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

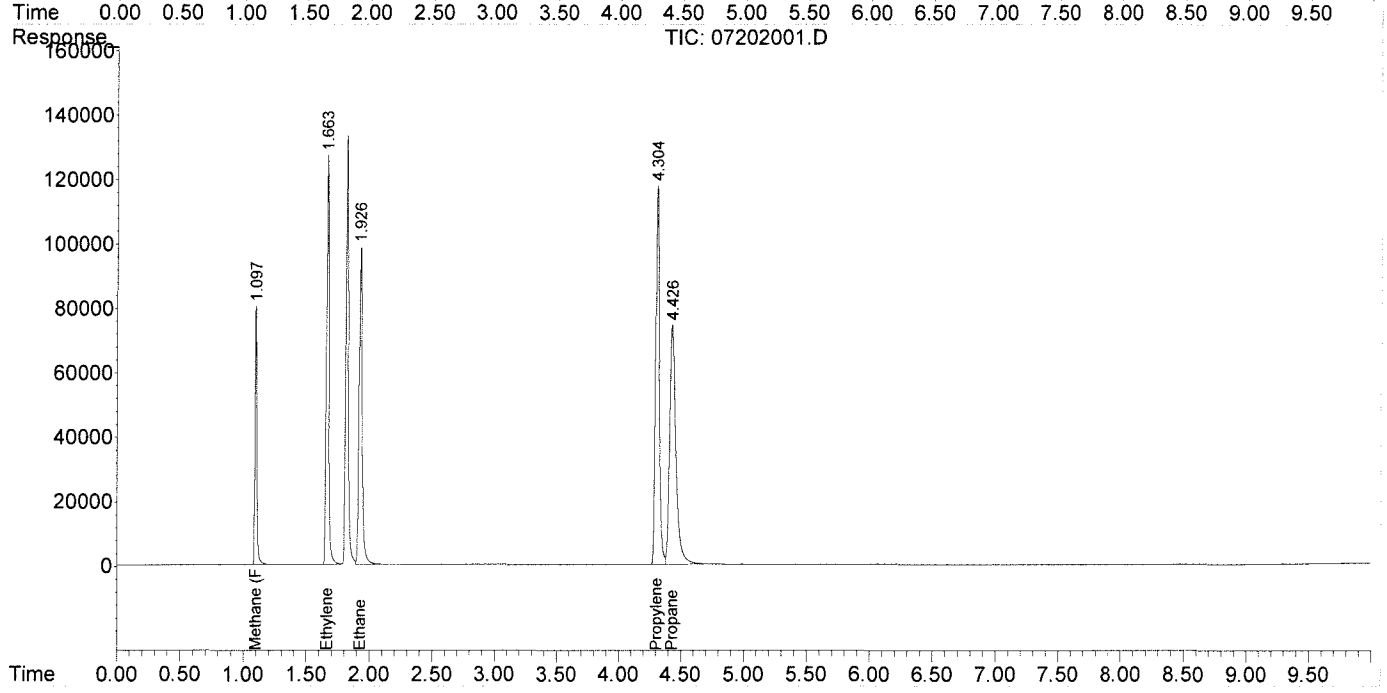
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202001.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 12:28:43
Operator : LD
Sample : STD S32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 12:49:20 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202015.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 17:08:45
Operator : LD
Sample : STD S32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 17:20:55 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

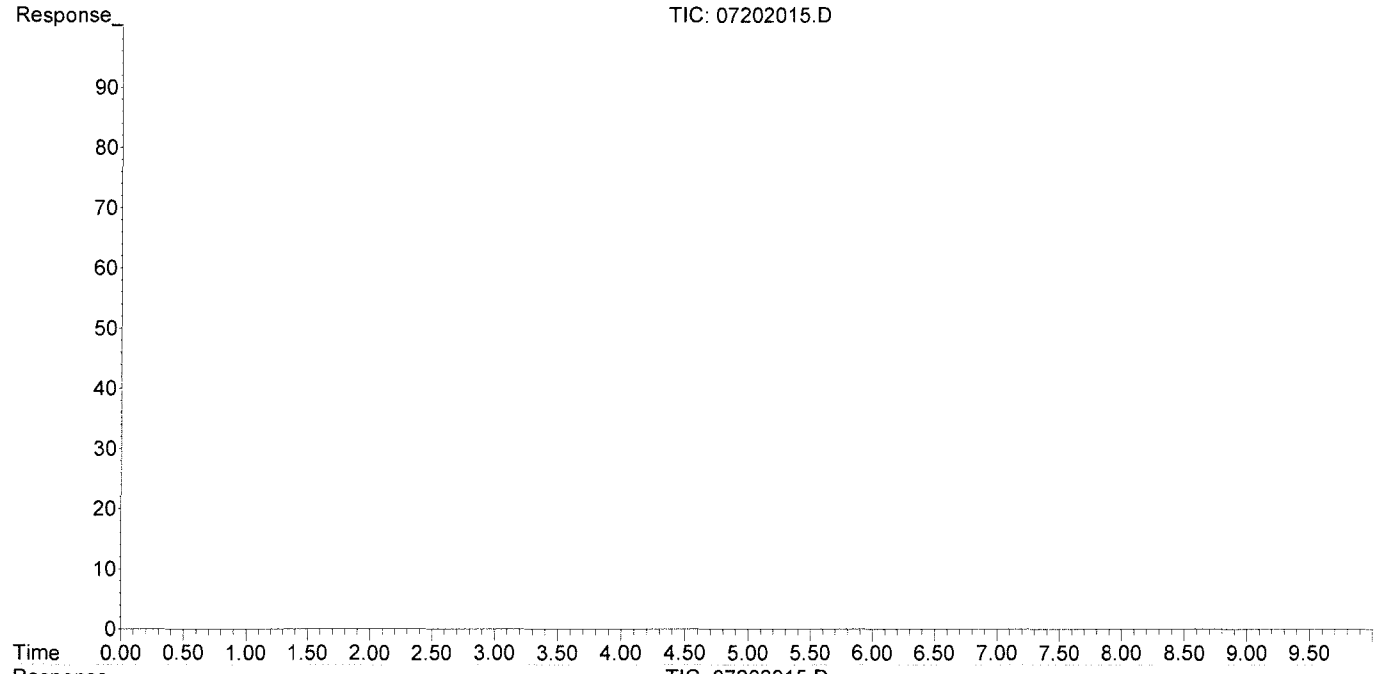
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.097	845135	93.173	ppm
7)	Ethylene	1.661	1661536	99.289	ppm
8)	Ethane	1.924	1674843	98.810	ppm
9)	Propylene	4.301	2437272	104.017	ppm
10)	Propane	4.423	2510948	100.921	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

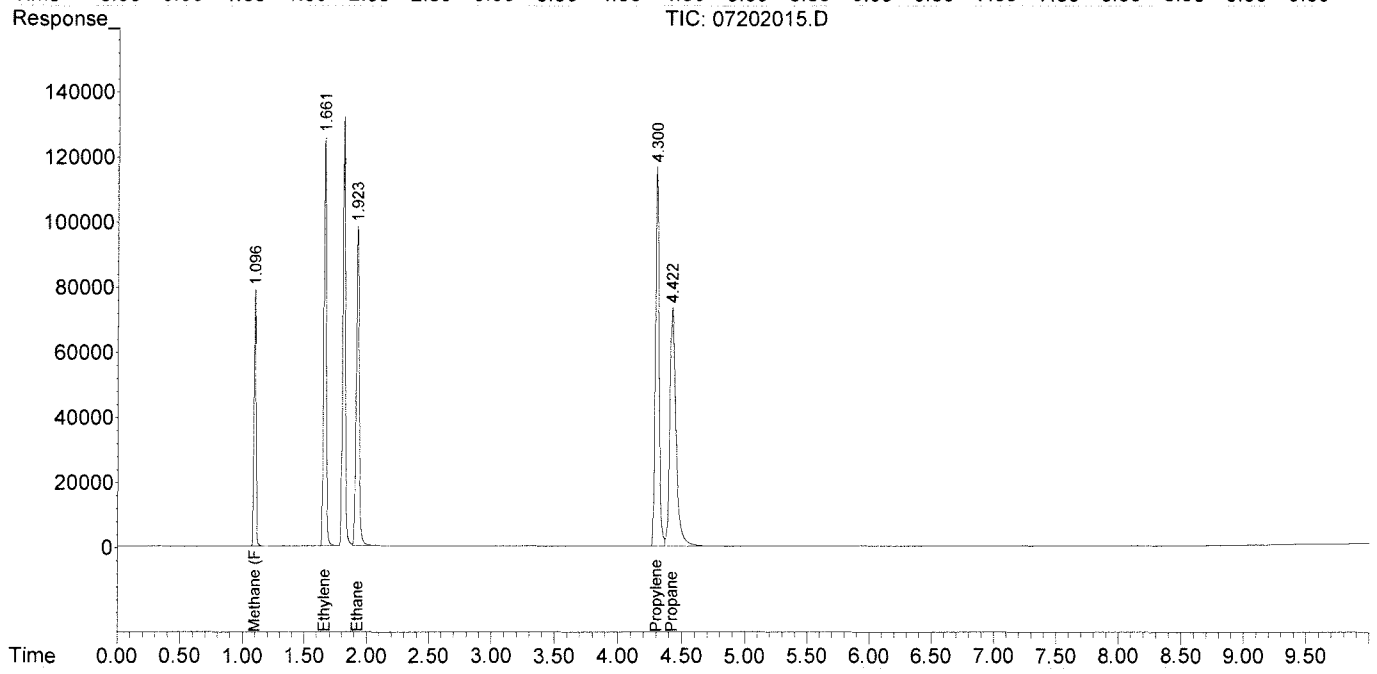
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC10\DATA\RSK_FID\2020_07\20\
Data File : 07202015.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Jul-2020, 17:08:45
Operator : LD
Sample : STD S32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Jul 20 17:20:55 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Injection Log

Directory: I:\GC10\DATA\RSK_FID\2017_09\12\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	12-Sep-17, 08:38:08	09121701.D	test		MC	RSKBOTH.M	
2	12-Sep-17, 10:52:40	09121702.D	0.151ppm 0.250ml s32-09121702		MC	RSKBOTH.M	Curve
3	12-Sep-17, 11:05:49	09121703.D	0.302ppm 0.5ml s32-09121702		MC	RSKBOTH.M	Curve
4	12-Sep-17, 11:45:34	09121704.D	1.51ppm 0.1ml s32-09051701		MC	RSKBOTH.M	Curve
5	12-Sep-17, 12:09:33	09121705.D	4.53ppm 0.3ml s32-09051701		MC	RSKBOTH.M	Curve
6	12-Sep-17, 12:30:23	09121706.D	10.57ppm 0.7ml s32-09051701		MC	RSKBOTH.M	Curve
7	12-Sep-17, 12:47:18	09121707.D	200ppm 0.1ml s32-09121701		MC	RSKBOTH.M	Curve
8	12-Sep-17, 13:00:22	09121708.D	600ppm 0.3ml s32-09121701		MC	RSKBOTH.M	Curve
9	12-Sep-17, 13:47:48	09121709.D	1000ppm 0.5ml s32-09121701		MC	RSKBOTH.M	Curve
10	12-Sep-17, 14:07:58	09121710.D	2000ppm 1ml s32-09121701		MC	RSKBOTH.M	Curve
11	12-Sep-17, 14:48:48	09121711.D	4000ppm 0.1ml s32-08231701		MC	RSKBOTH.M	Curve
12	12-Sep-17, 15:21:51	09121712.D	20000ppm 0.5ml s32-08231701		MC	RSKBOTH.M	Curve
13	12-Sep-17, 15:38:59	09121713.D	mb 0.5ml		MC	RSKBOTH.M	Pass
14	12-Sep-17, 15:55:35	09121714.D	mb 0.1ml		MC	RSKBOTH.M	Pass
15	12-Sep-17, 16:15:26	09121715.D	icv s30-05241604		MC	RSKBOTH.M	Pass

Injection Log

Directory: I:\GC10\DATA\RSK_FID\2020_07\20\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	20-Jul-20, 12:28:43	07202001.D	STD S32-05221901		LD	RSKBOTH.M	pass
2	20-Jul-20, 12:53:00	07202002.D	RB 0.1ml		LD	RSKBOTH.M	pass
3	20-Jul-20, 13:26:13	07202003.D	MCS 0.1ml		LD	RSKBOTH.M	pass
4	20-Jul-20, 13:42:17	07202004.D	LCS FID 0.1ml		LD	RSKBOTH.M	pass
5	20-Jul-20, 13:55:32	07202005.D	LCSD FID 0.1ml		LD	RSKBOTH.M	pass
6	20-Jul-20, 14:08:24	07202006.D	P2003888-001 0.1		LD	RSKBOTH.M	
7	20-Jul-20, 14:23:06	07202007.D	xxxxP2003888-001 MS		LD	RSKBOTH.M	
8	20-Jul-20, 14:37:43	07202008.D	P2003888-001 MS 0.1ml		LD	RSKBOTH.M	pass
9	20-Jul-20, 14:50:46	07202009.D	P2003888-001 MSD 0.1ml		LD	RSKBOTH.M	pass
10	20-Jul-20, 15:06:18	07202010.D	P2003888-002 0.1ml		LD	RSKBOTH.M	
11	20-Jul-20, 15:21:18	07202011.D	P2003888-003 0.1ml		LD	RSKBOTH.M	
12	20-Jul-20, 16:21:07	07202012.D	P2003888-004 0.1ml		LD	RSKBOTH.M	
13	20-Jul-20, 16:38:33	07202013.D	P2003888-005 0.1ml		LD	RSKBOTH.M	
14	20-Jul-20, 16:55:00	07202014.D	P2003888-006 0.1ml		LD	RSKBOTH.M	
15	20-Jul-20, 17:08:45	07202015.D	STD S32-05221901		LD	RSKBOTH.M	pass

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

July 30, 2020

Analytical Report for Service Request No: K2005927

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: ALS Houston DOD TOC

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory July 15, 2020
For your reference, these analyses have been assigned our service request number **K2005927.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

for Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

Table of Contents

Acronyms
Qualifiers
State Certifications, Accreditations, And Licenses
Case Narrative
Chain of Custody
General Chemistry
Raw Data
    General Chemistry

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
LOD	Limit of Detection
LOQ	Limit of Quantitation
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.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
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.
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.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

Client: ALS Environmental - US
Project: ALS Houston DOD TOC
Sample Matrix: Ground Water

Service Request: K2005927
Date Received: 07/15/2020

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 ground water samples were received for analysis at ALS Environmental on 07/15/2020. 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.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Sydney A Wolfe Date 07/30/2020

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

L20059277

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:** **14266**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626 **Phone:** +1 360 501 3312

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:	HS20070400
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20070400-04**	**50WW14-200709**	**Groundwater**	**09 Jul 2020 07:40**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			24 Jul 2020
2.	**HS20070400-05**	**50WW13-200709**	**Groundwater**	**09 Jul 2020 08:45**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			24 Jul 2020
3.	**HS20070400-06**	**50WW11-200709**	**Groundwater**	**09 Jul 2020 09:45**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			24 Jul 2020
4.	**HS20070400-07**	**50WW11-200709-FD**	**Groundwater**	**09 Jul 2020 09:45**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			24 Jul 2020
5.	**HS20070400-08**	**50WW06-200709**	**Groundwater**	**09 Jul 2020 10:45**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			24 Jul 2020
6.	**HS20070400-09**	**50WW12-200709**	**Groundwater**	**09 Jul 2020 11:40**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			24 Jul 2020

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS20070400-04 = MS/MSD

QC Level: DOD IV (DoD Data Package)

PC KL

Cooler Receipt and Preservation Form

Client ALS Houston Service Request K20 05927

Received: JUL 15 2020 Opened: JUL 15 2020 By: CG Unloaded: JUL 15 2020 By: CG

1. Samples were received via? USPS (Fed Ex) UPS DHL PDX Courier Hand Delivered
2. Samples were received in: (circle) (Cooler) Box Envelope Other _____ NA
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2 Front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Temp Blank	Sample 1	Sample 2	Sample 3	Sample 4	IR GUN	Cooler / COC ID NA	Tracking Number NA	Filed
16.6	16.5	16.7	16.8	16.8	IR02	14266	1891 8878 2832	

4. Packing material: Inserts (Baggies) (Bubble Wrap) Gel Packs (Wet Ice) Dry Ice Sleeves (Melted)
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA Y (N)
   If applicable, tissue samples were received: *Frozen Partially Thawed Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA (Y) N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K2005927
Project:	ALS Houston DOD TOC	**Date Collected:**	07/9/20
Sample Matrix:	Ground Water	**Date Received:**	07/15/20
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
50WW14-200709	K2005927-001	**0.84**	0.50	0.20	0.07	1	07/27/20 12:28	
50WW13-200709	K2005927-002	**1.39**	0.50	0.20	0.07	1	07/27/20 12:28	
50WW11-200709	K2005927-003	**1.18**	0.50	0.20	0.07	1	07/27/20 12:28	
50WW11-200709-FD	K2005927-004	**1.16**	0.50	0.20	0.07	1	07/27/20 12:28	
50WW06-200709	K2005927-005	**9.31**	0.50	0.20	0.07	1	07/27/20 12:28	
50WW12-200709	K2005927-006	**0.73**	0.50	0.20	0.07	1	07/27/20 12:28	
Method Blank	K2005927-MB	ND U	0.50	0.20	0.07	1	07/27/20 12:28	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2005927
Project	ALS Houston DOD TOC	**Date Collected:**	07/09/20
Sample Matrix:	Ground Water	**Date Received:**	07/15/20
		Date Analyzed:	07/27/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	50WW14-200709	**Units:**	mg/L
Lab Code:	K2005927-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K2005927-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	0.84	0.59	0.717	36 #	10

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

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2005927
Project:	ALS Houston DOD TOC	**Date Collected:**	07/09/20
Sample Matrix:	Ground Water	**Date Received:**	07/15/20
		Date Analyzed:	07/27/20
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	50WW14-200709	**Units:**	mg/L
Lab Code:	K2005927-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K2005927-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	0.84	26.6	25.0	103	83-117

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.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2005927
Project:	ALS Houston DOD TOC	**Date Analyzed:**	07/27/20
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	688594

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2005927-LCS	27.1	25.0	109	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K2005927
Project: ALS Houston DOD TOC

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	688594	KQ2010275-03	07/27/20 12:28	25.0	25.8	103	90-110
CCV2	688594	KQ2010275-04	07/27/20 12:28	25.0	25.2	101	90-110
CCV3	688594	KQ2010275-05	07/27/20 12:28	25.0	25.0	100	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K2005927
Project: ALS Houston DOD TOC

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

Analysis Method: SM 5310 C **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	688594	KQ2010275-06	07/27/20 12:28	0.50	0.20	0.07	ND	U
CCB2	688594	KQ2010275-07	07/27/20 12:28	0.50	0.20	0.07	ND	U
CCB3	688594	KQ2010275-08	07/27/20 12:28	0.50	0.20	0.07	ND	U

Raw Data

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

Work Request # Original (5902) 5927 6089 6138 5937 6282

Tier: II IV II II IV II

Date Analyzed: 7/27/20

Analyst: MK Run # 688594 / 688595 / 688596

Analysis: TOC / DOC

DATA QUALITY REPORT
INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1.	Is the method name and number correct and appropriate?	yes/no/NA
2.	Holding times met for all analyses and for all samples?	yes/no/NA
3.	Are calculations correct?	yes/no/NA
4.	Is the reporting basis correct? (Dry Weight)	yes/no/NA
5.	All quality control criteria met?	yes/no
6.	Is the calibration curve correlation coefficient ≥ 0.995?	yes/no/NA
7.	MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?	yes/no/NA
8.	Are ICVs, CCVs, and CCBs all within acceptance limits?	yes/no/NA
9.	Are results for methods blanks all ND?	yes/no/NA
10.	Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)	yes/no/NA
11.	Are all exceptions explained?	yes/no/NA
12.	Have all applicable service requests been reviewed?	yes/no/NA
13.	Are all samples labeled correctly?	yes/no/NA
14.	Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V)	yes/no/NA
15.	Are detection limits and units reported correctly?	yes/no/NA
16.	Is the unused space on the benchsheet crossed out?	yes/no/NA
17.	Was analysis turned in by the due date? (n-2) (If not record SR#)	yes/no/NA

COMMENTS:
5927-1 High RPD Sample is less than 5x's MRL

Final Approved by: [signature] Date: 7/29/20

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** MKANALY **Analysis Lot:** 688594 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K2005902-006	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			7/27/20 12:28:00	N	II
K2005902-007	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			7/27/20 12:28:00	N	II
K2005902-008	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			7/27/20 12:28:00	N	II
K2005927-001	Carbon, Total Organic	N/A		Ground Water	0.84 mg/L	10 mL	0.84 mg/L	1	0.07	0.50			7/27/20 12:28:00	Y	IV
K2005927-002	Carbon, Total Organic	N/A		Ground Water	1.39 mg/L	10 mL	1.39 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	IV
K2005927-003	Carbon, Total Organic	N/A		Ground Water	1.18 mg/L	10 mL	1.18 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	IV
K2005927-004	Carbon, Total Organic	N/A		Ground Water	1.16 mg/L	10 mL	1.16 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	IV
K2005927-005	Carbon, Total Organic	N/A		Ground Water	9.31 mg/L	10 mL	9.31 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	IV
K2005927-006	Carbon, Total Organic	N/A		Ground Water	0.73 mg/L	10 mL	0.73 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	IV
K2006089-001	Carbon, Total Organic	N/A		Water	3.05 mg/L	10 mL	3.05 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	II
K2006089-002	Carbon, Total Organic	N/A		Water	19.49 mg/L	10 mL	19.5 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	II
K2006138-001	Carbon, Total Organic	N/A		Water	4.20 mg/L	10 mL	4.20 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	II
K2006138-003	Carbon, Total Organic	N/A		Water	2.91 mg/L	10 mL	2.91 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	II
KQ2010275-01	Carbon, Total Organic	DUP	K2005927-001	Ground Water	0.59 mg/L	10 mL	0.59 mg/L	1	0.07	0.50		36*	7/27/20 12:28:00	N	IV
KQ2010275-02	Carbon, Total Organic	MS	K2005927-001	Ground Water	26.63 mg/L	10 mL	26.6 mg/L	1	0.07	0.50	103		7/27/20 12:28:00	N	IV
KQ2010275-03	Carbon, Total Organic	CCV		Water	25.81 mg/L	10 mL	25.8 mg/L	1					7/27/20 12:28:00	N	II
KQ2010275-04	Carbon, Total Organic	CCV		Water	25.16 mg/L	10 mL	25.2 mg/L	1					7/27/20 12:28:00	N	II
KQ2010275-05	Carbon, Total Organic	CCV		Water	24.99 mg/L	10 mL	25.0 mg/L	1					7/27/20 12:28:00	N	II
KQ2010275-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			7/27/20 12:28:00	N	II
KQ2010275-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			7/27/20 12:28:00	N	II
KQ2010275-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			7/27/20 12:28:00	N	II
KQ2010275-09	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			7/27/20 12:28:00	N	II
KQ2010275-10	Carbon, Total Organic	LCS		Water	27.14 mg/L	10 mL	27.1 mg/L	1	0.07	0.50	109		7/27/20 12:28:00	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** MKANALY **Analysis Lot:** 688595 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K2005937-001	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			7/27/20 12:28:00	N	IV
K2005937-002	Carbon, Total Organic	N/A		Water	8.45 mg/L	10 mL	8.45 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	IV
K2005937-003	Carbon, Total Organic	N/A		Water	13.71 mg/L	10 mL	13.7 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	IV
K2005937-004	Carbon, Total Organic	N/A		Water	11.63 mg/L	10 mL	11.6 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	IV
K2005937-005	Carbon, Total Organic	N/A		Water	3.43 mg/L	10 mL	3.43 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	IV
K2005937-006	Carbon, Total Organic	N/A		Water	9.04 mg/L	10 mL	9.04 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	IV
K2005937-007	Carbon, Total Organic	N/A		Water	10.59 mg/L	10 mL	10.6 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	IV
K2005937-008	Carbon, Total Organic	N/A		Water	5.16 mg/L	10 mL	5.16 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	IV
K2005937-009	Carbon, Total Organic	N/A		Water	9.64 mg/L	10 mL	9.64 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	IV
K2005937-010	Carbon, Total Organic	N/A		Water	9.58 mg/L	10 mL	9.58 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	IV
K2005937-011	Carbon, Total Organic	N/A		Water	3.65 mg/L	10 mL	3.65 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	IV
K2005937-012	Carbon, Total Organic	N/A		Water	8.62 mg/L	10 mL	8.62 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	IV
K2006282-001	Carbon, Total Organic	N/A		Water	3.10 mg/L	10 mL	3.10 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	II
KQ2010277-01	Carbon, Total Organic	DUP	K2006282-001	Water	3.03 mg/L	10 mL	3.03 mg/L	1	0.07	0.50		2	7/27/20 12:28:00	N	II
KQ2010277-02	Carbon, Total Organic	MS	K2006282-001	Water	29.48 mg/L	10 mL	29.5 mg/L	1	0.07	0.50	106		7/27/20 12:28:00	N	II
KQ2010277-03	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			7/27/20 12:28:00	N	IV
KQ2010277-04	Carbon, Total Organic	LCS		Water	26.64 mg/L	10 mL	26.6 mg/L	1	0.07	0.50	107		7/27/20 12:28:00	N	IV
KQ2010277-05	Carbon, Total Organic	CCV		Water	24.99 mg/L	10 mL	25.0 mg/L	1					7/27/20 12:28:00	N	IV
KQ2010277-06	Carbon, Total Organic	CCV		Water	24.91 mg/L	10 mL	24.9 mg/L	1					7/27/20 12:28:00	N	IV
KQ2010277-07	Carbon, Total Organic	CCV		Water	24.70 mg/L	10 mL	24.7 mg/L	1					7/27/20 12:28:00	N	IV
KQ2010277-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			7/27/20 12:28:00	N	IV
KQ2010277-09	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			7/27/20 12:28:00	N	IV
KQ2010277-10	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			7/27/20 12:28:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** MKANALY **Analysis Lot:** 688596 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K2006138-002	Carbon, Dissolved Organic (DOC)	N/A		Water	4.20 mg/L	10 mL	4.20 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	II
K2006138-004	Carbon, Dissolved Organic (DOC)	N/A		Water	2.78 mg/L	10 mL	2.78 mg/L	1	0.07	0.50			7/27/20 12:28:00	N	II
KQ2010278-01	Carbon, Dissolved Organic (DOC)	DUP	K2006138-002	Water	4.25 mg/L	10 mL	4.25 mg/L	1	0.07	0.50		1	7/27/20 12:28:00	N	II
KQ2010278-02	Carbon, Dissolved Organic (DOC)	MS	K2006138-002	Water	30.79 mg/L	10 mL	30.8 mg/L	1	0.07	0.50	106		7/27/20 12:28:00	N	II
KQ2010278-03	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			7/27/20 12:28:00	N	II
KQ2010278-04	Carbon, Dissolved Organic (DOC)	LCS		Water	26.60 mg/L	10 mL	26.6 mg/L	1	0.07	0.50	106		7/27/20 12:28:00	N	II
KQ2010278-05	Carbon, Dissolved Organic (DOC)	CCV		Water	24.91 mg/L	10 mL	24.9 mg/L	1					7/27/20 12:28:00	N	II
KQ2010278-06	Carbon, Dissolved Organic (DOC)	CCV		Water	24.70 mg/L	10 mL	24.7 mg/L	1					7/27/20 12:28:00	N	II
KQ2010278-07	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			7/27/20 12:28:00	N	II
KQ2010278-08	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			7/27/20 12:28:00	N	II
KQ2010278-09	Carbon, Dissolved Organic (DOC)	CCV		Water	25.04 mg/L	10 mL	25.0 mg/L	1					7/27/20 12:28:00	N	II
KQ2010278-10	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			7/27/20 12:28:00	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

688594 (6089 5902 5927 6138)
688595 (5937, 6282)
688596 (6138)

Schedule: 072720

Version: 11
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2020/07/27 17:26 - Monday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K2006089-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
5	Sample	K2005927-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
6	Sample	K2005927-002	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K2005927-003	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K2005927-004	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K2005927-005	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K2005927-006	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K2005927-001DUP	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K2005927-001MS	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K2006089-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K2006089-002	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K2006138-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K2006138-003	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K2005902-006	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K2005902-007	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K2005902-008	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	K2006282-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K2006282-001DUP	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K2006282-001MS	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K2005937-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K2005937-002	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K2005937-003	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K2005937-004	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K2005937-005	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K2005937-006	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K2005937-007	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	K2005937-008	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	K2005937-009	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	K2005937-010	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K2005937-011	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K2005937-012	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K2006138-002	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K2006138-002D	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K2006138-002MS	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

Schedule: 072720

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB3	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
40	Sample	K2006138-004	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample		CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

Fusion Report - 072720
Monday, July 27, 2020 09:42 AM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2020/07/28 10:12 - Tuesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	072720	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v4) Fusion1 (Fusion1) (v6) Fusion1 (Fusion1) (v7) Fusion1 (Fusion1) (v11)		
Comment:			

Report Results

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2020/07/27 09:42

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	9.66	24.84	15.18	49.83	07:59
2	TC Clean	12.53	25.73	13.20	49.81	07:16
3	TC Clean	3.09	16.30	13.22	49.68	07:01
4	TC Clean	1.76	15.09	13.34	49.83	07:04

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2020/07/27 10:16

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.19	13.37	13.18	49.89	08:00
2	TC Clean	4.73	18.18	13.44	49.72	07:16

3	TC Clean	1.60	14.89	13.29	49.91	07:01
4	TC Clean	1.28	14.64	13.36	49.74	07:04

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/07/27 10:50

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	-0.28	13.28	13.56	49.98	08:00
2	TC Clean	4.84	17.85	13.01	49.94	07:15
3	TC Clean	1.86	15.12	13.27	49.74	07:03
4	TC Clean	1.64	14.98	13.33	49.84	07:03

Sample Type: Blank (Creating v1419) — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2020/07/27 11:24

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	-0.35	12.97	13.32	49.67	05:20
2	TC Clean	5.31	18.44	13.13	49.73	07:16
3	TC Clean	2.08	15.42	13.34	49.85	07:03
4	TC Clean	1.74	15.12	13.38	49.74	07:02
5	Reagent Blank	3.49	16.86	13.36	49.82	08:11
6	Acid Blank	-0.02	13.14	13.16	49.99	08:05

Sample Type: Sample — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	3.0537 ppm	0.0000 ppm	0.0000%	2020/07/27 12:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.0537	30.5373	30.56	43.65	13.10	49.99	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.8092 ppm (PASS)	0.0000 ppm	0%	2020/07/27 12:28

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.8092	258.0918	190.94	203.90	12.96	50.05	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/07/27 12:43

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.06	19.36	13.30	49.97	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2020/07/27 12:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.88	18.82	12.94	50.04	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> LCS From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	20.0279 ppm (PASS)	0.0000 ppm	0%	2020/07/27 13:12

NR

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	20.0279	200.2786	150.38	163.86	13.47	50.06	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	25 ppmC

Sample Type: Sample — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	2	TOC	ICS	5.4143 ppm	0.0000 ppm	0.0000%	2020/07/27 13:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.4143	54.1431	47.12	60.58	13.46	50.01	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Sample — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	3	TOC	K2006089-001	3.0793 ppm	0.0870 ppm	2.8300%	2020/07/27 13:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.1408	31.4084	31.17	44.68	13.51	50.04	10:26
2	TOC	3.0178	30.1781	30.30	43.73	13.43	50.04	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> LCS — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	27.1352 ppm (PASS)	0.0000 ppm	0%	2020/07/27 14:10

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	27.1352	271.3523	200.24	213.47	13.23	50.04	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	25 ppmC

Sample Type: Sample — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	5	TOC	K2005927-001	0.8442 ppm	0.1263 ppm	14.9600%	2020/07/27 14:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9335	9.3351	15.68	29.17	13.49	49.99	10:30
2	TOC	0.7549	7.5489	14.43	27.91	13.48	50.00	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Sample — From Schedule Version 4

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	6	TOC	K2005927-002	1.3943 ppm	0.0493 ppm	3.5400%	2020/07/27 14:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4292	14.2918	19.16	32.52	13.36	50.02	10:26
2	TOC	1.3595	13.5947	18.67	32.01	13.34	49.96	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	7	TOC	K2005927-003	1.1762 ppm	0.0120 ppm	1.0200%	2020/07/27 15:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1677	11.6773	17.33	30.78	13.46	50.11	10:28
2	TOC	1.1847	11.8469	17.45	30.49	13.05	50.03	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	8	TOC	K2005927-004	1.1619 ppm	0.0395 ppm	3.4000%	2020/07/27 15:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1339	11.3394	17.09	30.38	13.29	50.15	10:26
2	TOC	1.1898	11.8983	17.48	30.95	13.47	50.15	10:28

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	9	TOC	K2005927-005	9.3094 ppm	0.1287 ppm	1.3800%	2020/07/27 16:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.4004	94.0043	75.08	88.45	13.37	50.07	10:27
2	TOC	9.2184	92.1839	73.80	87.29	13.49	50.14	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.1608 ppm (PASS)	0.0000 ppm	0%	2020/07/27 16:44

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.1608	251.6084	186.39	199.97	13.58	50.13	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/07/27 16:59

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.80	19.12	13.32	50.15	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K2005927-006	0.7255 ppm	0.0196 ppm	2.7000%	2020/07/27 17:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7117	7.1170	14.13	27.65	13.52	50.12	10:27
2	TOC	0.7394	7.3935	14.32	27.75	13.42	50.21	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	11	TOC	K2005927-001DUP	0.5892 ppm	0.0211 ppm	3.5800%	2020/07/27 17:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6041	6.0407	13.37	26.94	13.57	50.13	10:25
2	TOC	0.5743	5.7427	13.16	26.71	13.54	50.15	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K2005927-001MS	26.6277 ppm	0.1238 ppm	0.4600%	2020/07/27 18:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.7152	267.1519	196.54	209.82	13.28	50.30	10:28
2	TOC	26.5401	265.4013	195.31	208.86	13.55	50.23	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K2006089-001	3.0477 ppm	0.0920 ppm	3.0200%	2020/07/27 18:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9826	29.8260	30.06	43.47	13.41	50.32	10:29
2	TOC	3.1128	31.1275	30.97	44.32	13.35	50.27	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K2006089-002	19.4941 ppm	0.2502 ppm	1.2800%	2020/07/27 19:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	19.6710	196.7097	147.12	160.70	13.57	50.30	10:27

2	TOC	19.3171	193.1714	144.64	158.14	13.50	50.44	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	15	TOC	K2006138-001	4.1996 ppm	0.0435 ppm	1.0400%	2020/07/27 19:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2304	42.3039	38.81	52.37	13.56	50.43	10:30
2	TOC	4.1688	41.6880	38.38	51.79	13.41	50.47	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	16	TOC	K2006138-003	2.9132 ppm	0.0337 ppm	1.1600%	2020/07/27 20:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9370	29.3698	29.74	43.26	13.53	50.33	10:30
2	TOC	2.8894	28.8937	29.40	42.91	13.50	50.45	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	17	TOC	K2005902-006	0.0000 ppm	0.0000 ppm	0.0000%	2020/07/27 20:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.17	19.73	13.56	50.39	10:28
2	TOC	0.0000	0.0000	6.08	19.54	13.46	50.38	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	18	TOC	K2005902-007	0.0000 ppm	0.0000 ppm	0.0000%	2020/07/27 20:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.51	19.00	13.49	50.34	10:26
2	TOC	0.0000	0.0000	5.64	19.12	13.48	50.29	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

◆ 19	TOC	K2005902-008	0.0000 ppm	0.0000 ppm	0.0000%	2020/07/27 21:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.55	19.17	13.62	50.38	10:27
2	TOC	0.0000	0.0000	5.68	19.26	13.57	50.38	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.9928 ppm (PASS)	0.0000 ppm	0%	2020/07/27 21:54

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9928	249.9277	185.21	198.83	13.62	50.30	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/07/27 22:09

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.14	18.67	13.52	50.34	10:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample — From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2020/07/27 22:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.73	18.42	13.69	50.23	10:32

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> LCS

From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	26.6428 ppm (PASS)	0.0000 ppm	0%	2020/07/27 22:38

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	26.6428	266.4285	196.79	210.54	13.75	50.28	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	25 ppmC

Sample Type: Sample

From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	21	TOC	K2006282-001	3.1004 ppm	0.0980 ppm	3.1600%	2020/07/27 22:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.1696	31.6963	31.37	44.95	13.58	50.32	10:29
2	TOC	3.0311	30.3107	30.40	44.08	13.68	50.25	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	22	TOC	K2006282-001DUP	3.0324 ppm	0.0126 ppm	0.4200%	2020/07/27 23:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.0413	30.4133	30.47	43.97	13.50	50.35	10:27
2	TOC	3.0235	30.2351	30.34	43.90	13.56	50.26	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	23	TOC	K2006282-001MS	29.4794 ppm	0.1628 ppm	0.5500%	2020/07/27 23:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.5945	295.9452	216.74	230.25	13.51	50.32	10:30
2	TOC	29.3643	293.6429	215.12	228.86	13.73	50.25	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	24	TOC	K2005937-001	0.0000 ppm	0.0000 ppm	0.0000%	2020/07/28 00:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.63	19.17	13.53	50.31	10:28
2	TOC	0.0000	0.0000	4.73	18.33	13.60	50.20	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	25	TOC	K2005937-002	8.4452 ppm	0.4793 ppm	5.6800%	2020/07/28 00:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.7842	87.8417	70.76	84.26	13.50	50.31	10:25
2	TOC	8.1063	81.0632	66.00	79.56	13.56	50.20	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	26	TOC	K2005937-003	13.7052 ppm	0.8201 ppm	5.9800%	2020/07/28 01:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.2851	142.8509	109.34	123.03	13.69	50.33	10:29
2	TOC	13.1253	131.2526	101.21	114.77	13.57	50.21	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	27	TOC	K2005937-004	11.6252 ppm	0.3333 ppm	2.8700%	2020/07/28 01:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.8608	118.6079	92.34	106.05	13.71	50.33	10:24
2	TOC	11.3895	113.8951	89.03	102.55	13.52	50.22	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	28	TOC	K2005937-005	3.4269 ppm	0.1499 ppm	4.3700%	2020/07/28 02:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.5329	35.3286	33.92	47.52	13.60	50.33	10:27
2	TOC	3.3209	33.2088	32.43	46.04	13.61	50.24	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.9111 ppm (PASS)	0.0000 ppm	0%	2020/07/28 02:37

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9111	249.1109	184.64	198.28	13.64	50.12	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/07/28 02:52

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	4.90	18.22	13.31	50.25	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample — From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	29	TOC	K2005937-006	9.0427 ppm	0.4352 ppm	4.8100%	2020/07/28 03:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.3504	93.5040	74.73	88.37	13.65	50.15	10:29
2	TOC	8.7350	87.3499	70.41	83.98	13.57	50.31	10:30

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	30	TOC	K2005937-007	10.5940 ppm	0.3617 ppm	3.4100%	2020/07/28 03:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.8498	108.4979	85.24	98.76	13.52	50.20	10:27
2	TOC	10.3383	103.3831	81.66	95.40	13.74	50.10	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	K2005937-008	5.1630 ppm	0.1649 ppm	3.1900%	2020/07/28 04:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.2796	52.7959	46.17	59.62	13.45	50.28	10:28
2	TOC	5.0464	50.4637	44.54	58.12	13.58	50.16	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	32	TOC	K2005937-009	9.6359 ppm	0.5293 ppm	5.4900%	2020/07/28 04:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.0101	100.1014	79.35	93.03	13.67	50.23	10:28
2	TOC	9.2616	92.6159	74.10	87.96	13.86	50.22	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	K2005937-010	9.5792 ppm	0.4863 ppm	5.0800%	2020/07/28 04:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.9230	99.2304	78.74	92.38	13.63	50.11	10:28
2	TOC	9.2354	92.3536	73.92	87.66	13.74	50.27	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	K2005937-011	3.6452 ppm	0.1228 ppm	3.3700%	2020/07/28 05:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.7320	37.3201	35.32	48.75	13.44	50.19	10:27
2	TOC	3.5584	35.5838	34.10	47.70	13.60	50.12	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	35	TOC	K2005937-012	8.6162 ppm	0.5615 ppm	6.5200%	2020/07/28 05:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.0133	90.1325	72.36	85.83	13.46	50.05	10:30
2	TOC	8.2192	82.1922	66.79	80.34	13.54	50.23	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	36	TOC	K2006138-002	4.2049 ppm	0.0479 ppm	1.1400%	2020/07/28 06:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.1711	41.7108	38.39	51.94	13.54	50.12	10:28
2	TOC	4.2388	42.3880	38.87	52.31	13.44	50.08	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	37	TOC	K2006138-002D	4.2545 ppm	0.0569 ppm	1.3400%	2020/07/28 06:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2947	42.9468	39.26	52.71	13.45	50.24	10:31
2	TOC	4.2143	42.1428	38.70	52.45	13.75	50.13	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	38	TOC	K2006138-002MS	30.7927 ppm	0.1244 ppm	0.4000%	2020/07/28 07:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	30.8807	308.8065	225.76	239.40	13.64	50.08	10:28
2	TOC	30.7047	307.0474	224.52	238.06	13.53	50.20	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC)	CAS_salt_010711	CAS_salt_010711

(v1419) (v4) (v38)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.6960 ppm (PASS)	0.0000 ppm	0%	2020/07/28 07:47

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6960	246.9597	183.13	196.80	13.67	50.09	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/07/28 08:02

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.03	18.33	13.29	50.24	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample — From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	1	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2020/07/28 08:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.21	17.70	13.49	50.14	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> LCS — From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	26.5984 ppm (PASS)	0.0000 ppm	0%	2020/07/28 08:31

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	26.5984	265.9837	196.48	209.86	13.38	50.18	10:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	25 ppmC

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	40	TOC	K2006138-004	2.7779 ppm	0.0941 ppm	3.3900%	2020/07/28 08:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8445	28.4446	29.09	42.53	13.44	50.22	10:31
2	TOC	2.7113	27.1132	28.16	41.60	13.45	50.19	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.0351 ppm (PASS)	0.0000 ppm	0%	2020/07/28 09:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.0351	250.3511	185.51	198.80	13.29	50.31	10:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/07/28 09:28

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time

D	TOC	0 ppm	1	0.0000	0.0000	5.38	18.58	13.20	50.15	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	2	TOC		4.0751 ppm	0.0000 ppm	0.0000%	2020/07/28 09:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.0751	40.7514	37.72	51.27	13.55	50.22	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1356 (IC) (v1419)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1418	2.0583	0.4120	0.0000	0.0000	0.0000	2020/07/24 10:22	Fusion1 (Fusion1)
v1419	1.1637	-0.0240	0.0000	0.0000	0.0000	2020/07/27 12:13	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version:	v38	Calibration curve formula:	TOC: y = 7.015x + 9.892
Ver Creation:	2020/06/13 16:40	r^2 value:	TOC: r^2 = 0.99974
Comment:			
Operator:	Fusion1 (Fusion1)		
Basic Analysis Type	TOC		

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	9.5750	0.0000		2020/06/13 15:13
0.500 ppm	12.9010	0.5000		2020/06/13 15:28
1.0 ppm	15.6320	1.0000		2020/06/13 15:42
5.0 ppm	43.2510	5.0000		2020/06/13 15:56

10 ppm	82.4040	10.0000		2020/06/13 16:11
25 ppm	188.6880	25.0000		2020/06/13 16:25
50 ppm	358.6500	50.0000		2020/06/13 16:39

Methods

Name: CAS_salt_010711 (TOC)

Version: v4 Operator: Fusion1 (Fusion1)
Ver Creation: 2019/02/21 17:57
Comment:

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2020/07/28 09:58

ALS Environmental

StarLIMS Run: 688594/688595/688596

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 19-GEN-8-15-C 50 ppm LCS: 19-GEN-8-25J 25.0 ppm

ICAL Date: 6/16/2020

ICAL ID: 19-GEN-8-22-G

ICS ID: 19-GEN-8-4-G

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 19-GEN-8-15-B 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 19-GEN-08-31J

21 % H3PO4: 19-GEN-08-25A

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

Analyzed By:	MK	Date Analyzed:	7/27/20
Reviewed By:		Date Reviewed:	7/29/20

10515 Research Drive
Knoxville, TN 37932
Phone: (865) 573-8188
Fax: (865) 573-8133

Client: Susan Huang
APTIM
4005 Port Chicago Hwy
Concord, CA 94520

Phone: 925-288-2099

Fax:

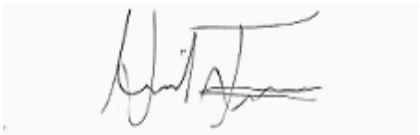
Identifier: 007RJ **Date Rec:** 10/02/2020 **Report Date:** 10/07/2020

Client Project #: 501032 **Client Project Name:** LHAAP 50 October 2020

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 50 October 2020

MI Project Number: **007RJ**
Date Received: 10/02/2020

Sample Information

Client Sample ID:		**50WW14-20100 1**	**50WW13-20100 1**	**50WW11-20100 1**	**50WW06-20100 1**	**50WW12-20100 1**
Sample Date:		10/01/2020	10/01/2020	10/01/2020	10/01/2020	10/01/2020
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		HT/HT	HT/HT	HT/HT	HT/HT	HT/HT
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**2.10E+00**	**3.80E+00**	**4.00E+00**	**2.00E-01 (J)**	**1.40E+00**

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 **10/2/2020**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	10/02/2020	10/07/2020	0 °C	104%	non-detect	non-detect

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

October 16, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS20100074**

Laboratory Results for: **LHAAP50 October 2020**

Dear Susan Huang,

ALS Environmental received 6 sample(s) on Oct 02, 2020 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: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
Work Order: HS20100074

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20100074-01	50WW14-201001	Groundwater		01-Oct-2020 07:55	02-Oct-2020 09:40	☐
HS20100074-02	50WW13-201001	Groundwater		01-Oct-2020 09:05	02-Oct-2020 09:40	☐
HS20100074-03	50WW11-201001	Groundwater		01-Oct-2020 09:55	02-Oct-2020 09:40	☐
HS20100074-04	50WW11-201001-FD	Groundwater		01-Oct-2020 09:55	02-Oct-2020 09:40	☐
HS20100074-05	50WW06-201001	Groundwater		01-Oct-2020 10:50	02-Oct-2020 09:40	☐
HS20100074-06	50WW12-201001	Groundwater		01-Oct-2020 11:40	02-Oct-2020 09:40	☐

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP50 October 2020
Work Order: HS20100074

Work Order Comments

- The analysis for Methane, Methene, Ethane and CO2 by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.
- The analysis for Perchlorate was subcontracted to our ALS Houston TX, High Resolution Lab. Final report attached.

Work Order Comments

- The analysis for TOC was subcontracted to our ALS Environmental in Kelso, WA. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R370035

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Batch ID: R369947

Sample ID: 50WW14-201001 (HS20100074-01MS)

- MS/MSD recovered outside control limits for Trichloroethene

WetChemistry by Method SW9056

Batch ID: R369813

Sample ID: 50WW12-201001 (HS20100074-06)

- Sample ran at 2x due to high concentration of sulfate.

Sample ID: 50WW14-201001 (HS20100074-01MS)

- 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,Sulfate)

Sample ID: HS20100055-04MS

- MS and MSD are for an unrelated sample (Chloride,Sulfate)

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
Sample ID: 50WW14-201001
Collection Date: 01-Oct-2020 07:55

ANALYTICAL REPORT
WorkOrder:HS20100074
Lab ID:HS20100074-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Oct-2020 15:49
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Oct-2020 15:49
cis-1,2-Dichloroethene	**2.9**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 15:49
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Oct-2020 15:49
Trichloroethene	**74**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 15:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	06-Oct-2020 15:49
Surr: 1,2-Dichloroethane-d4	*92.3*			**0**	*81-118*	*%REC*	*1*	*06-Oct-2020 15:49*
Surr: 4-Bromofluorobenzene	*107*			**0**	*85-114*	*%REC*	*1*	*06-Oct-2020 15:49*
Surr: Dibromofluoromethane	*94.8*			**0**	*80-119*	*%REC*	*1*	*06-Oct-2020 15:49*
Surr: Toluene-d8	*98.2*			**0**	*89-112*	*%REC*	*1*	*06-Oct-2020 15:49*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Chloride	**393**		**4.00**	**10.0**	**10.0**	**mg/L**	20	02-Oct-2020 20:40
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	02-Oct-2020 17:39
Sulfate	**375**		**4.00**	**10.0**	**10.0**	**mg/L**	20	02-Oct-2020 20:40
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 14:14
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	08-Oct-2020 17:46
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 18:49

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

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
Sample ID: 50WW13-201001
Collection Date: 01-Oct-2020 09:05

ANALYTICAL REPORT
WorkOrder:HS20100074
Lab ID:HS20100074-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**17**		**1.0**	**2.5**	**5.0**	**UG/L**	5	06-Oct-2020 22:38
1,2-Dichloroethane	**47**		**1.0**	**2.5**	**5.0**	**UG/L**	5	06-Oct-2020 22:38
cis-1,2-Dichloroethene	**300**		**1.0**	**2.5**	**5.0**	**UG/L**	5	06-Oct-2020 22:38
Tetrachloroethene	**8.6**		**1.5**	**2.5**	**5.0**	**UG/L**	5	06-Oct-2020 22:38
Trichloroethene	**8,300**		**10**	**25**	**50**	**UG/L**	50	06-Oct-2020 23:02
Vinyl chloride	**3.3**	J	**1.0**	**2.5**	**5.0**	**UG/L**	5	06-Oct-2020 22:38
Surr: 1,2-Dichloroethane-d4	*93.4*			**0**	*81-118*	*%REC*	*5*	*06-Oct-2020 22:38*
Surr: 1,2-Dichloroethane-d4	*90.0*			**0**	*81-118*	*%REC*	*50*	*06-Oct-2020 23:02*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*5*	*06-Oct-2020 22:38*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*50*	*06-Oct-2020 23:02*
Surr: Dibromofluoromethane	*93.4*			**0**	*80-119*	*%REC*	*50*	*06-Oct-2020 23:02*
Surr: Dibromofluoromethane	*95.7*			**0**	*80-119*	*%REC*	*5*	*06-Oct-2020 22:38*
Surr: Toluene-d8	*96.8*			**0**	*89-112*	*%REC*	*5*	*06-Oct-2020 22:38*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*50*	*06-Oct-2020 23:02*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Chloride	**316**		**4.00**	**10.0**	**10.0**	**mg/L**	20	02-Oct-2020 20:58
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	02-Oct-2020 17:57
Sulfate	**356**		**4.00**	**10.0**	**10.0**	**mg/L**	20	02-Oct-2020 20:58
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 14:14
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	08-Oct-2020 17:46
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 18:49

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

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP50 October 2020 WorkOrder:HS20100074
Sample ID: 50WW11-201001 Lab ID:HS20100074-03
Collection Date: 01-Oct-2020 09:55 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**35**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 16:13
1,2-Dichloroethane	**26**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 16:13
cis-1,2-Dichloroethene	**74**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 16:13
Tetrachloroethene	**6.8**		**0.30**	**1.0**	**1.0**	**UG/L**	1	06-Oct-2020 16:13
Trichloroethene	**3,300**		**10**	**25**	**50**	**UG/L**	50	06-Oct-2020 17:49
Vinyl chloride	**3.4**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 16:13
Surr: 1,2-Dichloroethane-d4	*91.5*			**0**	*81-118*	*%REC*	*1*	*06-Oct-2020 16:13*
Surr: 1,2-Dichloroethane-d4	*91.5*			**0**	*81-118*	*%REC*	*50*	*06-Oct-2020 17:49*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*50*	*06-Oct-2020 17:49*
Surr: 4-Bromofluorobenzene	*108*			**0**	*85-114*	*%REC*	*1*	*06-Oct-2020 16:13*
Surr: Dibromofluoromethane	*95.4*			**0**	*80-119*	*%REC*	*50*	*06-Oct-2020 17:49*
Surr: Dibromofluoromethane	*95.3*			**0**	*80-119*	*%REC*	*1*	*06-Oct-2020 16:13*
Surr: Toluene-d8	*96.7*			**0**	*89-112*	*%REC*	*1*	*06-Oct-2020 16:13*
Surr: Toluene-d8	*98.7*			**0**	*89-112*	*%REC*	*50*	*06-Oct-2020 17:49*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Chloride	**305**		**4.00**	**10.0**	**10.0**	**mg/L**	20	02-Oct-2020 21:16
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	02-Oct-2020 18:15
Sulfate	**475**		**4.00**	**10.0**	**10.0**	**mg/L**	20	02-Oct-2020 21:16
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 14:14
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	08-Oct-2020 17:46
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 18:49

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

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP50 October 2020
Sample ID: 50WW11-201001-FD
Collection Date: 01-Oct-2020 09:55

ANALYTICAL REPORT
WorkOrder:HS20100074
Lab ID:HS20100074-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**34**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 16:37
1,2-Dichloroethane	**25**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 16:37
cis-1,2-Dichloroethene	**74**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 16:37
Tetrachloroethene	**7.1**		**0.30**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 16:37
Trichloroethene	**3,500**		**10**	**25**	**50**	**UG/L**	50	06-Oct-2020 18:13
Vinyl chloride	**3.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 16:37
Surr: 1,2-Dichloroethane-d4	*90.7*			**0**	*81-118*	*%REC*	*1*	*06-Oct-2020 16:37*
Surr: 1,2-Dichloroethane-d4	*92.4*			**0**	*81-118*	*%REC*	*50*	*06-Oct-2020 18:13*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*1*	*06-Oct-2020 16:37*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*50*	*06-Oct-2020 18:13*
Surr: Dibromofluoromethane	*94.0*			**0**	*80-119*	*%REC*	*50*	*06-Oct-2020 18:13*
Surr: Dibromofluoromethane	*93.3*			**0**	*80-119*	*%REC*	*1*	*06-Oct-2020 16:37*
Surr: Toluene-d8	*98.6*			**0**	*89-112*	*%REC*	*50*	*06-Oct-2020 18:13*
Surr: Toluene-d8	*95.5*			**0**	*89-112*	*%REC*	*1*	*06-Oct-2020 16:37*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Chloride	**301**		**4.00**	**10.0**	**10.0**	**mg/L**	20	02-Oct-2020 21:34
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	02-Oct-2020 19:09
Sulfate	**403**		**4.00**	**10.0**	**10.0**	**mg/L**	20	02-Oct-2020 21:34
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 14:14
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	08-Oct-2020 17:46
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 18:49

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

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
Sample ID: 50WW06-201001
Collection Date: 01-Oct-2020 10:50

ANALYTICAL REPORT
WorkOrder:HS20100074
Lab ID:HS20100074-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Oct-2020 21:50
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Oct-2020 21:50
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Oct-2020 21:50
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Oct-2020 21:50
Trichloroethene	**14**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 21:50
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	06-Oct-2020 21:50
Surr: 1,2-Dichloroethane-d4	*90.0*			**0**	*81-118*	*%REC*	*1*	*06-Oct-2020 21:50*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*06-Oct-2020 21:50*
Surr: Dibromofluoromethane	*93.8*			**0**	*80-119*	*%REC*	*1*	*06-Oct-2020 21:50*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*06-Oct-2020 21:50*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Chloride	**41.8**		**0.200**	**0.500**	**0.500**	**mg/L**	1	02-Oct-2020 19:28
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	02-Oct-2020 19:28
Sulfate	**17.9**		**0.200**	**0.500**	**0.500**	**mg/L**	1	02-Oct-2020 19:28
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 14:14
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	08-Oct-2020 17:46
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 18:49

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

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastructure, Inc. **ANALYTICAL REPORT**
Project: LHAAP50 October 2020 WorkOrder:HS20100074
Sample ID: 50WW12-201001 Lab ID:HS20100074-06
Collection Date: 01-Oct-2020 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-Dichloroethene	**5.2**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 22:14
1,2-Dichloroethane	**3.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 22:14
cis-1,2-Dichloroethene	**0.87**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 22:14
Tetrachloroethene	1.0	U	0.30	1.0	1.0	UG/L	1	06-Oct-2020 22:14
Trichloroethene	**380**		**2.0**	**5.0**	**10**	**UG/L**	10	07-Oct-2020 19:36
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	06-Oct-2020 22:14
Surr: 1,2-Dichloroethane-d4	*90.4*			**0**	*81-118*	*%REC*	*1*	*06-Oct-2020 22:14*
Surr: 1,2-Dichloroethane-d4	*90.6*			**0**	*81-118*	*%REC*	*10*	*07-Oct-2020 19:36*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*1*	*06-Oct-2020 22:14*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*10*	*07-Oct-2020 19:36*
Surr: Dibromofluoromethane	*93.5*			**0**	*80-119*	*%REC*	*1*	*06-Oct-2020 22:14*
Surr: Dibromofluoromethane	*92.9*			**0**	*80-119*	*%REC*	*10*	*07-Oct-2020 19:36*
Surr: Toluene-d8	*99.4*			**0**	*89-112*	*%REC*	*1*	*06-Oct-2020 22:14*
Surr: Toluene-d8	*98.3*			**0**	*89-112*	*%REC*	*10*	*07-Oct-2020 19:36*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Chloride	**1,080**		**20.0**	**50.0**	**50.0**	**mg/L**	100	02-Oct-2020 21:52
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	02-Oct-2020 19:46
Sulfate	**595**		**20.0**	**50.0**	**50.0**	**mg/L**	100	02-Oct-2020 21:52
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 14:14
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	08-Oct-2020 17:46
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 18:49

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

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: HS20100074

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R369813 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20100074-01	50WW14-201001	01 Oct 2020 07:55			02 Oct 2020 20:40	20
HS20100074-01	50WW14-201001	01 Oct 2020 07:55			02 Oct 2020 17:39	1
HS20100074-02	50WW13-201001	01 Oct 2020 09:05			02 Oct 2020 20:58	20
HS20100074-02	50WW13-201001	01 Oct 2020 09:05			02 Oct 2020 17:57	1
HS20100074-03	50WW11-201001	01 Oct 2020 09:55			02 Oct 2020 21:16	20
HS20100074-03	50WW11-201001	01 Oct 2020 09:55			02 Oct 2020 18:15	1
HS20100074-04	50WW11-201001-FD	01 Oct 2020 09:55			02 Oct 2020 21:34	20
HS20100074-04	50WW11-201001-FD	01 Oct 2020 09:55			02 Oct 2020 19:09	1
HS20100074-05	50WW06-201001	01 Oct 2020 10:50			02 Oct 2020 19:28	1
HS20100074-06	50WW12-201001	01 Oct 2020 11:40			02 Oct 2020 21:52	100
HS20100074-06	50WW12-201001	01 Oct 2020 11:40			02 Oct 2020 19:46	2
Batch ID: R369947 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20100074-01	50WW14-201001	01 Oct 2020 07:55			06 Oct 2020 15:49	1
HS20100074-02	50WW13-201001	01 Oct 2020 09:05			06 Oct 2020 23:02	50
HS20100074-02	50WW13-201001	01 Oct 2020 09:05			06 Oct 2020 22:38	5
HS20100074-03	50WW11-201001	01 Oct 2020 09:55			06 Oct 2020 17:49	50
HS20100074-03	50WW11-201001	01 Oct 2020 09:55			06 Oct 2020 16:13	1
HS20100074-04	50WW11-201001-FD	01 Oct 2020 09:55			06 Oct 2020 18:13	50
HS20100074-04	50WW11-201001-FD	01 Oct 2020 09:55			06 Oct 2020 16:37	1
HS20100074-05	50WW06-201001	01 Oct 2020 10:50			06 Oct 2020 21:50	1
HS20100074-06	50WW12-201001	01 Oct 2020 11:40			06 Oct 2020 22:14	1
Batch ID: R370035 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20100074-06	50WW12-201001	01 Oct 2020 11:40			07 Oct 2020 19:36	10
Batch ID: R370096 (0)	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Groundwater	
HS20100074-01	50WW14-201001	01 Oct 2020 07:55			08 Oct 2020 17:46	1
HS20100074-02	50WW13-201001	01 Oct 2020 09:05			08 Oct 2020 17:46	1
HS20100074-03	50WW11-201001	01 Oct 2020 09:55			08 Oct 2020 17:46	1
HS20100074-04	50WW11-201001-FD	01 Oct 2020 09:55			08 Oct 2020 17:46	1
HS20100074-05	50WW06-201001	01 Oct 2020 10:50			08 Oct 2020 17:46	1
HS20100074-06	50WW12-201001	01 Oct 2020 11:40			08 Oct 2020 17:46	1
Batch ID: R370673 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS20100074-01	50WW14-201001	01 Oct 2020 07:55			16 Oct 2020 14:14	1
HS20100074-02	50WW13-201001	01 Oct 2020 09:05			16 Oct 2020 14:14	1
HS20100074-03	50WW11-201001	01 Oct 2020 09:55			16 Oct 2020 14:14	1
HS20100074-04	50WW11-201001-FD	01 Oct 2020 09:55			16 Oct 2020 14:14	1
HS20100074-05	50WW06-201001	01 Oct 2020 10:50			16 Oct 2020 14:14	1
HS20100074-06	50WW12-201001	01 Oct 2020 11:40			16 Oct 2020 14:14	1

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: HS20100074

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R370713 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS20100074-01	50WW14-201001	01 Oct 2020 07:55			16 Oct 2020 18:49	1
HS20100074-02	50WW13-201001	01 Oct 2020 09:05			16 Oct 2020 18:49	1
HS20100074-03	50WW11-201001	01 Oct 2020 09:55			16 Oct 2020 18:49	1
HS20100074-04	50WW11-201001-FD	01 Oct 2020 09:55			16 Oct 2020 18:49	1
HS20100074-05	50WW06-201001	01 Oct 2020 10:50			16 Oct 2020 18:49	1
HS20100074-06	50WW12-201001	01 Oct 2020 11:40			16 Oct 2020 18:49	1

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: HS20100074

QC BATCH REPORT

Batch ID: R369947 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200106** Units: **UG/L** Analysis Date: **06-Oct-2020 13:49**
Client ID: Run ID: **VOA6_369947** SeqNo: **5768399** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
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
Tetrachloroethene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*45.31*	*1.0*	*50*	*0*	*90.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.5*	*1.0*	*50*	*0*	*107*	*85 - 114*				
Surr: Dibromofluoromethane	*46.64*	*1.0*	*50*	*0*	*93.3*	*80 - 119*				
Surr: Toluene-d8	*50.28*	*1.0*	*50*	*0*	*101*	*89 - 112*				

LCS Sample ID: **VLCSW-200106** Units: **UG/L** Analysis Date: **06-Oct-2020 13:01**
Client ID: Run ID: **VOA6_369947** SeqNo: **5768398** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	19.01	1.0	20	0	95.1	71 - 131				
1,2-Dichloroethane	19.01	1.0	20	0	95.1	73 - 128				
cis-1,2-Dichloroethene	19.21	1.0	20	0	96.1	78 - 123				
Tetrachloroethene	18.39	1.0	20	0	92.0	74 - 129				
Trichloroethene	18.66	1.0	20	0	93.3	79 - 123				
Vinyl chloride	18.61	1.0	20	0	93.0	58 - 137				
Surr: 1,2-Dichloroethane-d4	*47.78*	*1.0*	*50*	*0*	*95.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.27*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*48.22*	*1.0*	*50*	*0*	*96.4*	*80 - 119*				
Surr: Toluene-d8	*47.82*	*1.0*	*50*	*0*	*95.6*	*89 - 112*				

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: HS20100074

QC BATCH REPORT

Batch ID: R369947 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20100074-01MS** Units: **UG/L** Analysis Date: **06-Oct-2020 17:01**
Client ID: **50WW14-201001** Run ID: **VOA6_369947** SeqNo: **5768407** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	25.89	1.0	20	0	129	71 - 131				
1,2-Dichloroethane	23.12	1.0	20	0	116	73 - 128				
cis-1,2-Dichloroethene	27.05	1.0	20	2.931	121	78 - 123				
Tetrachloroethene	24.03	1.0	20	0	120	74 - 129				
Trichloroethene	104.5	1.0	20	73.92	153	79 - 123				S
Vinyl chloride	24.72	1.0	20	0	124	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.97*	*1.0*	*50*	*0*	*91.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.03*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*47.64*	*1.0*	*50*	*0*	*95.3*	*80 - 119*				
Surr: Toluene-d8	*48.79*	*1.0*	*50*	*0*	*97.6*	*89 - 112*				

MSD Sample ID: **HS20100074-01MSD** Units: **UG/L** Analysis Date: **06-Oct-2020 17:25**
Client ID: **50WW14-201001** Run ID: **VOA6_369947** SeqNo: **5768408** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	25.17	1.0	20	0	126	71 - 131	25.89	2.84	20	
1,2-Dichloroethane	23.28	1.0	20	0	116	73 - 128	23.12	0.717	20	
cis-1,2-Dichloroethene	26.48	1.0	20	2.931	118	78 - 123	27.05	2.13	20	
Tetrachloroethene	23.65	1.0	20	0	118	74 - 129	24.03	1.59	20	
Trichloroethene	99.73	1.0	20	73.92	129	79 - 123	104.5	4.68	20	S
Vinyl chloride	23.67	1.0	20	0	118	58 - 137	24.72	4.33	20	
Surr: 1,2-Dichloroethane-d4	*45.61*	*1.0*	*50*	*0*	*91.2*	*81 - 118*	*45.97*	*0.788*	*20*	
Surr: 4-Bromofluorobenzene	*51.76*	*1.0*	*50*	*0*	*104*	*85 - 114*	*52.03*	*0.521*	*20*	
Surr: Dibromofluoromethane	*47.21*	*1.0*	*50*	*0*	*94.4*	*80 - 119*	*47.64*	*0.918*	*20*	
Surr: Toluene-d8	*48.84*	*1.0*	*50*	*0*	*97.7*	*89 - 112*	*48.79*	*0.118*	*20*	

The following samples were analyzed in this batch: HS20100074-01 HS20100074-02 HS20100074-03 HS20100074-04 HS20100074-05 HS20100074-06

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: HS20100074

QC BATCH REPORT

Batch ID: R370035 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200107** Units: **UG/L** Analysis Date: **07-Oct-2020 13:11**
Client ID: Run ID: **VOA6_370035** SeqNo: **5770429** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*45.98*	*1.0*	*50*	*0*	*92.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*54.08*	*1.0*	*50*	*0*	*108*	*85 - 114*				
Surr: Dibromofluoromethane	*47.27*	*1.0*	*50*	*0*	*94.5*	*80 - 119*				
Surr: Toluene-d8	*49.55*	*1.0*	*50*	*0*	*99.1*	*89 - 112*				

LCS Sample ID: **VLCSW-200107** Units: **UG/L** Analysis Date: **07-Oct-2020 12:23**
Client ID: Run ID: **VOA6_370035** SeqNo: **5770428** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	20.43	1.0	20	0	102	79 - 123				
Surr: 1,2-Dichloroethane-d4	*49.67*	*1.0*	*50*	*0*	*99.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.06*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*49.6*	*1.0*	*50*	*0*	*99.2*	*80 - 119*				
Surr: Toluene-d8	*49.83*	*1.0*	*50*	*0*	*99.7*	*89 - 112*				

MS Sample ID: **HS20100133-06MS** Units: **UG/L** Analysis Date: **07-Oct-2020 18:48**
Client ID: Run ID: **VOA6_370035** SeqNo: **5770443** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	23.85	1.0	20	0	119	79 - 123				
Surr: 1,2-Dichloroethane-d4	*48.18*	*1.0*	*50*	*0*	*96.4*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.59*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*48.55*	*1.0*	*50*	*0*	*97.1*	*80 - 119*				
Surr: Toluene-d8	*48.26*	*1.0*	*50*	*0*	*96.5*	*89 - 112*				

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: HS20100074

QC BATCH REPORT

Batch ID: R370035 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS20100133-06MSD** Units: **UG/L** Analysis Date: **07-Oct-2020 19:12**
Client ID: Run ID: **VOA6_370035** SeqNo: **5770444** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	23.73	1.0	20	0	119	79 - 123	23.85	0.499	20	
Surr: 1,2-Dichloroethane-d4	*46.7*	*1.0*	*50*	*0*	*93.4*	*81 - 118*	*48.18*	*3.11*	*20*	
Surr: 4-Bromofluorobenzene	*52.31*	*1.0*	*50*	*0*	*105*	*85 - 114*	*52.59*	*0.538*	*20*	
Surr: Dibromofluoromethane	*47.02*	*1.0*	*50*	*0*	*94.0*	*80 - 119*	*48.55*	*3.2*	*20*	
Surr: Toluene-d8	*48.59*	*1.0*	*50*	*0*	*97.2*	*89 - 112*	*48.26*	*0.683*	*20*	

The following samples were analyzed in this batch: HS20100074-06

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: HS20100074

QC BATCH REPORT

Batch ID: R369813 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-100220** Units: **mg/L** Analysis Date: **02-Oct-2020 10:44**
Client ID: Run ID: **ICS-Integrion_369813** SeqNo: **5765380** 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
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-100220** Units: **mg/L** Analysis Date: **02-Oct-2020 11:02**
Client ID: Run ID: **ICS-Integrion_369813** SeqNo: **5765381** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.51	0.500	20	0	97.6	80 - 120				
Nitrogen, Nitrate (As N)	3.953	0.100	4	0	98.8	80 - 120				
Sulfate	18.84	0.500	20	0	94.2	80 - 120				

MS Sample ID: **HS20100074-01MS** Units: **mg/L** Analysis Date: **02-Oct-2020 20:04**
Client ID: **50WW14-201001** Run ID: **ICS-Integrion_369813** SeqNo: **5765398** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	392.3	0.500	10	388.6	37.6	80 - 120				SEO
Nitrogen, Nitrate (As N)	2.329	0.100	2	0	116	80 - 120				
Sulfate	371.1	0.500	10	369.4	16.9	80 - 120				SEO

MS Sample ID: **HS20100055-04MS** Units: **mg/L** Analysis Date: **02-Oct-2020 17:03**
Client ID: Run ID: **ICS-Integrion_369813** SeqNo: **5765388** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	144.2	0.500	10	137.2	70.3	80 - 120				SEO
Nitrogen, Nitrate (As N)	7.175	0.100	2	5.31	93.3	80 - 120				
Sulfate	80.39	0.500	10	72.59	78.0	80 - 120				SO

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: HS20100074

QC BATCH REPORT

Batch ID: R369813 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS20100074-01MSD** Units: **mg/L** Analysis Date: **02-Oct-2020 20:22**
Client ID: **50WW14-201001** Run ID: **ICS-Integrion_369813** SeqNo: **5765399** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	392.2	0.500	10	388.6	35.7	80 - 120	392.3	0.0477	20	SEO
Nitrogen, Nitrate (As N)	2.185	0.100	2	0	109	80 - 120	2.329	6.39	20	
Sulfate	372	0.500	10	369.4	26.0	80 - 120	371.1	0.246	20	SEO

MSD Sample ID: **HS20100055-04MSD** Units: **mg/L** Analysis Date: **02-Oct-2020 17:21**
Client ID: Run ID: **ICS-Integrion_369813** SeqNo: **5765389** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	144.5	0.500	10	137.2	73.0	80 - 120	144.2	0.186	20	SEO
Nitrogen, Nitrate (As N)	7.107	0.100	2	5.31	89.9	80 - 120	7.175	0.952	20	
Sulfate	81.02	0.500	10	72.59	84.4	80 - 120	80.39	0.787	20	O

The following samples were analyzed in this batch: HS20100074-01 HS20100074-02 HS20100074-03 HS20100074-04 HS20100074-05 HS20100074-06

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: **HS20100074**

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: 16-Oct-20

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	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	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2020-2021	30-Apr-2021
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US Date: 16-Oct-20

Sample Receipt Checklist

Work Order ID: HS20100074 **Date/Time Received:** **02-Oct-2020 09:40**

Client Name: CBI-Houston **Received by:** **Jared R. Makan**

Completed By:	/S/ Jared R. Makan	02-Oct-2020 15:01	**Reviewed by:**	/S/ RJ Modashia	02-Oct-2020 17:04
	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):	1.3°C/1.3°C UC/C	IR31
Cooler(s)/Kit(s):	Blue	
Date/Time sample(s) sent to storage:	10/02/2020 15:00	

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:

01077970

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: **LHAAP50 October 2020**

Prepared By: Scott Beesinger

P.O. Number

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 (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW6850	Remarks (Preservatives, etc.)	Lab I.D.#
50WW14-201001	WG	10/1/20/0755		13	X	X	X	X	X	X		
50WW14-201001-MS	WG	10/1/20/0755		13	X	X	X	X	X	X		
50WW14-201001-MSD	WG	10/1/20/0755		13	X	X	X	X	X	X		
50WW13-201001	WG	10/1/20/0905		13	X	X	X	X	X	X		
50WW11-201001	WG	10/1/20/0955		13	X	X	X	X	X	X		
50WW11-201001-FD	WG	10/1/20/0955		13	X	X	X	X	X	X		
50WW06-201001	WG	10/1/20/1050		13	X	X	X	X	X	X		
50WW12-201001	WG	10/1/20/1140		13	X	X	X	X	X	X		

Additional Remarks: **Standard TAT on all parameters. Please email results to Susan.Huang@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	10/1/20	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Innaccone	10/2/20	09:40							

Remarks:
Cooler - Blue 1N31
Temp 1.3°C CF0

HS20100074

Aptim Environmental & Infrastucture, Inc.
LHAAP50 October 2020

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

BME

CUSTODY SEAL

Date: 10/1/20 Time: 1430
Name: Scott Beesinger
Company: BHMTX

Seal Broken By: SM
Date: 10/02/20

BME OCT 0 2 2020

Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 159869-434 RIT2 EXP 03/21

ALS

BME

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM
1203-B EAST GRAND AVE.
PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 21SEP20
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 28x14x14 IN

JC015/1545/3155

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-50-BO 73885-RJ

RMA:

FedEx Express

J181

FedEx.
TRK# 0221 1891 8880 4955

FRI - 02 OCT AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FID: 162785 01Oct2020 GGGA 56DG2/A27E/05A2

October 16, 2020 Service Request No:E2000944

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: HS20100074

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 05, 2020
For your reference, these analyses have been assigned our service request number **E2000944.**

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.:**	E2000944
Project:	HS20100074	**Date Received:**	10/05/20
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 IV. 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 10/05/20.

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:

EQ2000497: 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, LCSD, 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:**E2000944
Project: HS20100074

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2000944-001	50WW14-201001	10/1/2020	0750
E2000944-002	50WW13-201001	10/1/2020	0835
E2000944-003	50WW11-201001	10/1/2020	0920
E2000944-004	50WW11-201001-FD	10/1/2020	0920
E2000944-005	50WW06-201001	10/1/2020	1000
E2000944-006	50WW12-201001	10/1/2020	1045

Service Request Summary

Folder #: **E2000944**
Client Name: ALS Environmental - US
Project Name: HS20100074
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: 10/05/20
Internal Due Date: 10/16/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20080476
EDD: No EDD Specified

8 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 8D
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2000944-001	50WW14-201001	Ground Water	10/01/20 0750	**IV**
E2000944-002	50WW13-201001	Ground Water	10/01/20 0835	**IV**
E2000944-003	50WW11-201001	Ground Water	10/01/20 0920	**IV**
E2000944-004	50WW11-201001-FD	Ground Water	10/01/20 0920	**IV**
E2000944-005	50WW06-201001	Ground Water	10/01/20 1000	**IV**
E2000944-006	50WW12-201001	Ground Water	10/01/20 1045	**IV**

Service Request Summary

Folder #: **E2000944**
Client Name: ALS Environmental - US
Project Name: HS20100074
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: 10/05/20
Internal Due Date: 10/16/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20080476
EDD: No EDD Specified

8 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 8D
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	5	Level II due 10/16,level IV 10/23
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.
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.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

Data Qualifiers

Lab 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	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
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	LA028-2020	12/31/2020
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Minnesota Department of Health	1785988	12/31/2020
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
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	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022
Washington Department of Health	C819	11/14/2020

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

E2000944 5
ALS Laboratory Group
HS20080476

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **14818**

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:	HS20100074
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20100074-01**	**50WW14-201001**	**Groundwater**	**01 Oct 2020 07:55**
	SUB_Perch-6850			09 Oct 2020
2.	**HS20100074-02**	**50WW13-201001**	**Groundwater**	**01 Oct 2020 09:05**
	SUB_Perch-6850			09 Oct 2020
3.	**HS20100074-03**	**50WW11-201001**	**Groundwater**	**01 Oct 2020 09:55**
	SUB_Perch-6850			09 Oct 2020
4.	**HS20100074-04**	**50WW11-201001-FD**	**Groundwater**	**01 Oct 2020 09:55**
	SUB_Perch-6850			09 Oct 2020
5.	**HS20100074-05**	**50WW06-201001**	**Groundwater**	**01 Oct 2020 10:50**
	SUB_Perch-6850			09 Oct 2020
6.	**HS20100074-06**	**50WW12-201001**	**Groundwater**	**01 Oct 2020 11:40**
	SUB_Perch-6850			09 Oct 2020

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

HS20100074-01 MS/MSD

QC Level: DOD IV (DoD Data Package)

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **14818**

Relinquished By: _____ Date/Time: _____

Received By: CORET G Date/Time: 10/5/20 1206

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

Cooler Receipt Form

Project Chemist ch

Client/Project ALS-HH

Thermometer ID 1251

Date/Time Received: 10/15/12 0

Initials: ch

Date/Time Logged in: 10/15/12 0

Initials ch

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?
-		10/15/12	1100	ch	1.9	☒
						☐
						☐
						☐

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: E2000944 5

ALS Laboratory Group HS20080476

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#: 367345 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/KBROWN **Prep Method:** Method **Prep Date/Time:** 10/9/20 11:34

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2000943-001	50WW29-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2000943-002	50WW05-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2000944-001	50WW14-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2000944-002	50WW13-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2000944-003	50WW11-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2000944-004	50WW11-201001-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2000944-005	50WW06-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2000944-006	50WW12-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2000949-001	LH18/24-SP650_100620-AIX	.01	6850/ClO4 DOD			Water	10mL	
10	E2000949-002	LH18/24-SP650_100620-BIX	.01	6850/ClO4 DOD			Water	10mL	
11	E2000964-001	50WW09-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2000964-002	50WW08-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2000964-003	50WW22-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2000964-004	50WW23-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2000964-005	50WW15-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2000964-006	50WW16-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
17	E2000964-007	50WW18-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
18	E2000964-008	50WW1-201005-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
19	EQ2000497-01	MB		6850/ClO4 DOD			Liquid	10mL	
20	EQ2000497-02	LCS		6850/ClO4 DOD			Liquid	10mL	
21	EQ2000497-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
22	EQ2000497-04	50WW14-201001 MS	.02	6850/ClO4 DOD			Liquid	10mL	
23	EQ2000497-05	50WW14-201001 DMS	.03	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 209764 Logbook Ref: Perchlorate Int. Stock1 51820 Expires On: 11/18/2020

EQ2000497-02	1.00µL	EQ2000497-03	1.00µL	EQ2000497-04	1.00µL	EQ2000497-05	1.00µL

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 212340 Logbook Ref: Sodium Perchlorate Expires On: 07/13/2022

E2000943-001	100.00µL	E2000943-002	100.00µL	E2000944-001	100.00µL	E2000944-002	100.00µL	E2000944-003	100.00µL	E2000944-004	100.00µL
E2000944-005	100.00µL	E2000944-006	100.00µL	E2000949-001	100.00µL	E2000949-002	100.00µL	E2000964-001	100.00µL	E2000964-002	100.00µL
E2000964-003	100.00µL	E2000964-004	100.00µL	E2000964-005	100.00µL	E2000964-006	100.00µL	E2000964-007	100.00µL	E2000964-008	100.00µL
EQ2000497-01	100.00µL	EQ2000497-02	100.00µL	EQ2000497-03	100.00µL	EQ2000497-04	100.00µL	EQ2000497-05	100.00µL		

Preparation Information Benchsheet

Prep Run#: 367345
Team: Semivoa GCMS/KBROWN
Prep WorkFlow: GenExt28Day
Prep Method: Method
Status: Prepped
Prep Date/Time: 10/9/20 11:34

Preparation Steps

Step: Preparation
Started: 10/9/20 11:34
Finished: 10/9/20 13:30
By: KBROWN
Comments

Comments: _____

Reviewed By: GR Date: 10/10/2020

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:**	E2000944
Project:	HS20100074	**Date Collected:**	10/ 1/20 0750
Sample Matrix:	Ground Water	**Date Received:**	10/ 5/20
Sample Name:	50WW14-201001	**Units:**	µg/L
Lab Code:	E2000944-001	**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	**1.37**		1.00	0.500	0.250	10	10/ 9/20	10/16/20 11:14	367345	699559	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20100074	**Date Collected:**	10/ 1/20 0835
Sample Matrix:	Ground Water	**Date Received:**	10/ 5/20
Sample Name:	50WW13-201001	**Units:**	µg/L
Lab Code:	E2000944-002	**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	**4390**		20.0	10.0	5.00	200	10/ 9/20	10/16/20 11:22	367345	699559	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20100074	**Date Collected:**	10/ 1/20 0920
Sample Matrix:	Ground Water	**Date Received:**	10/ 5/20
Sample Name:	50WW11-201001	**Units:**	µg/L
Lab Code:	E2000944-003	**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	**6630**		20.0	10.0	5.00	200	10/ 9/20	10/16/20 11:30	367345	699559	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20100074	**Date Collected:**	10/ 1/20 0920
Sample Matrix:	Ground Water	**Date Received:**	10/ 5/20
Sample Name:	50WW11-201001-FD	**Units:**	µg/L
Lab Code:	E2000944-004	**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	**7940**		20.0	10.0	5.00	200	10/ 9/20	10/16/20 11:38	367345	699559	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20100074	**Date Collected:**	10/ 1/20 1000
Sample Matrix:	Ground Water	**Date Received:**	10/ 5/20
Sample Name:	50WW06-201001	**Units:**	µg/L
Lab Code:	E2000944-005	**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	**1660**		10.0	5.00	2.50	100	10/ 9/20	10/16/20 11:46	367345	699559	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20100074	**Date Collected:**	10/ 1/20 1045
Sample Matrix:	Ground Water	**Date Received:**	10/ 5/20
Sample Name:	50WW12-201001	**Units:**	µg/L
Lab Code:	E2000944-006	**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	**41600**		100	50.0	25.0	1000	10/ 9/20	10/16/20 11:54	367345	699559	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20100074	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2000497-01	**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	10/ 9/20	10/9/20 15:24	367345	698929	

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: HS20100074
Sample Matrix: Ground Water

Service Request: E2000944
Date Analyzed: 10/ 9/20

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: 367345

	Lab Control Sample EQ2000497-02			Duplicate Lab Control Sample EQ2000497-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0996	0.100	100	0.111	0.100	111	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:**	E2000944
Project:	HS20100074	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000497-02	**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	**0.0996**	J	0.100	0.0500	0.0250	1	10/ 9/20	10/9/20 15:32	367345	698929	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20100074	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000497-03	**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	**0.111**		0.100	0.0500	0.0250	1	10/ 9/20	10/9/20 15:40	367345	698929	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20100074	**Date Collected:**	10/1/20
Sample Matrix:	Ground Water	**Date Received:**	10/5/20
		Date Analyzed:	10/16/20

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	50WW14-201001	**Units:**	µg/L
Lab Code:	E2000944-001	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		50WW14-201001MS				50WW14-201001DMS					
		Matrix Spike				**Duplicate Matrix Spike**					
		EQ2000497-04				EQ2000497-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	1.37	1.46	0.100	94	1.47	0.100	101	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:**	E2000944
Project:	HS20100074	**Date Collected:**	10/ 1/20 0750
Sample Matrix:	Ground Water	**Date Received:**	10/ 5/20
Sample Name:	50WW14-201001	**Units:**	µg/L
Lab Code:	EQ2000497-04	**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	**1.46**		1.00	0.500	0.250	10	10/ 9/20	10/16/20 12:25	367345	699559	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20100074	**Date Collected:**	10/ 1/20 0750
Sample Matrix:	Ground Water	**Date Received:**	10/ 5/20
Sample Name:	50WW14-201001	**Units:**	µg/L
Lab Code:	EQ2000497-05	**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	**1.47**		1.00	0.500	0.250	10	10/ 9/20	10/16/20 12:09	367345	699559	

Initial Calibration

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20200915

1st Review: Grivera
2nd Review: Hvan

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 9/15/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000032**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	PERCHLORATE1		20200915_044	Perchlorate6850b.lcm	1x	☒	3100806-05	9/15/2020 17:55
2	PERCHLORATE2		20200915_024	Perchlorate6850b.lcm	1x	☒	3100806-06	9/15/2020 15:10
3	PERCHLORATE3		20200915_046	Perchlorate6850b.lcm	1x	☒	3100806-07	9/15/2020 18:13
4	PERCHLORATE4		20200915_047	Perchlorate6850b.lcm	1x	☒	3100807-01	9/15/2020 18:21
5	PERCHLORATE5		20200915_048	Perchlorate6850b.lcm	1x	☒	3100807-02	9/15/2020 18:29
6	PERCHLORATE6		20200915_049	Perchlorate6850b.lcm	1x	☒	3100807-03	9/15/2020 18:37
7	PERCHLORATE7		20200915_029	Perchlorate6850b.lcm	1x	☒	3100807-04	9/15/2020 15:49
8	PERCHLORATE8		20200915_051	Perchlorate6850b.lcm	1x	☒	3100807-05	9/15/2020 18:52
9	PERCHLORATE9		20200915_052	Perchlorate6850b.lcm	1x	☒	3100807-06	9/15/2020 19:00
10	PERCHLORATE10		20200915_053	Perchlorate6850b.lcm	1x	☒	3100807-07	9/15/2020 19:08
11	PERCHLORATE ICV		20200915_054	Perchlorate6850b.lcm	1x	☒	3100807-08	9/15/2020 19:16
12	LODV		20200915_055	Perchlorate6850b.lcm	1x	☒		9/15/2020 19:24
13	E2000817-001		20200915_056	Perchlorate6850b.lcm	1x	☒		9/15/2020 19:40
14	E2000817-001x10		20200915_057	Perchlorate6850b.lcm	1x	☒		9/15/2020 19:48
15	PERCHLORATE7		20200915_058	Perchlorate6850b.lcm	1x	☒	3100807-04	9/15/2020 19:56
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								

Initial Calibration - Detailed Report

Calibration ID: EC2000032 **Instrument ID:** E-LCMS-01
Column Name: 1

#	Lab Code	Sample Name	File Location	Aquisition Date
01	EC2000032-01	PERCHLORATE2	20200915_024	09/15/2020 15:10
02	EC2000032-02	PERCHLORATE7	20200915_029	09/15/2020 15:49
03	EC2000032-03	PERCHLORATE1	20200915_044	09/15/2020 17:55
04	EC2000032-04	PERCHLORATE3	20200915_046	09/15/2020 18:13
05	EC2000032-05	PERCHLORATE4	20200915_047	09/15/2020 18:21
06	EC2000032-06	PERCHLORATE5	20200915_048	09/15/2020 18:29
07	EC2000032-07	PERCHLORATE6	20200915_049	09/15/2020 18:37
08	EC2000032-08	PERCHLORATE8	20200915_051	09/15/2020 18:52
09	EC2000032-09	PERCHLORATE9	20200915_052	09/15/2020 19:00
10	EC2000032-10	PERCHLORATE10	20200915_053	09/15/2020 19:08

Analyte	Curve Fit	Weighting		
Perchlorate	**Quadratic**	**Equal**	**COD = 0.9998**	**Y= -9.474E-05 X² + 0.1066 X + 0.00148**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5000	0.1319	02	10.0000	0.1001	03	0.1000	0.1399	04	0.7000	0.1079
05	1.0000	0.1089	06	2.0000	0.1096	07	5.0000	0.1086	08	20.0000	0.1062
09	30.0000	0.104	10	50.0000	0.1018						

Analyte

Perchlorate

#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D
01	0.5000	0.605	21.0	02	10.0000	9.45	-5.5	03	0.1000	0.117	17.3
04	0.7000	0.695	-0.8	05	1.0000	1.01	0.8	06	2.0000	2.05	2.3
07	5.0000	5.10	2.0	08	20.0000	20.3	1.3	09	30.0000	30.1	0.2
10	50.0000	50.0	-0.1								

Initial Calibration Verification Summary Report

Calibration ID:	EC2000032	**Instrument ID:**	E-LCMS-01
Datafile ID:	20200915_054	**Column Name:**	1

Analyte	Lab Code	Type	Curve Fit	True Value	Calc Conc	Units	Result	Criteria
Perchlorate	EC2000032-11	T	Quadratic	10	9.462	ng/mL	-5.4	<= 15

ALS Group Houston

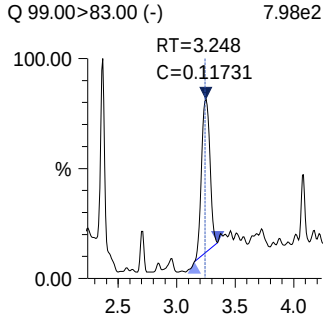
PERCHLORATE1

Date acquired: 9/15/2020 5:55:29 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_044.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE1	9/15/2020 5:55:29 PM	2833	0.11731	20200915_044	3.248	25.0000	1.0000	5
Sodium Perchlorate-18O4_IS	PERCHLORATE1	9/15/2020 5:55:29 PM	202512	1.00000	20200915_044	3.237	25.0000	1.0000	5

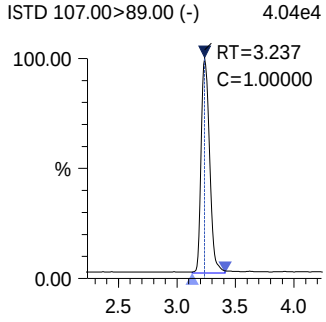
Perchlorate

Conc 0.11731
Area 2833



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 202512



ALS Group Houston

PERCHLORATE2

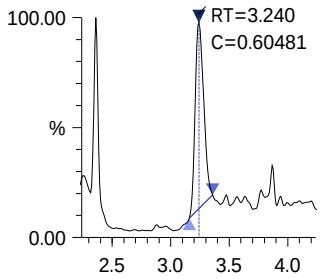
Date acquired: 9/15/2020 3:10:04 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_024.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE2	9/15/2020 3:10:04 PM	11634	0.60481	20200915_024	3.240	25.0000	1.0000	6
Sodium Perchlorate-18O4_IS	PERCHLORATE2	9/15/2020 3:10:04 PM	176422	1.00000	20200915_024	3.240	25.0000	1.0000	6

Perchlorate

Conc 0.60481
Area 11634

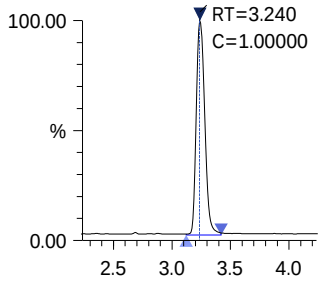
Q 99.00>83.00 (-) 2.66e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 176422

ISTD 107.00>89.00 (-) 3.50e4



ALS Group Houston

PERCHLORATE3

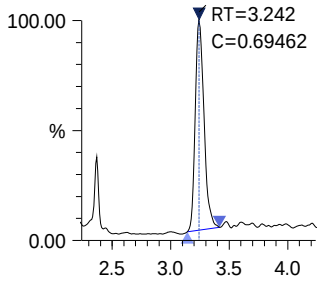
Date acquired: 9/15/2020 6:13:20 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_046.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE3	9/15/2020 6:13:20 PM	14722	0.69462	20200915_046	3.242	25.0000	1.0000	7
Sodium Perchlorate-18O4_IS	PERCHLORATE3	9/15/2020 6:13:20 PM	194971	1.00000	20200915_046	3.239	25.0000	1.0000	7

Perchlorate

Conc 0.69462
Area 14722

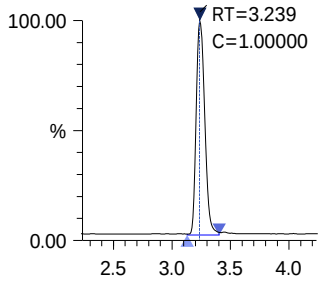
Q 99.00>83.00 (-) 2.91e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 194971

ISTD 107.00>89.00 (-) 3.85e4



ALS Group Houston

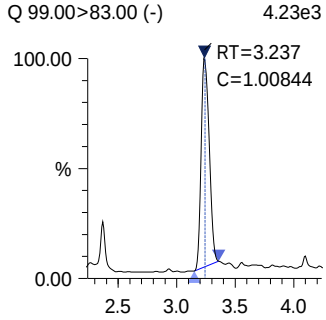
PERCHLORATE4

Date acquired: 9/15/2020 6:21:15 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_047.lcd
Vial: 8 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE4	9/15/2020 6:21:15 PM	19524	1.00844	20200915_047	3.237	25.0000	1.0000	8
Sodium Perchlorate-18O4_IS	PERCHLORATE4	9/15/2020 6:21:15 PM	179246	1.00000	20200915_047	3.240	25.0000	1.0000	8

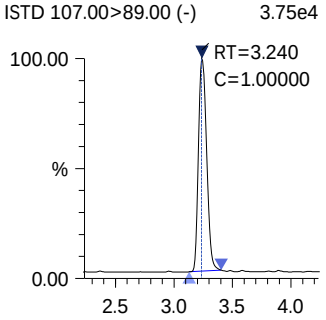
Perchlorate

Conc 1.00844
Area 19524



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 179246



ALS Group Houston

PERCHLORATE5

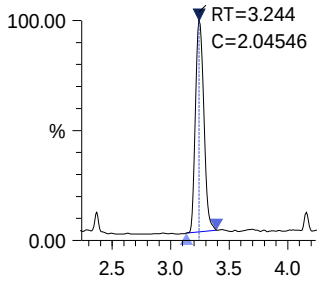
Date acquired: 9/15/2020 6:29:08 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_048.lcd
Vial: 9 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE5	9/15/2020 6:29:08 PM	38522	2.04546	20200915_048	3.244	25.0000	1.0000	9
Sodium Perchlorate-18O4_IS	PERCHLORATE5	9/15/2020 6:29:08 PM	175734	1.00000	20200915_048	3.240	25.0000	1.0000	9

Perchlorate

Conc 2.04546
Area 38522

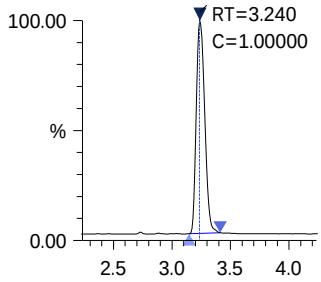
Q 99.00>83.00 (-) 7.92e3



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 175734

ISTD 107.00>89.00 (-) 3.56e4



ALS Group Houston

PERCHLORATE6

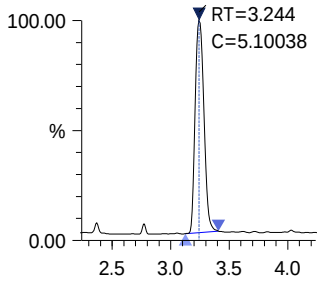
Date acquired: 9/15/2020 6:37:05 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_049.lcd
Vial: 10 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE6	9/15/2020 6:37:05 PM	92162	5.10038	20200915_049	3.244	25.0000	1.0000	10
Sodium Perchlorate-18O4_IS	PERCHLORATE6	9/15/2020 6:37:05 PM	169754	1.00000	20200915_049	3.239	25.0000	1.0000	10

Perchlorate

Conc 5.10038
Area 92162

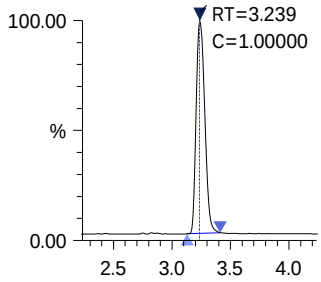
Q 99.00>83.00 (-) 1.81e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 169754

ISTD 107.00>89.00 (-) 3.37e4



ALS Group Houston

PERCHLORATE7

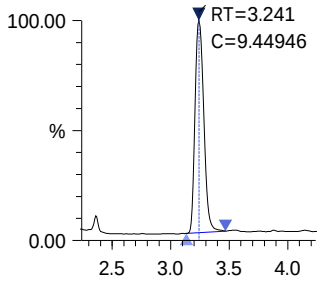
Date acquired: 9/15/2020 3:49:35 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_029.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	9/15/2020 3:49:35 PM	144012	9.44946	20200915_029	3.241	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	9/15/2020 3:49:35 PM	143911	1.00000	20200915_029	3.238	25.0000	1.0000	4

Perchlorate

Conc 9.44946
Area 144012

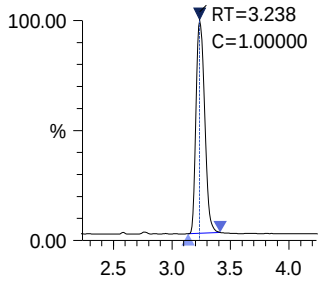
Q 99.00>83.00 (-) 2.81e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 143911

ISTD 107.00>89.00 (-) 2.84e4



ALS Group Houston

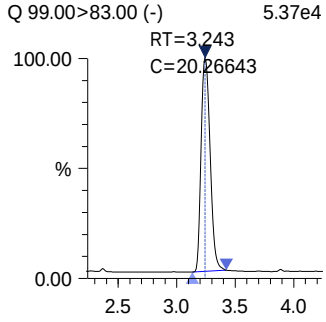
PERCHLORATE8

Date acquired: 9/15/2020 6:52:54 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_051.lcd
Vial: 11 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE8	9/15/2020 6:52:54 PM	284308	20.26643	20200915_051	3.243	25.0000	1.0000	11
Sodium Perchlorate-18O4_IS	PERCHLORATE8	9/15/2020 6:52:54 PM	133870	1.00000	20200915_051	3.240	25.0000	1.0000	11

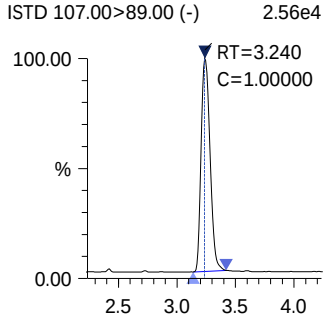
Perchlorate

Conc 20.26643
Area 284308



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 133870



ALS Group Houston

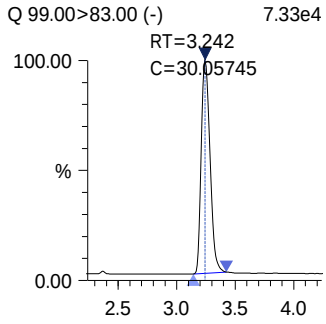
PERCHLORATE9

Date acquired: 9/15/2020 7:00:50 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_052.lcd
Vial: 12 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE9	9/15/2020 7:00:50 PM	377183	30.05745	20200915_052	3.242	25.0000	1.0000	12
Sodium Perchlorate-18O4_IS	PERCHLORATE9	9/15/2020 7:00:50 PM	120846	1.00000	20200915_052	3.240	25.0000	1.0000	12

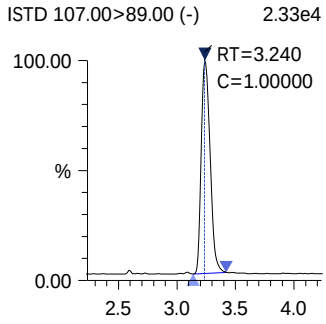
Perchlorate

Conc 30.05745
Area 377183



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 120846



ALS Group Houston

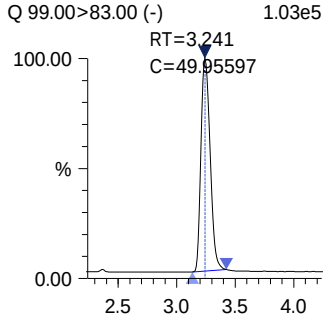
PERCHLORATE10

Date acquired: 9/15/2020 7:08:43 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_053.lcd
Vial: 13 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE10	9/15/2020 7:08:43 PM	553330	49.95597	20200915_053	3.241	25.0000	1.0000	13
Sodium Perchlorate-18O4_IS	PERCHLORATE10	9/15/2020 7:08:43 PM	108660	1.00000	20200915_053	3.240	25.0000	1.0000	13

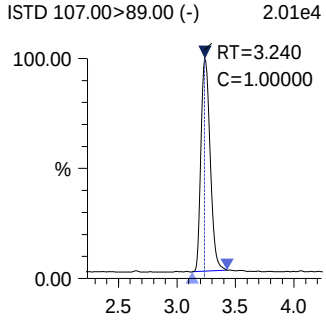
Perchlorate

Conc 49.95597
Area 553330



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 108660



ALS Group Houston

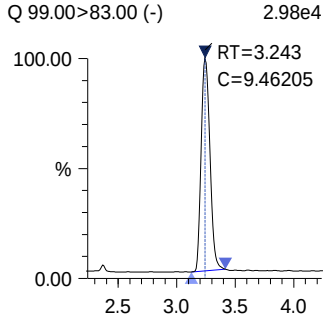
PERCHLORATEICV

Date acquired: 9/15/2020 7:16:39 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_054.lcd
Vial: 14 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATEICV	9/15/2020 7:16:39 PM	152650	9.46205	20200915_054	3.243	25.0000	1.0000	14
Sodium Perchlorate-18O4_IS	PERCHLORATEICV	9/15/2020 7:16:39 PM	152342	1.00000	20200915_054	3.241	25.0000	1.0000	14

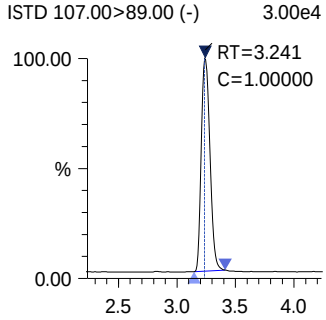
Perchlorate

Conc 9.46205
Area 152650



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 152342



Chromatograms and Selected Ion Monitoring

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 320, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20201009

ALS Environmental

ICAL Date: 9/15/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000032**

1st Review: Grivera
2nd Review: Kneir

Injection Log
LCMS01 -Shimadzu 8050

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	null		20201009_001	Perchlorate6850b.lcm	1x	☒		10/9/2020 13:57
2	null		20201009_002	Perchlorate6850b.lcm	1x	☒		10/9/2020 14:02
3	IB		20201009_003	Perchlorate6850b.lcm	1x	☒		10/9/2020 14:52
4	LODV		20201009_004	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:00
5	PERCHLORATE7		20201009_005	Perchlorate6850b.lcm	1x	☒	3100807-04	10/9/2020 15:08
6	ICS		20201009_006	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:16
7	EQ2000497-01		20201009_007	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:24
8	EQ2000497-02		20201009_008	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:32
9	EQ2000497-03		20201009_009	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:40
10	EQ2000497-04		20201009_010	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:48
11	EQ2000497-05		20201009_011	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:55
12	E2000943-001		20201009_012	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:03
13	E2000943-002		20201009_013	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:11
14	E2000944-001		20201009_014	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:19
15	E2000944-002		20201009_015	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:27
16	E2000944-003		20201009_016	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:35
17	PERCHLORATE7		20201009_017	Perchlorate6850b.lcm	1x	☒	3100807-04	10/9/2020 16:43
18	E2000944-004		20201009_018	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:51
19	E2000944-005		20201009_019	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:58
20	E2000944-006		20201009_020	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:06
21	E2000949-001		20201009_021	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:14
22	E2000949-002		20201009_022	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:22
23	E2000964-001		20201009_023	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:30
24	E2000964-002		20201009_024	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:38
25	E2000964-003		20201009_025	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:46
26	E2000964-004		20201009_026	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:54
27	E2000964-005		20201009_027	Perchlorate6850b.lcm	1x	☒		10/9/2020 18:02
28	PERCHLORATE7		20201009_028	Perchlorate6850b.lcm	1x	☒	3100807-04	10/9/2020 18:10
29	E2000964-006		20201009_029	Perchlorate6850b.lcm	1x	☒		10/9/2020 18:17
30	E2000964-007		20201009_030	Perchlorate6850b.lcm	1x	☒		10/9/2020 18:25
31	E2000964-008		20201009_031	Perchlorate6850b.lcm	1x	☒		10/9/2020 18:33
32	PERCHLORATE7		20201009_032	Perchlorate6850b.lcm	1x	☒	3100807-04	10/9/2020 18:41
33								
34								
35								
36								
37								
38								
39								

20201016

ALS Environmental

ICAL Date: 9/15/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000032**

1st Review: Grivera
2nd Review: Kneir

Injection Log
LCMS01 -Shimadzu 8050

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	null		20201016_001	Perchlorate6850b.lcm	1x	☒		10/16/2020 8:39
2	null		20201016_002	Perchlorate6850b.lcm	1x	☒		10/16/2020 8:44
3	IB		20201016_003	Perchlorate6850b.lcm	1x	☒		10/16/2020 8:49
4	IB		20201016_004	Perchlorate6850b.lcm	1x	☒		10/16/2020 8:57
5	LODV		20201016_005	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:05
6	ICS		20201016_006	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:13
7	PERCHLORATE7		20201016_007	Perchlorate6850b.lcm	1x	☒	3100807-04	10/16/2020 9:21
8	E2000943-001		20201016_008	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:33
9	E2000943-002		20201016_009	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:41
10	E2000944-001		20201016_010	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:49
11	E2000944-002		20201016_011	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:57
12	E2000944-003		20201016_012	Perchlorate6850b.lcm	1x	☒		10/16/2020 10:04
13	E2000944-004		20201016_013	Perchlorate6850b.lcm	1x	☒		10/16/2020 10:12
14	E2000944-005		20201016_014	Perchlorate6850b.lcm	1x	☒		10/16/2020 10:20
15	E2000944-006		20201016_015	Perchlorate6850b.lcm	1x	☒		10/16/2020 10:28
16	PERCHLORATE7		20201016_018	Perchlorate6850b.lcm	1x	☒	3100807-04	10/16/2020 10:52
17	E2000943-001X2		20201016_019	Perchlorate6850b.lcm	2x	☒		10/16/2020 11:06
18	E2000944-001X10		20201016_020	Perchlorate6850b.lcm	10x	☒		10/16/2020 11:14
19	E2000944-002X200		20201016_021	Perchlorate6850b.lcm	200x	☒		10/16/2020 11:22
20	E2000944-003X200		20201016_022	Perchlorate6850b.lcm	200x	☒		10/16/2020 11:30
21	E2000944-004X200		20201016_023	Perchlorate6850b.lcm	200x	☒		10/16/2020 11:38
22	E2000944-005X100		20201016_024	Perchlorate6850b.lcm	100x	☒		10/16/2020 11:46
23	E2000944-006X1000		20201016_025	Perchlorate6850b.lcm	1000x	☒		10/16/2020 11:54
24	EQ2000497-05		20201016_027	Perchlorate6850b.lcm	10x	☒		10/16/2020 12:09
25	PERCHLORATE7		20201016_028	Perchlorate6850b.lcm	1x	☒	3100807-04	10/16/2020 12:17
26	EQ2000497-04		20201016_029	Perchlorate6850b.lcm	10x	☒		10/16/2020 12:25
27	PERCHLORATE7		20201016_030	Perchlorate6850b.lcm	1x	☒	3100807-04	10/16/2020 12:36
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20080476

Service Request: E2000944
Date Analyzed: 10/16/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201016\20201016_007

Calibration Date: 9/15/20
Calibration ID: EC2000032
Analysis Lot: 699559
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.82	NA	NA	NA	-1.8	± 15 %	Quadratic

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20080476

Service Request: E2000944
Date Analyzed: 10/16/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201016\20201016_018

Calibration Date: 9/15/20
Calibration ID: EC2000032
Analysis Lot: 699559
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.4	NA	NA	NA	4.3	± 15 %	Quadratic

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20080476

Service Request: E2000944
Date Analyzed: 10/16/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201016\20201016_028

Calibration Date: 9/15/20
Calibration ID: EC2000032
Analysis Lot: 699559
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.2	NA	NA	NA	1.8	± 15 %	Quadratic

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20080476

Service Request: E2000944
Date Analyzed: 10/16/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201016\20201016_030

Calibration Date: 9/15/20
Calibration ID: EC2000032
Analysis Lot: 699559
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.2	NA	NA	NA	2.2	± 15 %	Quadratic

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20080476	**Date Analyzed:**	10/16/20 09:21

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201016\20201016_007	**Lab Code:**	EQ2000509-01
Instrument ID:	E-LCMS-01	**Analysis Lot:**	699559
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	160,593	3.24
	Upper Limit ==>	240,890	5.24
	Lower Limit ==>	80,297	1.24
Associated Analyses			
Continuing Calibration Verification	EQ2000509-01	140,874	3.09

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20080476	**Date Analyzed:**	10/16/20 10:52

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201016\20201016_018	**Lab Code:**	EQ2000509-02
Instrument ID:	E-LCMS-01	**Analysis Lot:**	699559
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	160,593	3.24
	Upper Limit ==>	240,890	5.24
	Lower Limit ==>	80,297	1.24
Associated Analyses			
Continuing Calibration Verification	EQ2000509-02	134,004	3.10
50WW14-201001	E2000944-001	127,843	3.09
50WW13-201001	E2000944-002	130,591	3.09
50WW11-201001	E2000944-003	114,992	3.09
50WW11-201001-FD	E2000944-004	103,249	3.10
50WW06-201001	E2000944-005	119,706	3.09
50WW12-201001	E2000944-006	110,535	3.10
50WW14-201001DMS	EQ2000497-05	124,382	3.09

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20080476	**Date Analyzed:**	10/16/20 12:17

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201016\20201016_028	**Lab Code:**	EQ2000509-03
Instrument ID:	E-LCMS-01	**Analysis Lot:**	699559
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	160,593	3.24
	Upper Limit ==>	240,890	5.24
	Lower Limit ==>	80,297	1.24
Associated Analyses			
Continuing Calibration Verification	EQ2000509-03	137,447	3.09
50WW14-201001MS	EQ2000497-04	138,818	3.06

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20080476	**Date Analyzed:**	10/16/20 12:36

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201016\20201016_030	**Lab Code:**	EQ2000509-04
Instrument ID:	E-LCMS-01	**Analysis Lot:**	699559
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	160,593	3.24
	Upper Limit ==>	240,890	5.24
	Lower Limit ==>	80,297	1.24
Associated Analyses			
Continuing Calibration Verification	EQ2000509-04	140,968	3.05

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group Houston

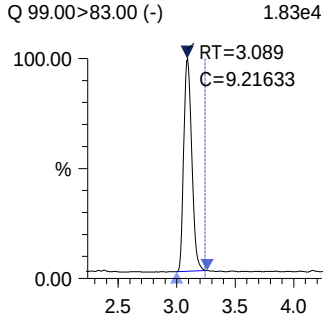
PERCHLORATE7

Date acquired: 10/9/2020 3:08:25 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201009\20201009_005.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/9/2020 3:08:25 PM	86435	9.21633	20201009_005	3.089	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/9/2020 3:08:25 PM	88538	1.00000	20201009_005	3.087	25.0000	1.0000	4

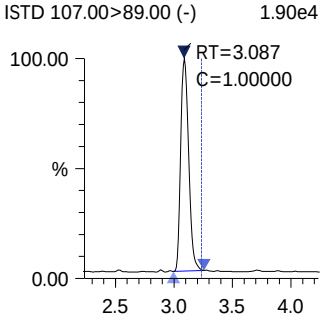
Perchlorate

Conc 9.21633
Area 86435



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 88538



ALS Group Houston

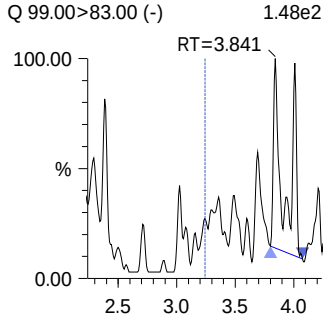
EQ2000497-01

Date acquired: 10/9/2020 3:24:21 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201009\20201009_007.lcd
Vial: 16 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000497-01	10/9/2020 3:24:21 PM	----	----	20201009_007	----	25.0000	1.0000	16
Sodium Perchlorate-18O4_IS	EQ2000497-01	10/9/2020 3:24:21 PM	96808	1.00000	20201009_007	3.098	25.0000	1.0000	16

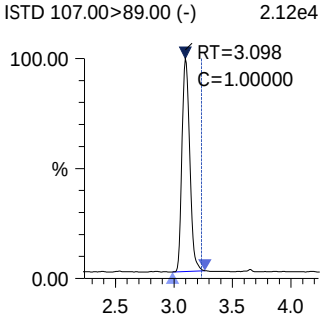
Perchlorate

Conc ----
Area ----



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 96808



ALS Group Houston

EQ2000497-02

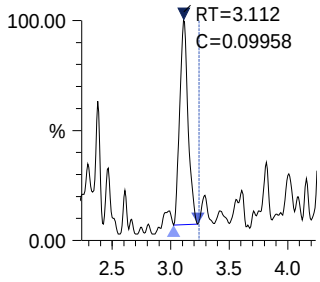
Date acquired: 10/9/2020 3:32:16 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201009\20201009_008.lcd
Vial: 17 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000497-02	10/9/2020 3:32:16 PM	1240	0.09958	20201009_008	3.112	25.0000	1.0000	17
Sodium Perchlorate-18O4_IS	EQ2000497-02	10/9/2020 3:32:16 PM	102528	1.00000	20201009_008	3.102	25.0000	1.0000	17

Perchlorate

Conc 0.09958
Area 1240

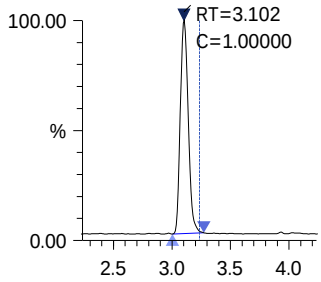
Q 99.00>83.00 (-) 2.59e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 102528

ISTD 107.00>89.00 (-) 2.19e4



ALS Group Houston

EQ2000497-03

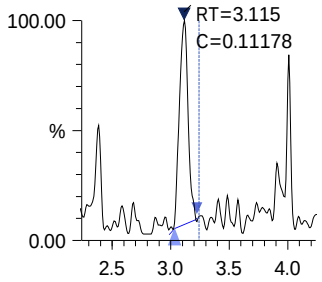
Date acquired: 10/9/2020 3:40:10 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201009\20201009_009.lcd
Vial: 18 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000497-03	10/9/2020 3:40:10 PM	1391	0.11178	20201009_009	3.115	25.0000	1.0000	18
Sodium Perchlorate-18O4_IS	EQ2000497-03	10/9/2020 3:40:10 PM	103828	1.00000	20201009_009	3.100	25.0000	1.0000	18

Perchlorate

Conc 0.11178
Area 1391

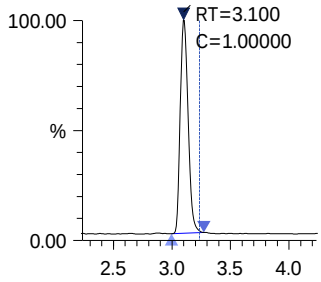
Q 99.00>83.00 (-) 3.62e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 103828

ISTD 107.00>89.00 (-) 2.24e4



ALS Group Houston

PERCHLORATE7

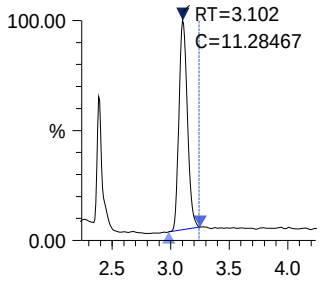
Date acquired: 10/9/2020 4:43:14 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201009\20201009_017.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/9/2020 4:43:14 PM	105826	11.28467	20201009_017	3.102	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/9/2020 4:43:14 PM	88721	1.00000	20201009_017	3.101	25.0000	1.0000	4

Perchlorate

Conc 11.28467
Area 105826

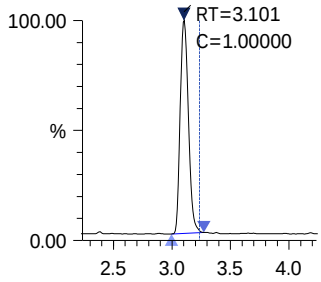
Q 99.00>83.00 (-) 2.14e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 88721

ISTD 107.00>89.00 (-) 1.83e4



ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

October 08, 2020

Analytical Report for Service Request No: K2008877

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: HS20100074

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 06, 2020
For your reference, these analyses have been assigned our service request number **K2008877.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

for Kelley Lovejoy
Project Manager

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

Table of Contents

Acronyms
Qualifiers
State Certifications, Accreditations, And Licenses
Case Narrative
Chain of Custody
General Chemistry
Raw Data
    General Chemistry

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
LOD	Limit of Detection
LOQ	Limit of Quantitation
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.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
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.
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.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: HS20100074
Sample Matrix: Ground Water

Service Request: K2008877
Date Received: 10/06/2020

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 ground water samples were received for analysis at ALS Environmental on 10/06/2020. 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.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Mae D. Davis Date 10/08/2020

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

K2008877

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:** **14817**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626

Phone: +1 360 501 3312

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:	HS20100074
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20100074-01**	**50WW14-201001**	**Groundwater**	**01 Oct 2020 07:55**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			09 Oct 2020
2.	**HS20100074-02**	**50WW13-201001**	**Groundwater**	**01 Oct 2020 09:05**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			09 Oct 2020
3.	**HS20100074-03**	**50WW11-201001**	**Groundwater**	**01 Oct 2020 09:55**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			09 Oct 2020
4.	**HS20100074-04**	**50WW11-201001-FD**	**Groundwater**	**01 Oct 2020 09:55**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			09 Oct 2020
5.	**HS20100074-05**	**50WW06-201001**	**Groundwater**	**01 Oct 2020 10:50**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			09 Oct 2020
6.	**HS20100074-06**	**50WW12-201001**	**Groundwater**	**01 Oct 2020 11:40**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			09 Oct 2020

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

HS20100074-01 MS/MSD

QC Level: DOD IV (DoD Data Package)

Received by Mkelerson 10/6/2020 0945

K2008877

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 14817**

Relinquished By: 10/5/2020 Date/Time: 18:10.

Received By: Date/Time: 10/6/2020 0945

Cooler ID(s): Temperature(s):

PM KL

Cooler Receipt and Preservation Form

Client AIS Houston Service Request K20 08877

Received: 10/6/2020 Opened: 10/6/2020 By: NP Unloaded: 10/6/2020 By: NP

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2 front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N
4. Was a Temperature Blank present in cooler? NA (Y) N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA (Y) N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. (NA) Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
0.9	—	IR01		—	—	1891 8681 1876	
			14815				
			14817				
			14811				

6. Packing material: *Inserts* (*Baggies*) (*Bubble Wrap*) *Gel Packs* (*Wet Ice*) *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
8. Were samples received in good condition (unbroken) NA (Y) N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA (Y) N
10. Did all sample labels and tags agree with custody papers? NA (Y) N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA (Y) N
13. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
14. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: _____

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K2008877
Project:	HS20100074	**Date Collected:**	10/1/20
Sample Matrix:	Ground Water	**Date Received:**	10/6/20
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
50WW14-201001	K2008877-001	**1.58**	0.50	0.20	0.07	1	10/07/20 18:15	
50WW13-201001	K2008877-002	**3.54**	0.50	0.20	0.07	1	10/07/20 18:15	
50WW11-201001	K2008877-003	**1.82**	0.50	0.20	0.07	1	10/07/20 18:15	
50WW11-201001-FD	K2008877-004	**1.86**	0.50	0.20	0.07	1	10/07/20 18:15	
50WW06-201001	K2008877-005	**6.09**	0.50	0.20	0.07	1	10/07/20 18:15	
50WW12-201001	K2008877-006	**1.14**	0.50	0.20	0.07	1	10/07/20 18:15	
Method Blank	K2008877-MB	ND U	0.50	0.20	0.07	1	10/07/20 18:15	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2008877
Project	HS20100074	**Date Collected:**	10/01/20
Sample Matrix:	Ground Water	**Date Received:**	10/06/20
		Date Analyzed:	10/07/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	50WW14-201001	**Units:**	mg/L
Lab Code:	K2008877-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K2008877-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	1.58	1.56	1.57	1	10

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

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2008877
Project:	HS20100074	**Date Collected:**	10/01/20
Sample Matrix:	Ground Water	**Date Received:**	10/06/20
		Date Analyzed:	10/7/20
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	50WW14-201001	**Units:**	mg/L
Lab Code:	K2008877-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K2008877-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	1.58	28.0	25.0	106	83-117

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.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2008877
Project:	HS20100074	**Date Analyzed:**	10/07/20
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	698234

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2008877-LCS	24.1	25.0	96	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K2008877
Project: HS20100074

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	698234	KQ2014960-09	10/07/20 18:15	25.0	25.9	103	90-110
CCV2	698234	KQ2014960-10	10/07/20 18:15	25.0	25.4	102	90-110
CCV3	698234	KQ2014960-11	10/07/20 18:15	25.0	24.9	100	90-110
CCV4	698234	KQ2014960-12	10/07/20 18:15	25.0	25.2	101	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K2008877
Project: HS20100074

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

Analysis Method: SM 5310 C **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	698234	KQ2014960-05	10/07/20 18:15	0.50	0.20	0.07	ND	U
CCB2	698234	KQ2014960-06	10/07/20 18:15	0.50	0.20	0.07	ND	U
CCB3	698234	KQ2014960-07	10/07/20 18:15	0.50	0.20	0.07	ND	U
CCB4	698234	KQ2014960-08	10/07/20 18:15	0.50	0.20	0.07	ND	U

Raw Data

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

Work Request # 8311 8157 8557 8870 8740

Tier: II IV II IV IV

Date Analyzed: 10-6-20

Analyst: MK

Run # 698234 | 698233

Analysis: DOC | DOC

DATA QUALITY REPORT
INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1.	Is the method name and number correct and appropriate?	yes/no/NA
2.	Holding times met for all analyses and for all samples?	yes/no/NA
3.	Are calculations correct?	yes/no/NA
4.	Is the reporting basis correct? (Dry Weight)	yes/no/NA
5.	All quality control criteria met?	yes/no
6.	Is the calibration curve correlation coefficient ≥ 0.995?	yes/no/NA
7.	MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?	yes/no/NA
8.	Are ICVs, CCVs, and CCBs all within acceptance limits?	yes/no/NA
9.	Are results for methods blanks all ND?	yes/no/NA
10.	Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)	yes/no/NA
11.	Are all exceptions explained?	yes/no/NA
12.	Have all applicable service requests been reviewed?	yes/no/NA
13.	Are all samples labeled correctly?	yes/no/NA
14.	Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V)	yes/no/NA
15.	Are detection limits and units reported correctly?	yes/no/NA
16.	Is the unused space on the benchsheet crossed out?	yes/no/NA
17.	Was analysis turned in by the due date? (n-2) (If not record SR#)	yes/no/NA

COMMENTS:

Final Approved by: _____ Date: 10/7/20

DOREPORT

Analytical Results Summary

Instrument Name: K-TOC-01 **Analyst:** MKANALY **Analysis Lot:** 698233 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K2008311-001	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.28 mg/L	10 mL	1.28 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-002	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.77 mg/L	10 mL	1.77 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-003	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	0.54 mg/L	10 mL	0.54 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-004	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.07 mg/L	10 mL	1.07 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-005	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.41 mg/L	10 mL	1.41 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-006	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.45 mg/L	10 mL	2.45 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-007	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.63 mg/L	10 mL	2.63 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-008	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.59 mg/L	10 mL	2.59 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-009	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.61 mg/L	10 mL	2.61 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-010	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	0.94 mg/L	10 mL	0.94 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-011	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.53 mg/L	10 mL	2.53 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-012	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.54 mg/L	10 mL	2.54 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
KQ2014958-01	Carbon, Dissolved Organic (DOC)	MB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/6/20 18:15:00	N	II
KQ2014958-02	Carbon, Dissolved Organic (DOC)	LCS		Surface Water	23.68 mg/L	10 mL	23.7 mg/L	1	0.07	0.50	95		10/6/20 18:15:00	N	II
KQ2014958-03	Carbon, Dissolved Organic (DOC)	DLCS		Surface Water	23.79 mg/L	10 mL	23.8 mg/L	1	0.07	0.50	95	<1	10/6/20 18:15:00	N	II
KQ2014958-04	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/6/20 18:15:00	N	II
KQ2014958-05	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/6/20 18:15:00	N	II
KQ2014958-06	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/6/20 18:15:00	N	II
KQ2014958-07	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/6/20 18:15:00	N	II
KQ2014958-08	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	25.86 mg/L	10 mL	25.9 mg/L	1					10/6/20 18:15:00	N	II
KQ2014958-09	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	25.38 mg/L	10 mL	25.4 mg/L	1					10/6/20 18:15:00	N	II
KQ2014958-10	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.90 mg/L	10 mL	24.9 mg/L	1					10/6/20 18:15:00	N	II
KQ2014958-11	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	25.21 mg/L	10 mL	25.2 mg/L	1					10/6/20 18:15:00	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-01 **Analyst:** MKANALY **Analysis Lot:** 698234 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K2008157-001	Carbon, Total Organic	N/A		Water	2.34 mg/L	10 mL	2.34 mg/L	1	0.07	0.50			10/7/20 18:15:00	N	IV
K2008557-001	Carbon, Total Organic	N/A		Water	5.30 mg/L	10 mL	5.30 mg/L	1	0.07	0.50			10/7/20 18:15:00	N	II
K2008740-001	Carbon, Total Organic	N/A		Water	2.17 mg/L	10 mL	2.17 mg/L	1	0.07	0.50			10/7/20 18:15:00	N	IV
K2008877-001	Carbon, Total Organic	N/A		Ground Water	1.58 mg/L	10 mL	1.58 mg/L	1	0.07	0.50			10/7/20 18:15:00	Y	IV
K2008877-002	Carbon, Total Organic	N/A		Ground Water	3.54 mg/L	10 mL	3.54 mg/L	1	0.07	0.50			10/7/20 18:15:00	N	IV
K2008877-003	Carbon, Total Organic	N/A		Ground Water	1.82 mg/L	10 mL	1.82 mg/L	1	0.07	0.50			10/7/20 18:15:00	N	IV
K2008877-004	Carbon, Total Organic	N/A		Ground Water	1.86 mg/L	10 mL	1.86 mg/L	1	0.07	0.50			10/7/20 18:15:00	N	IV
K2008877-005	Carbon, Total Organic	N/A		Ground Water	6.09 mg/L	10 mL	6.09 mg/L	1	0.07	0.50			10/7/20 18:15:00	N	IV
K2008877-006	Carbon, Total Organic	N/A		Ground Water	1.14 mg/L	10 mL	1.14 mg/L	1	0.07	0.50			10/7/20 18:15:00	N	IV
KQ2014960-01	Carbon, Total Organic	DUP	K2008877-001	Ground Water	1.56 mg/L	10 mL	1.56 mg/L	1	0.07	0.50		1	10/7/20 18:15:00	N	IV
KQ2014960-02	Carbon, Total Organic	MS	K2008877-001	Ground Water	28.02 mg/L	10 mL	28.0 mg/L	1	0.07	0.50	106		10/7/20 18:15:00	N	IV
KQ2014960-03	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/7/20 18:15:00	N	IV
KQ2014960-04	Carbon, Total Organic	LCS		Water	24.09 mg/L	10 mL	24.1 mg/L	1	0.07	0.50	96		10/7/20 18:15:00	N	IV
KQ2014960-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/7/20 18:15:00	N	IV
KQ2014960-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/7/20 18:15:00	N	IV
KQ2014960-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/7/20 18:15:00	N	IV
KQ2014960-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/7/20 18:15:00	N	IV
KQ2014960-09	Carbon, Total Organic	CCV		Water	25.86 mg/L	10 mL	25.9 mg/L	1					10/7/20 18:15:00	N	IV
KQ2014960-10	Carbon, Total Organic	CCV		Water	25.38 mg/L	10 mL	25.4 mg/L	1					10/7/20 18:15:00	N	IV
KQ2014960-11	Carbon, Total Organic	CCV		Water	24.90 mg/L	10 mL	24.9 mg/L	1					10/7/20 18:15:00	N	IV
KQ2014960-12	Carbon, Total Organic	CCV		Water	25.21 mg/L	10 mL	25.2 mg/L	1					10/7/20 18:15:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Schedule: 100620

Version: 7
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2020/10/07 08:07 - Wednesday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K2008157-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K2008877-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
5	Sample	K2008877-001D	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
6	Sample	K2008877-001MS	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K2008877-002	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K2008877-003	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K2008877-004	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K2008877-005	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K2008877-006	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K2008311-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K2008311-002	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K2008311-003	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K2008311-004	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K2008311-005	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
17	Sample	K2008311-006	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K2008311-007	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
19	Sample	K2008311-008	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
22	Sample	K2008311-009	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K2008311-010	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K2008311-011	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K2008311-012	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K2008311-005	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K2008311-007	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K2008311-008	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K2008557-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K208740-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

Fusion Report - 100620
Tuesday, October 06, 2020 06:15 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2020/10/07 11:56 - Wednesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	100620	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v1) Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v4) Fusion1 (Fusion1) (v5) Fusion1 (Fusion1) (v7)		
Comment:			

Report Results

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/10/06 18:15

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.41	27.59	14.18	49.65	05:27
2	TC Clean	8.03	21.21	13.18	49.84	07:17
3	TC Clean	1.28	14.58	13.30	49.75	07:00
4	TC Clean	0.76	14.06	13.30	50.00	07:03

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/10/06 18:47

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	-0.20	13.01	13.21	49.62	05:25
2	TC Clean	3.49	16.68	13.19	49.77	07:18

3	TC Clean	0.64	13.85	13.21	50.00	07:03
4	TC Clean	0.47	13.55	13.08	49.87	07:02

Sample Type: Clean From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/10/06 19:18

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	-0.51	12.67	13.18	49.67	05:17
2	TC Clean	3.48	16.35	12.87	49.76	07:16
3	TC Clean	0.39	13.46	13.07	49.89	07:02
4	TC Clean	0.29	13.36	13.07	49.77	07:02

Sample Type: Blank (Creating v1457) From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2020/10/06 19:50

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	-0.52	12.41	12.93	49.71	05:18
2	TC Clean	3.73	16.66	12.93	49.66	07:15
3	TC Clean	0.71	13.83	13.12	49.64	07:00
4	TC Clean	0.66	13.90	13.24	49.92	07:02
5	Reagent Blank	5.08	18.08	13.00	49.78	08:13
6	Acid Blank	-0.13	12.89	13.02	49.85	08:02

Sample Type: Sample From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/10/06 20:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.97	22.00	13.04	49.83	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.8559 ppm (PASS)	0.0000 ppm	0%	2020/10/06 20:58

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.8559	258.5594	191.27	204.27	13.01	49.94	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 4

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/10/06 21:12

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.74	20.71	12.98	49.85	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample From Schedule Version 4

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2020/10/06 21:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.62	20.42	12.80	49.99	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> LCS From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.0885 ppm (PASS)	0.0000 ppm	0%	2020/10/06 21:42

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.0885	240.8854	178.87	191.80	12.93	49.92	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	25 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	2	TOC	ICS	0.0819 ppm	0.0000 ppm	0.0000%	2020/10/06 21:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0819	0.8188	9.82	22.51	12.69	49.89	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	K2008157-001	2.3388 ppm	0.1008 ppm	4.3100%	2020/10/06 22:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4101	24.1009	26.15	38.83	12.68	50.03	10:31
2	TOC	2.2675	22.6753	25.15	38.05	12.90	49.99	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K2008877-001	1.5821 ppm	0.0274 ppm	1.7300%	2020/10/06 22:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6015	16.0152	20.48	33.42	12.95	49.96	10:25
2	TOC	1.5627	15.6274	20.20	33.25	13.04	49.95	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	K2008877-001D	1.5647 ppm	0.0668 ppm	4.2700%	2020/10/06 23:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6119	16.1192	20.55	33.17	12.62	49.94	10:29
2	TOC	1.5174	15.1741	19.89	33.01	13.12	49.93	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	6	TOC	K2008877-001MS	28.0161 ppm	0.0492 ppm	0.1800%	2020/10/06 23:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.9814	279.8136	205.53	218.52	12.99	49.94	10:28
2	TOC	28.0509	280.5092	206.01	219.09	13.08	49.94	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	7	TOC	K2008877-002	3.5402 ppm	0.1013 ppm	2.8600%	2020/10/07 00:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.6118	36.1183	34.58	47.62	13.04	49.94	10:30
2	TOC	3.4686	34.6856	33.57	46.63	13.05	49.95	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	8	TOC	K2008877-003	1.8176 ppm	0.0053 ppm	0.2900%	2020/10/07 00:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8213	18.2134	22.02	35.06	13.04	49.95	10:31
2	TOC	1.8138	18.1378	21.96	34.95	12.99	49.96	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	9	TOC	K2008877-004	1.8570 ppm	0.0175 ppm	0.9400%	2020/10/07 01:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8694	18.6938	22.35	35.39	13.03	49.97	10:27
2	TOC	1.8446	18.4457	22.18	35.16	12.98	49.97	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.3819 ppm (PASS)	0.0000 ppm	0%	2020/10/07 01:27

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.3819	253.8195	187.94	200.90	12.96	49.96	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/10/07 01:42

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.59	20.69	13.10	50.00	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K2008877-005	6.0944 ppm	0.0221 ppm	0.3600%	2020/10/07 01:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.0787	60.7875	51.88	65.00	13.12	49.99	10:26
2	TOC	6.1100	61.0997	52.10	65.18	13.08	50.00	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K2008877-006	1.1383 ppm	0.0134 ppm	1.1800%	2020/10/07 02:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1478	11.4776	17.29	30.30	13.01	50.04	10:26
2	TOC	1.1288	11.2880	17.16	30.11	12.95	50.04	10:25

Dilution	Blank Contribution	Method	Calibration

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	12	TOC	K2008311-001	1.2840 ppm	0.0012 ppm	0.0900%	2020/10/07 02:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2832	12.8319	18.24	31.38	13.14	50.04	10:25
2	TOC	1.2849	12.8490	18.26	31.32	13.07	50.05	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	13	TOC	K2008311-002	1.7744 ppm	0.0365 ppm	2.0600%	2020/10/07 03:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7486	17.4863	21.51	34.66	13.15	50.05	10:29
2	TOC	1.8002	18.0024	21.87	34.80	12.93	50.05	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	14	TOC	K2008311-003	0.5426 ppm	0.0216 ppm	3.9800%	2020/10/07 03:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5274	5.2736	12.94	26.10	13.16	50.07	10:27
2	TOC	0.5579	5.5787	13.16	26.24	13.08	50.07	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	15	TOC	K2008311-004	1.0718 ppm	0.0310 ppm	2.9000%	2020/10/07 04:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0498	10.4983	16.61	29.82	13.21	50.07	10:26
2	TOC	1.0937	10.9373	16.91	30.00	13.08	50.09	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	16	TOC	K2008311-005	1.4339 ppm	0.0000 ppm	0.0000%	2020/10/07 04:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4339	14.3387	19.30	32.25	12.95	50.12	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	17	TOC	K2008311-006	2.4503 ppm	0.0069 ppm	0.2800%	2020/10/07 05:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4454	24.4544	26.40	39.68	13.29	50.12	10:27
2	TOC	2.4551	24.5514	26.46	39.48	13.02	50.12	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	18	TOC	K2008311-007	2.6971 ppm	0.0000 ppm	0.0000%	2020/10/07 05:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6971	26.9705	28.16	41.38	13.22	50.13	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	19	TOC	K2008311-008	2.6425 ppm	0.0000 ppm	0.0000%	2020/10/07 05:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6425	26.4245	27.78	41.02	13.25	50.14	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.8974 ppm (PASS)	0.0000 ppm	0%	2020/10/07 05:57

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.8974	248.9740	184.54	197.90	13.36	50.16	10:27

Completion State	Success Action	Method	Calibration	STD Conc - Pos B

Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/10/07 06:11

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.86	21.08	13.22	50.16	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2020/10/07 06:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.82	21.20	13.38	50.18	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> LCS From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	23.6770 ppm (PASS)	0.0000 ppm	0%	2020/10/07 06:41

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	23.6770	236.7699	175.98	189.20	13.22	50.19	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	25 ppmC

Sample Type: Check Standard --> LCS From Schedule Version 5

	Pos	BAT	Concentration	Dil	Sample ID	Min / Max	Result	Std. Dev.	RSD	Start Time

			(ppm)			(% dev)				
◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	23.7946 ppm (PASS)	0.0000 ppm	0%	2020/10/07 06:55

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	23.7946	237.9459	176.81	190.08	13.28	50.19	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	25 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	22	TOC	K2008311-009	2.6083 ppm	0.0249 ppm	0.9500%	2020/10/07 07:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5907	25.9071	27.42	40.72	13.30	50.18	10:27
2	TOC	2.6259	26.2592	27.66	40.84	13.18	50.18	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	23	TOC	K2008311-010	0.9351 ppm	0.0634 ppm	6.7800%	2020/10/07 07:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8903	8.9031	15.49	28.77	13.28	50.16	10:29
2	TOC	0.9800	9.7997	16.12	29.31	13.19	50.15	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Sample From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	24	TOC	K2008311-011	2.5265 ppm	0.0001 ppm	0.0000%	2020/10/07 08:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5264	25.2641	26.96	40.12	13.16	50.11	10:28
2	TOC	2.5266	25.2656	26.96	40.26	13.29	50.15	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	25	TOC	K2008311-012	2.5421 ppm	0.0321 ppm	1.2600%	2020/10/07 08:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5194	25.1943	26.92	40.18	13.27	50.16	10:28
2	TOC	2.5648	25.6476	27.23	40.33	13.10	50.09	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	16	TOC	K2008311-005	1.4069 ppm	0.0034 ppm	0.2400%	2020/10/07 09:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4045	14.0450	19.09	32.07	12.98	50.04	10:26
2	TOC	1.4094	14.0935	19.13	32.25	13.12	50.03	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	18	TOC	K2008311-007	2.6313 ppm	0.0468 ppm	1.7800%	2020/10/07 09:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5983	25.9826	27.47	40.64	13.17	50.00	10:28
2	TOC	2.6644	26.6441	27.93	41.08	13.15	50.04	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	19	TOC	K2008311-008	2.5927 ppm	0.0030 ppm	0.1200%	2020/10/07 10:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5948	25.9484	27.44	40.63	13.18	50.06	10:27
2	TOC	2.5906	25.9056	27.41	40.61	13.19	50.04	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	26	TOC	K2008557-001	5.2985 ppm	0.0286 ppm	0.5400%	2020/10/07 10:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.3188	53.1878	46.55	59.41	12.86	49.96	10:26

2	TOC	5.2783	52.7830	46.27	59.06	12.79	50.13	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	27	TOC	K208740-001	2.1675 ppm	0.0083 ppm	0.3800%	2020/10/07 10:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1616	21.6161	24.40	37.49	13.09	50.02	10:29
2	TOC	2.1733	21.7330	24.49	37.36	12.87	49.96	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.2062 ppm (PASS)	0.0000 ppm	0%	2020/10/07 11:24

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.2062	252.0618	186.71	199.68	12.97	50.04	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/10/07 11:39

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.83	20.99	13.16	49.99	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1456	1.6967	0.1340	0.0000	0.0000	0.0000	2020/10/05 21:31	Fusion1 (Fusion1)
v1457	1.6940	-0.1340	0.0000	0.0000	0.0000	2020/10/06 20:38	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v38
Ver Creation: 2020/06/13 16:40
Comment:
Operator: Fusion1 (Fusion1)
Basic Analysis Type: TOC
Calibration curve formula: TOC: y = 7.015x + 9.892
r^2 value: TOC: r^2 = 0.99974

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	9.5750	0.0000		2020/06/13 15:13
0.500 ppm	12.9010	0.5000		2020/06/13 15:28
1.0 ppm	15.6320	1.0000		2020/06/13 15:42
5.0 ppm	43.2510	5.0000		2020/06/13 15:56
10 ppm	82.4040	10.0000		2020/06/13 16:11
25 ppm	188.6880	25.0000		2020/06/13 16:25
50 ppm	358.6500	50.0000		2020/06/13 16:39

Methods

Name: CAS_salt_010711 (TOC)

Version: v4
Ver Creation: 2019/02/21 17:57
Comment:
Operator: Fusion1 (Fusion1)

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7

PreSpargeTime	2.00 mins	SyringeSpeedDIWater	7
SystemFlow	500 ml/min	NDIRPressurization	60 psig
		SyringeSpeedSampleDispense	5
		SyringeSpeedSampleAspirate	4
		SyringeSpeedUVDispense	5
		SyringeSpeedUVAspirate	5
		SyringeSpeedICDispense	5
		SyringeSpeedICAspirate	5
		NDIRPressureStabilize	1.75 min
		SampleMixing	Off
		SampleMixingCycles	1
		SampleMixingVolume	10.0
		LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2020/10/07 11:53

ALS Environmental

StarLIMS Ru 698233/698234

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 19-GEN-8-40-C 50 ppm LCS: 19-GEN-8-41-k 25.0 ppm

ICAL Date: 6/16/2020

ICAL ID: 19-GEN-8-22-G

ICS ID: 19-GEN-8-35-J

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 19-GEN-8-15-B 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 19-GEN-08-45-J

21 % H3PO4: 19-GEN-08-46-F

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

Analyzed By: MK	Date Analyzed: 10-6-20
Reviewed By: JK	Date Reviewed: 10/7/20

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

LABORATORY REPORT

October 16, 2020

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road Suite 210
Houston, TX 77099-4338

RE: HS20100074

Dear RJ:

Enclosed are the results of the samples submitted to our laboratory on October 6, 2020. For your reference, these analyses have been assigned our service request number P2005613.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Hayden Akers at 3:51 pm, Oct 16, 2020

Hayden Akers
Project Manager

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

Client: ALS Laboratory Group
Project: HS20100074

Service Request No: P2005613

CASE NARRATIVE

The samples were received intact under chain of custody on October 6, 2020 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Carbon Dioxide Analysis

The samples were analyzed for carbon dioxide using a gas chromatograph equipped with a thermal conductivity detector (TCD). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least four hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (carbon dioxide) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175 as described in laboratory SOP VOA-DISGAS. This analyte is included on the laboratory's NELAP and DoD-ELAP scope of accreditation.

Methane, Ethene and Ethane Analysis

The samples were also analyzed for methane, ethene, and ethane using a gas chromatograph equipped with a flame ionization detector (FID). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least two hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (methane, ethene and ethane) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP or DoD-ELAP accreditation.

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 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.

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2018027
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1776326
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-007
Pennsylvania DEP	http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413-19-10
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272019-10
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: ALS Laboratory Group
Project ID: HS20100074

Service Request: P2005613

Date Received: 10/6/2020
Time Received: 11:10

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - CO2	RSK 175 - Gases
50WW14-201001	P2005613-001	Water	10/1/2020	07:55	X	X
50WW13-201001	P2005613-002	Water	10/1/2020	09:05	X	X
50WW11-201001	P2005613-003	Water	10/1/2020	09:55	X	X
50WW11-201001-FD	P2005613-004	Water	10/1/2020	09:55	X	X
50WW06-201001	P2005613-005	Water	10/1/2020	10:50	X	X
50WW12-201001	P2005613-006	Water	10/1/2020	11:40	X	X

PJ005613

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:** **14816**

SUBCONTRACT TO:

ALS Environmental
2655 Park Center Drive, Suite A
Simi Valley, CA 93065

Phone: +1 805 526 7161

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:	HS20100074
TSR:	Sonia West

	LAB SAMPLE ID / ANALYSIS REQUESTED	CLIENT SAMPLE ID	MATRIX	COLLECT DATE / DUE DATE
1.	**HS20100074-01**	**50WW14-201001**	**Groundwater**	**01 Oct 2020 07:55**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			09 Oct 2020
2.	**HS20100074-02**	**50WW13-201001**	**Groundwater**	**01 Oct 2020 09:05**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			09 Oct 2020
3.	**HS20100074-03**	**50WW11-201001**	**Groundwater**	**01 Oct 2020 09:55**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			09 Oct 2020
4.	**HS20100074-04**	**50WW11-201001-FD**	**Groundwater**	**01 Oct 2020 09:55**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			09 Oct 2020
5.	**HS20100074-05**	**50WW06-201001**	**Groundwater**	**01 Oct 2020 10:50**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			09 Oct 2020
6.	**HS20100074-06**	**50WW12-201001**	**Groundwater**	**01 Oct 2020 11:40**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			09 Oct 2020

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

HS20100074-01 MS/MSD

QC Level: DOD IV (DoD Data Package)

P2005C13

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense**

COC ID: **14816**

Relinquished By: [signature]

Date/Time: 10/5/2020 1800

Received By: [signature]

Date/Time: 10-6-20 1110

2° WET

Cooler ID(s):

Temperature(s):

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P2005613

Project: HS20100074

Sample(s) received on: 10/06/20 Date opened: 10/06/20 by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature: 2° C Blank Temperature: ° C	Wet Ic		
8	Were **custody seals** on outside of cooler/Box/Container?	☒	☐	☐
	Location of seal(s)? _____ Sealing Lid?	☒	☐	☐
	Were signature and date included?	☒	☐	☐
	Were seals intact?	☒	☐	☐
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☒	☐	☐
	Were **VOA vials** checked for presence/absence of air bubbles?	☒	☐	☐
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☒	☐
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2005613-001.01	40mL VOA NP		7		A	wh 10/13/20
P2005613-001.02	40mL VOA NP		7		A	wh 10/13/20
P2005613-001.03	40mL VOA NP		7		A	wh 10/13/20
P2005613-001.04	40ml VOA HCL		1		A	wh 10/13/20
P2005613-001.05	40ml VOA HCL		1		A	wh 10/13/20
P2005613-001.06	40ml VOA HCL		1		A	wh 10/13/20
P2005613-001.07	40mL VOA NP				A	
P2005613-001.08	40mL VOA NP				A	
P2005613-001.09	40mL VOA NP				A	
P2005613-001.10	40mL VOA NP				A	
P2005613-001.11	40mL VOA NP				A	
P2005613-001.12	40mL VOA NP				A	
P2005613-001.13	40ml VOA HCL				A	
P2005613-001.14	40ml VOA HCL				A	
P2005613-001.15	40ml VOA HCL				A	

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P2005613

Project: HS20100074

Sample(s) received on: 10/06/20 Date opened: 10/06/20 by: ADAVID

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2005613-001.16	40ml VOA HCL				A	
P2005613-001.17	40ml VOA HCL				A	
P2005613-001.18	40ml VOA HCL				A	
P2005613-002.01	40mL VOA NP		7		A	wh 10/13/20
P2005613-002.02	40mL VOA NP				A	
P2005613-002.03	40mL VOA NP				A	
P2005613-002.04	40ml VOA HCL		1		A	wh 10/13/20
P2005613-002.05	40ml VOA HCL				A	
P2005613-002.06	40ml VOA HCL				A	
P2005613-003.01	40mL VOA NP		7		A	wh 10/13/20
P2005613-003.02	40mL VOA NP				A	
P2005613-003.03	40mL VOA NP				A	
P2005613-003.04	40ml VOA HCL		1		A	wh 10/13/20
P2005613-003.05	40ml VOA HCL				A	
P2005613-003.06	40ml VOA HCL				A	
P2005613-004.01	40mL VOA NP		7		A	wh 10/13/20
P2005613-004.02	40mL VOA NP				A	
P2005613-004.03	40mL VOA NP				A	
P2005613-004.04	40ml VOA HCL		1		A	wh 10/13/20
P2005613-004.05	40ml VOA HCL				A	
P2005613-004.06	40ml VOA HCL				A	
P2005613-005.01	40mL VOA NP		7		A	wh 10/13/20
P2005613-005.02	40mL VOA NP				A	
P2005613-005.03	40mL VOA NP				A	
P2005613-005.04	40ml VOA HCL		1		A	wh 10/13/20
P2005613-005.05	40ml VOA HCL				A	
P2005613-005.06	40ml VOA HCL				A	
P2005613-006.01	40mL VOA NP		7		A	wh 10/13/20
P2005613-006.02	40mL VOA NP				A	
P2005613-006.03	40mL VOA NP				A	
P2005613-006.04	40ml VOA HCL		1		A	wh 10/13/20
P2005613-006.05	40ml VOA HCL				A	
P2005613-006.06	40ml VOA HCL				A	

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Project ID: **HS20100074** ALS Project ID: P2005613

Carbon Dioxide

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Wade Henton
Matrix: Liquid
Test Notes:

Date(s) Collected: 10/1/20
Date Received: 10/6/20
Date Analyzed: 10/13/20

Client Sample ID	ALS Sample ID	Injection Volume ml(s)	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
50WW14-201001	P2005613-001	0.10	**170,000**	1,000	860	370	
50WW13-201001	P2005613-002	0.10	**310,000**	1,000	860	370	
50WW11-201001	P2005613-003	0.10	**74,000**	1,000	860	370	
50WW11-201001-FD	P2005613-004	0.10	**79,000**	1,000	860	370	
50WW06-201001	P2005613-005	0.10	**93,000**	1,000	860	370	
50WW12-201001	P2005613-006	0.10	**140,000**	1,000	860	370	
Method Control Sample	P201013-MB	0.10	860	1,000	860	370	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample** ALS Project ID: P2005613
Client Project ID: **HS20100074** ALS Sample ID: P201013-DLCS

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/TCD Date Received: NA
Analyst: Wade Henton Date Analyzed: 10/13/20
Matrix: Liquid Volume(s) Analyzed: NA ml(s)
Test Notes:

CAS #	Compound	Spike Amount LCS / DLCS ug/L	Result$_1$ LCS ug/L	Result$_1$ DLCS ug/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
124-38-9	Carbon Dioxide	22,900	21,700	21,300	**95**	**93**	80-122	2	12	

$_1$ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW14-201001**
Client Project ID: **HS20100074**

ALS Project ID: P2005613
ALS Sample ID: P2005613-001

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: 10/01/20
Date Received: 10/06/20
Date Analyzed: 10/08/20
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**2.2**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW13-201001**
Client Project ID: **HS20100074**

ALS Project ID: P2005613
ALS Sample ID: P2005613-002

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: 10/01/20
Date Received: 10/06/20
Date Analyzed: 10/08/20
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**4.2**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW11-201001**
Client Project ID: **HS20100074**

ALS Project ID: P2005613
ALS Sample ID: P2005613-003

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: 10/01/20
Date Received: 10/06/20
Date Analyzed: 10/08/20
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**4.6**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW11-201001-FD** ALS Project ID: P2005613
Client Project ID: **HS20100074** ALS Sample ID: P2005613-004

Test Code: RSK 175 Date Collected: 10/01/20
Instrument ID: HP5890A/GC10/FID Date Received: 10/06/20
Analyst: Wade Henton Date Analyzed: 10/08/20
Matrix: Water Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**5.1**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW06-201001**
Client Project ID: **HS20100074**

ALS Project ID: P2005613
ALS Sample ID: P2005613-005

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: 10/01/20
Date Received: 10/06/20
Date Analyzed: 10/08/20
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**3.8**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW12-201001**
Client Project ID: **HS20100074**

ALS Project ID: P2005613
ALS Sample ID: P2005613-006

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: 10/01/20
Date Received: 10/06/20
Date Analyzed: 10/08/20
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**0.83**	1.3	1.0	0.51	**J**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **Method Control Sample** ALS Project ID: P2005613
Client Project ID: **HS20100074** ALS Sample ID: P201008-MB

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/FID Date Received: NA
Analyst: Wade Henton Date Analyzed: 10/08/20
Matrix: Water Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	**U**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

MATRIX SPIKE / DUPLICATE MATRIX SPIKE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **50WW14-201001**
Client Project ID: **HS20100074**

ALS Project ID: P2005613
ALS Sample ID: P2005613-001MS
P2005613-001DMS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: 10/1/20
Date Received: 10/6/20
Date Analyzed: 10/8/20
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount MS / DMS µg/L	Sample Amount µg/L	Result MS µg/L	Result DMS µg/L	% Recovery MS	% Recovery DMS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	169	2.17	137	137	**80**	**80**	73-125	0	30	
74-85-1	Ethene	294	ND	293	290	**100**	**99**	72-133	1	30	
74-84-0	Ethane	317	ND	274	273	**86**	**86**	74-131	0	30	

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **HS20100074**

ALS Project ID: P2005613
ALS Sample ID: P201008-LCS
P201008-DLCS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 10/08/20
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount LCS / DLCS µg/L	Result$_1$ LCS µg/L	Result$_1$ DLCS µg/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	2.52	2.81	2.57	**112**	**102**	73-125	9	26	
74-85-1	Ethene	4.40	5.42	5.05	**123**	**115**	72-133	7	11	
74-84-0	Ethane	4.72	5.00	4.75	**106**	**101**	74-131	5	10	

$_1$ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132009.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 15:13:31
Operator : WH
Sample : P2005613-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 15:29:00 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

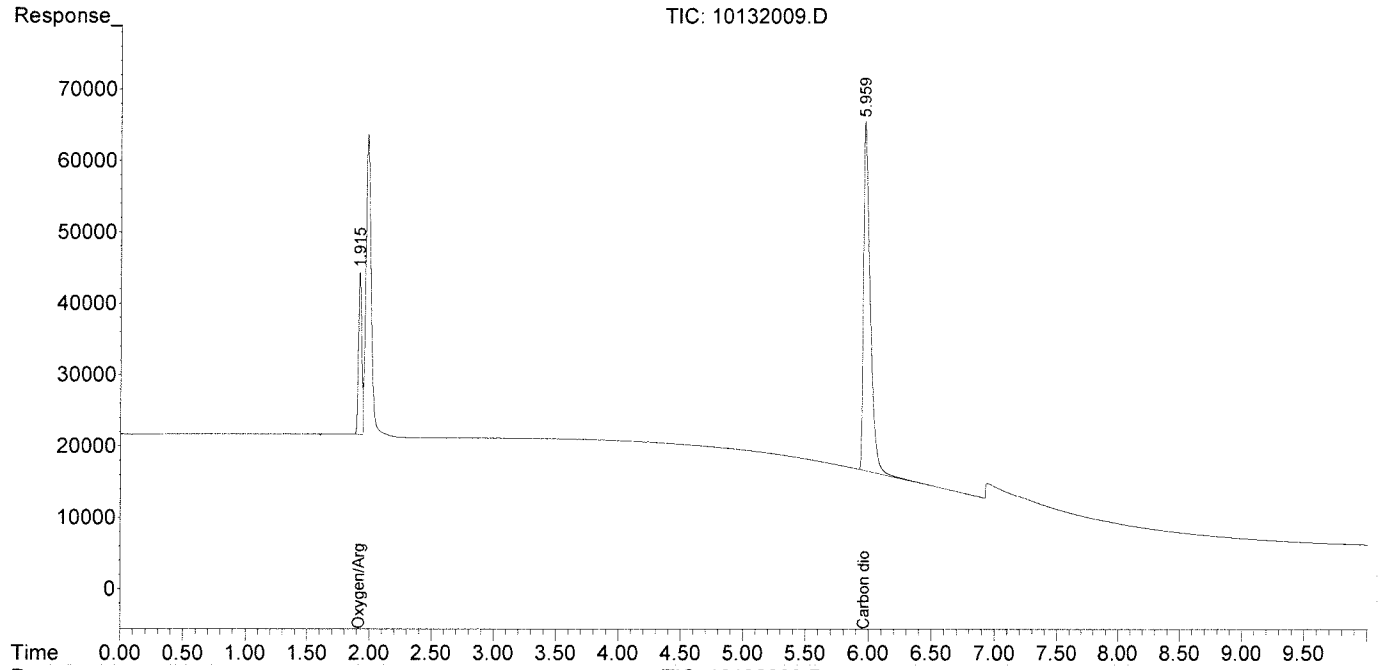
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.916f	402515	0.085	ppm
2)	Carbon monoxide	1.916f	402515	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.960	1842922	7851.271	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

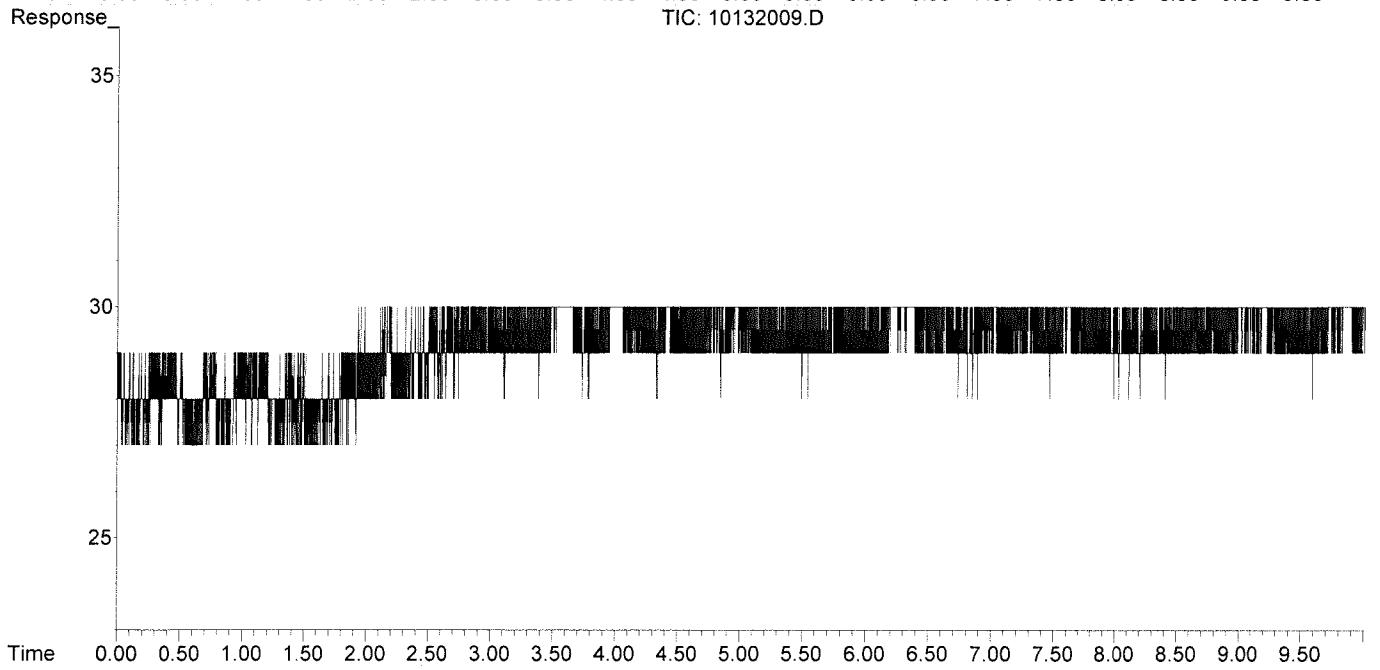
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132009.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 15:13:31
Operator : WH
Sample : P2005613-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 15:29:00 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132010.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 15:27:19
Operator : WH
Sample : P2005613-001ms 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 15:41:51 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

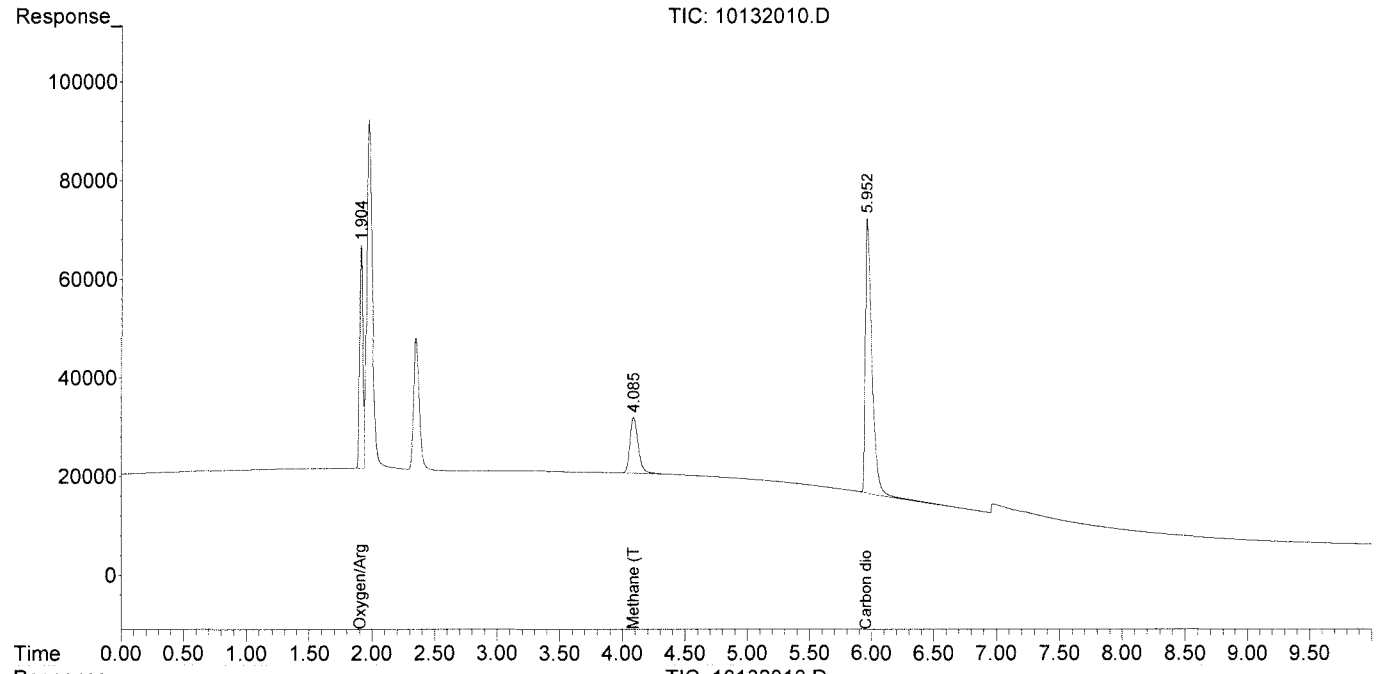
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.905f	780689	0.164	ppm
2)	Carbon monoxide	1.905	780689	N.D.	ppm
3)	Methane (TCD)	4.085f	512932	54236.339	ppm
4)	Carbon dioxide	5.953	2139425	9114.439	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

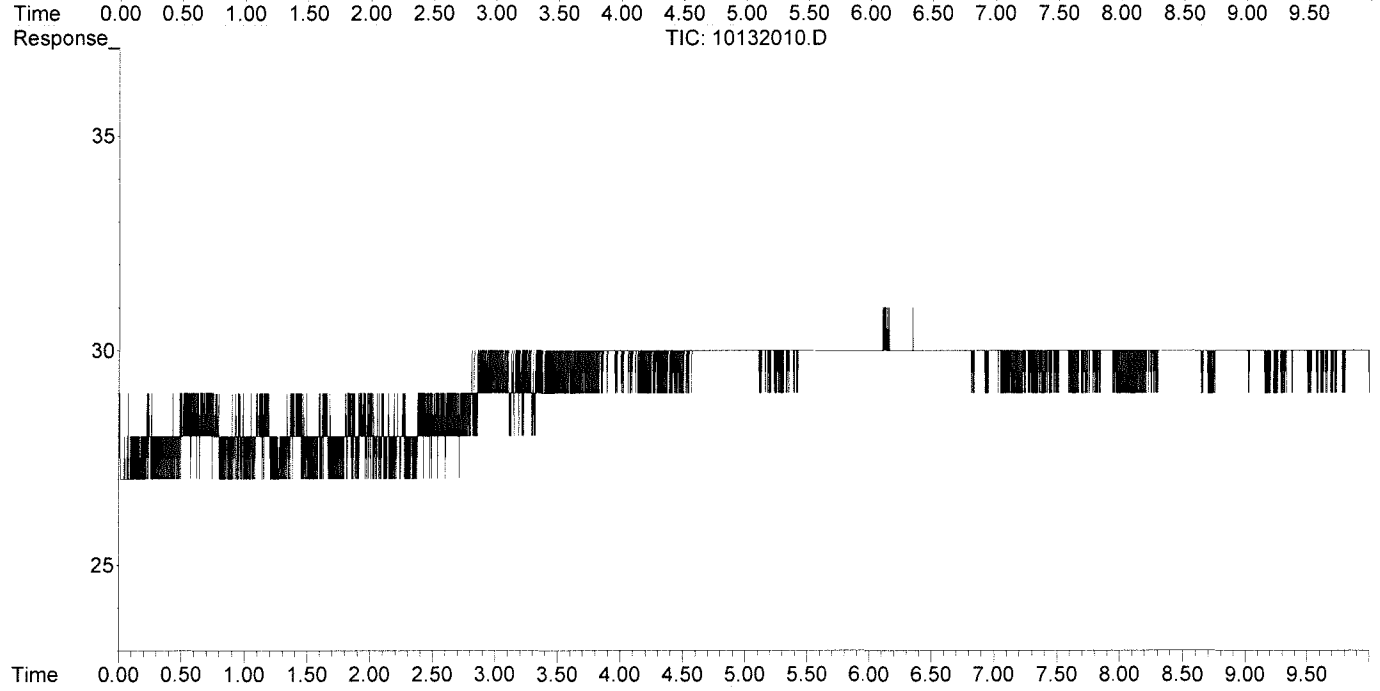
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132010.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 15:27:19
Operator : WH
Sample : P2005613-001ms 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 15:41:51 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132011.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 15:42:42
Operator : WH
Sample : P2005613-001msd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 15:53:30 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

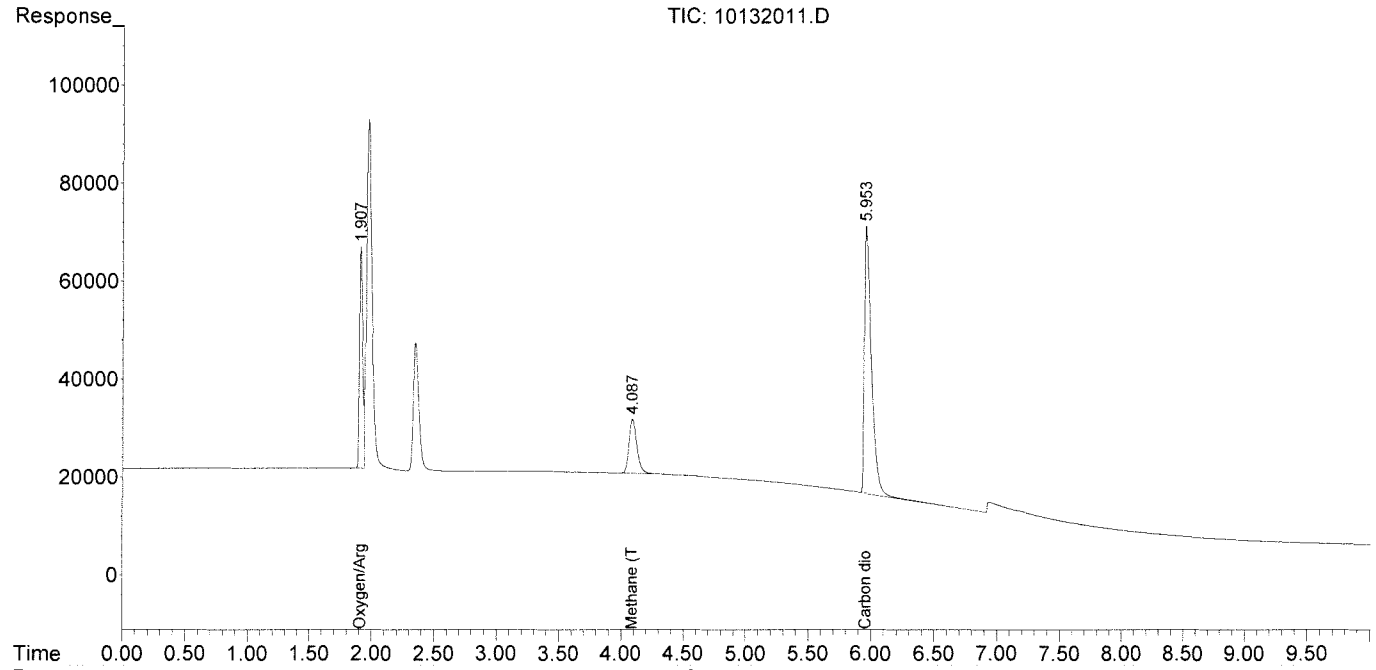
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.908f	781986	0.164	ppm
2)	Carbon monoxide	1.908f	781986	N.D.	ppm
3)	Methane (TCD)	4.088f	499592	52825.829	ppm
4)	Carbon dioxide	5.954	2124816	9052.203	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

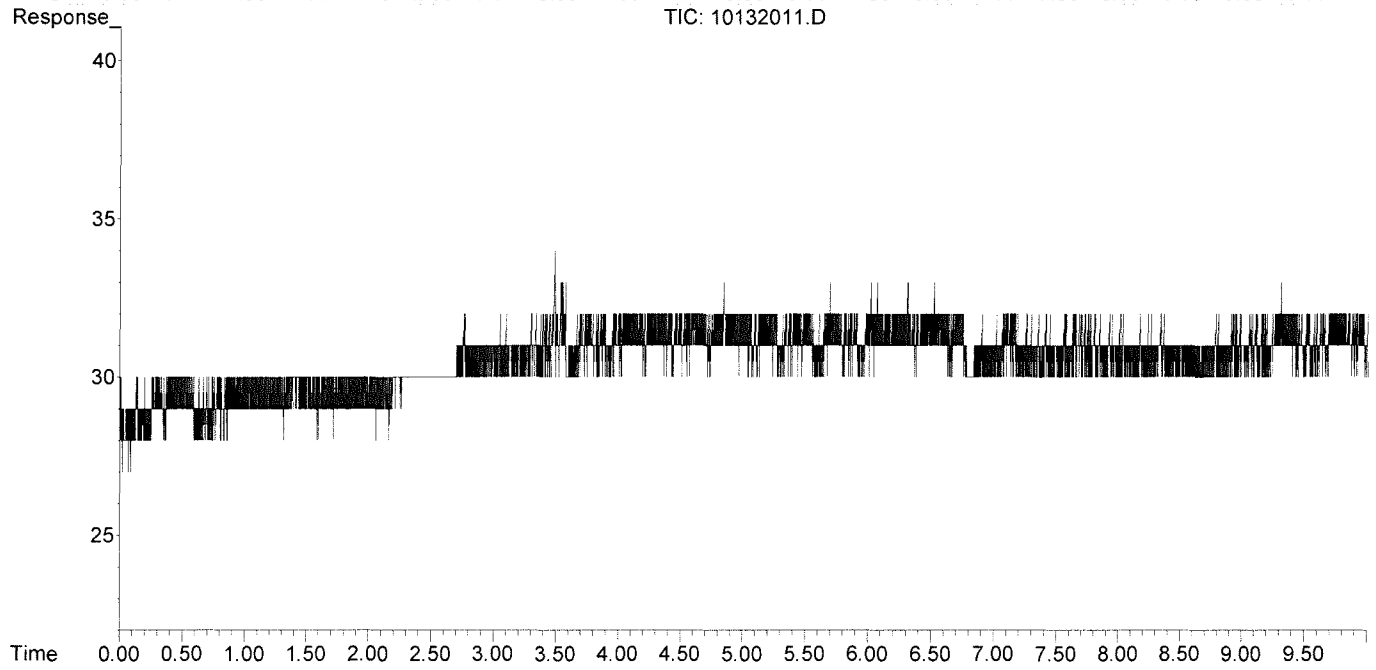
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132011.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 15:42:42
Operator : WH
Sample : P2005613-001msd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 15:53:30 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132004.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 13:22:16
Operator : WH
Sample : P2005613-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 13:37:43 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

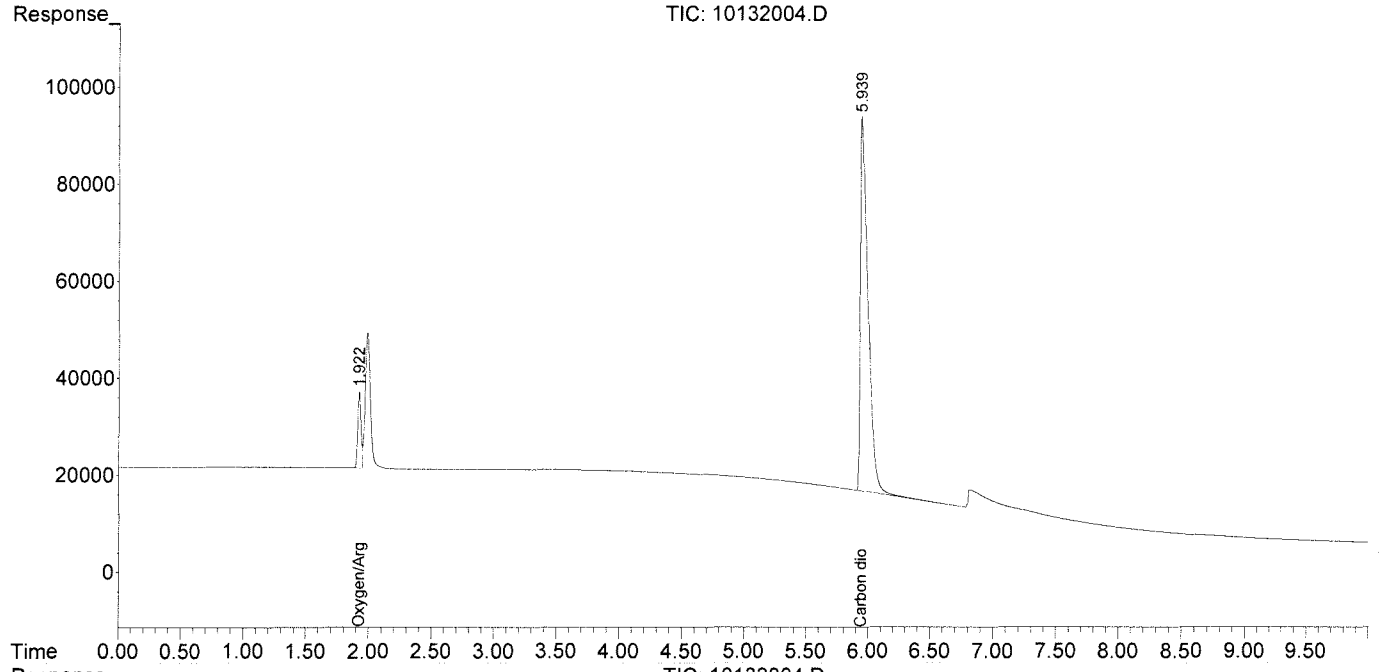
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.922f	285375	0.060	ppm
2)	Carbon monoxide	1.922f	285375	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.940	3322652	14155.258	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

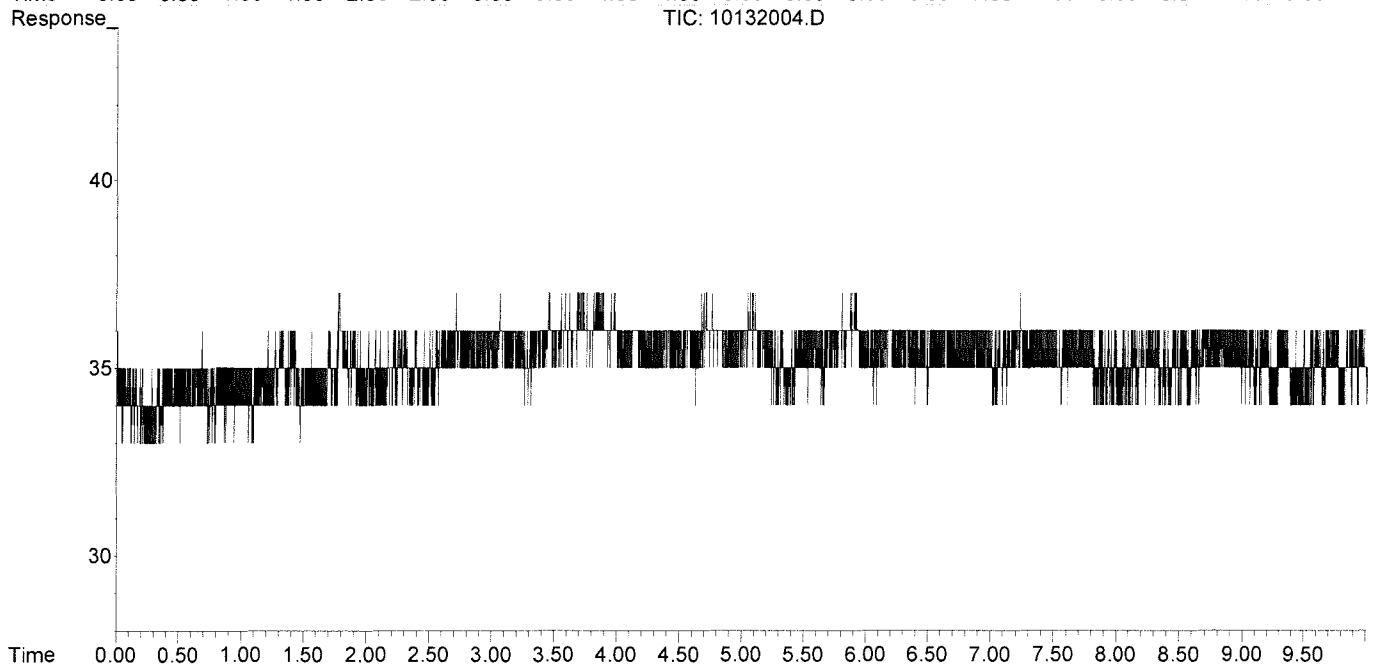
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132004.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 13:22:16
Operator : WH
Sample : P2005613-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 13:37:43 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132005.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 13:37:18
Operator : WH
Sample : P2005613-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 14:50:44 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

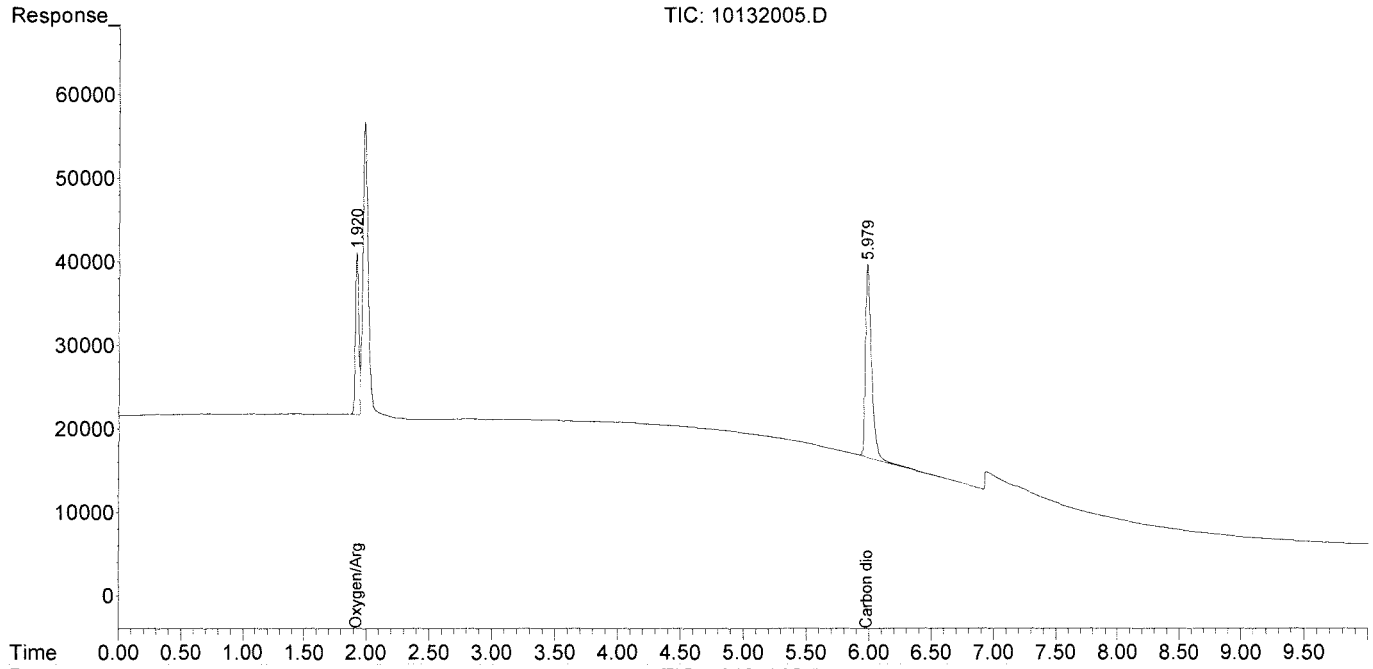
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.920f	347915	0.073	ppm
2)	Carbon monoxide	1.920f	347915	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.979	799693	3406.875	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

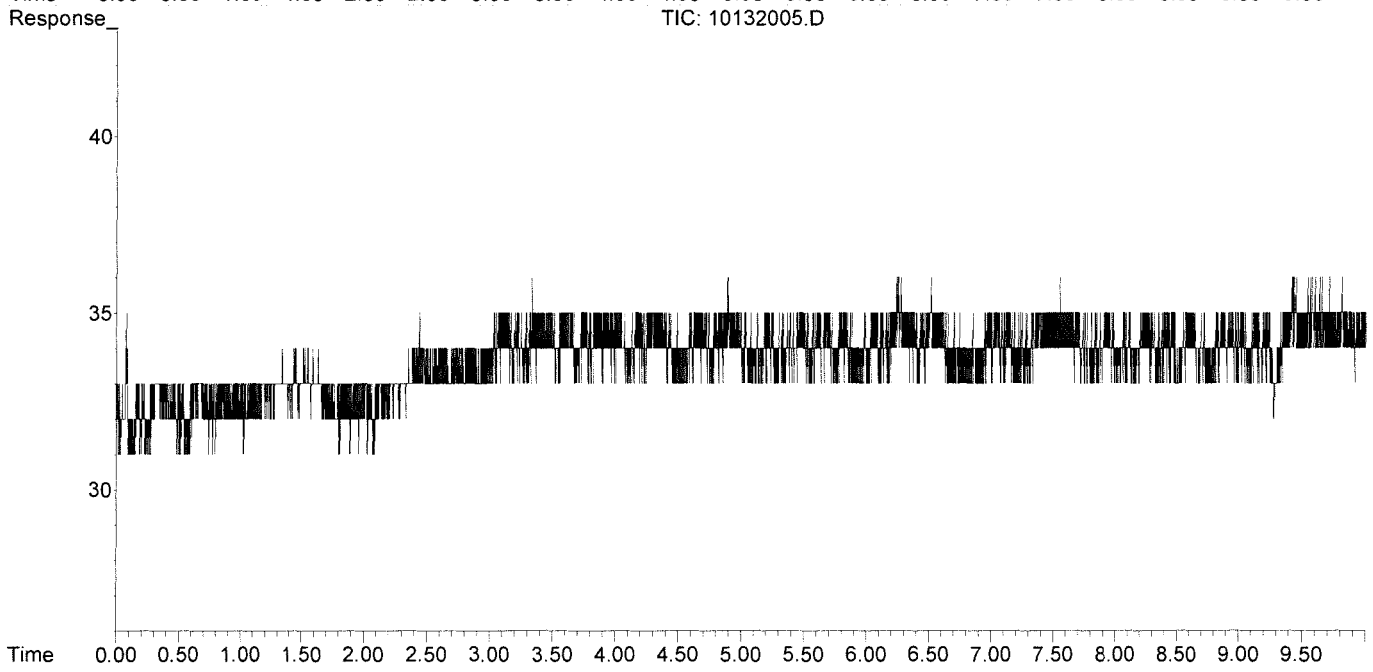
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132005.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 13:37:18
Operator : WH
Sample : P2005613-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 14:50:44 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132006.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 14:00:18
Operator : WH
Sample : P2005613-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 14:51:03 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

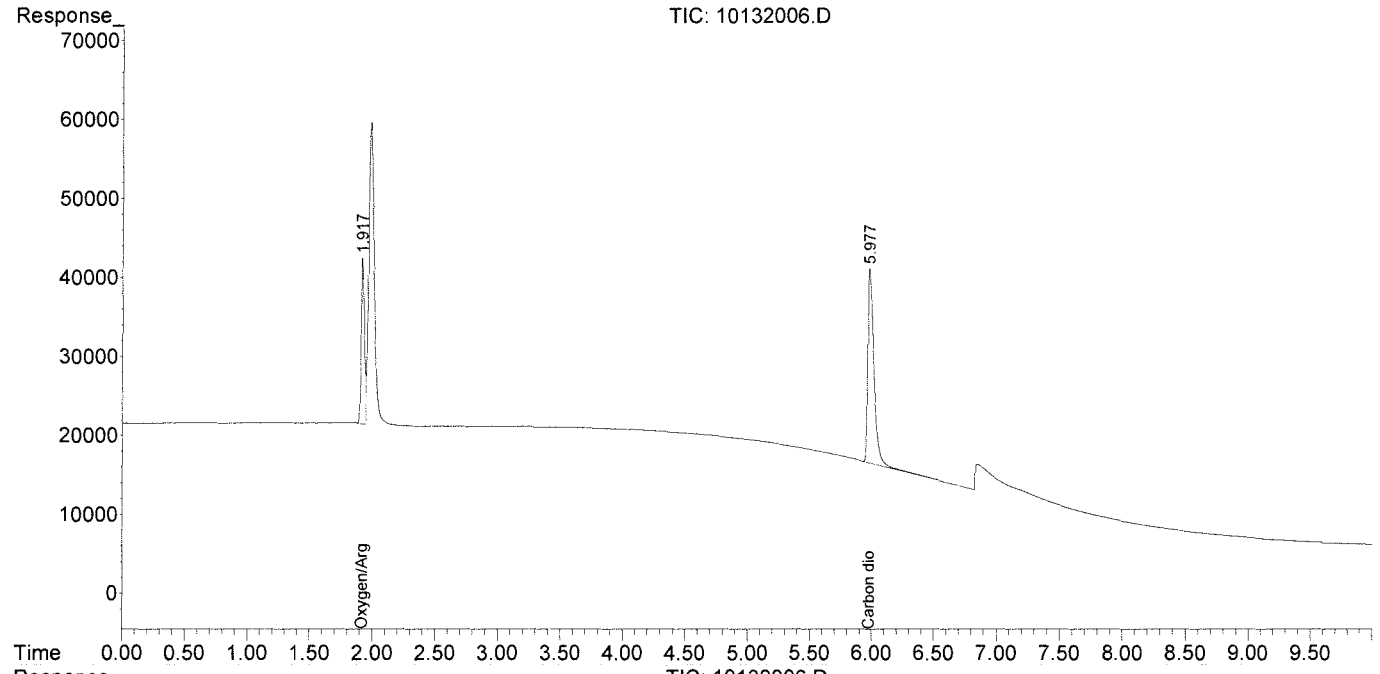
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.918f	376393	0.079	ppm
2)	Carbon monoxide	1.918f	376393	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.978	852843	3633.306	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

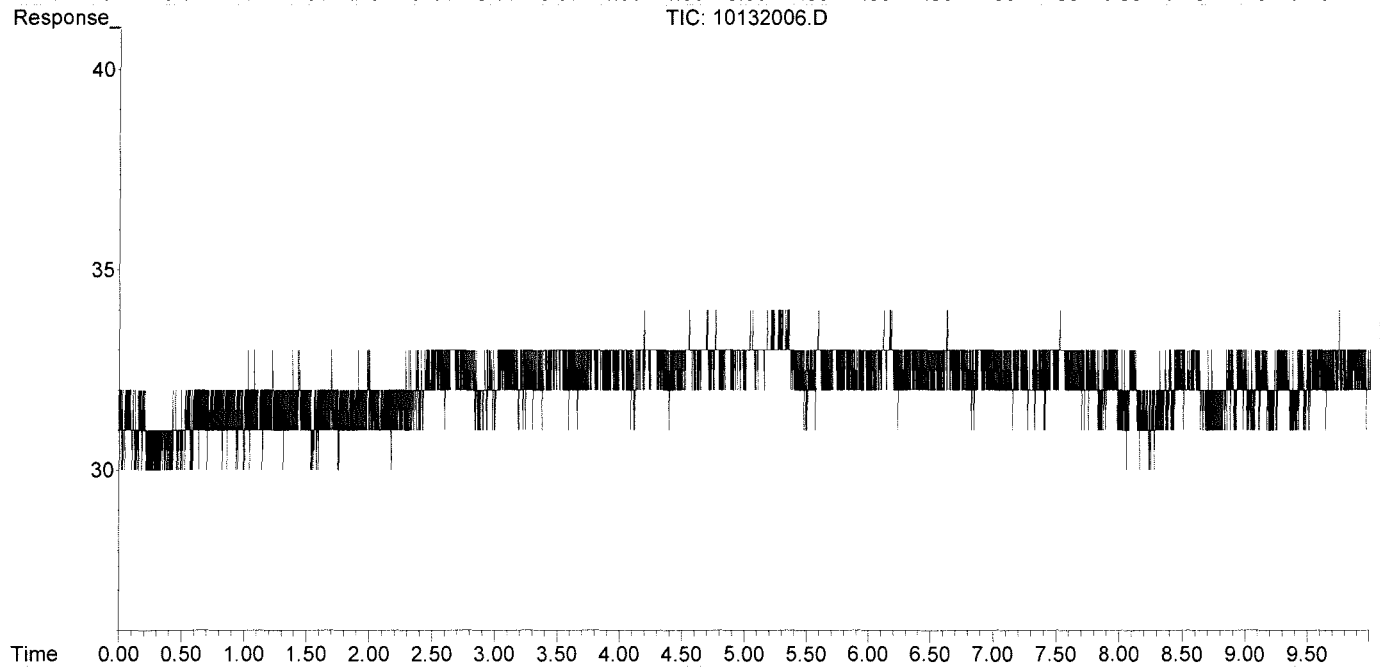
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132006.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 14:00:18
Operator : WH
Sample : P2005613-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 14:51:03 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132007.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 14:44:17
Operator : WH
Sample : P2005613-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 14:51:19 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

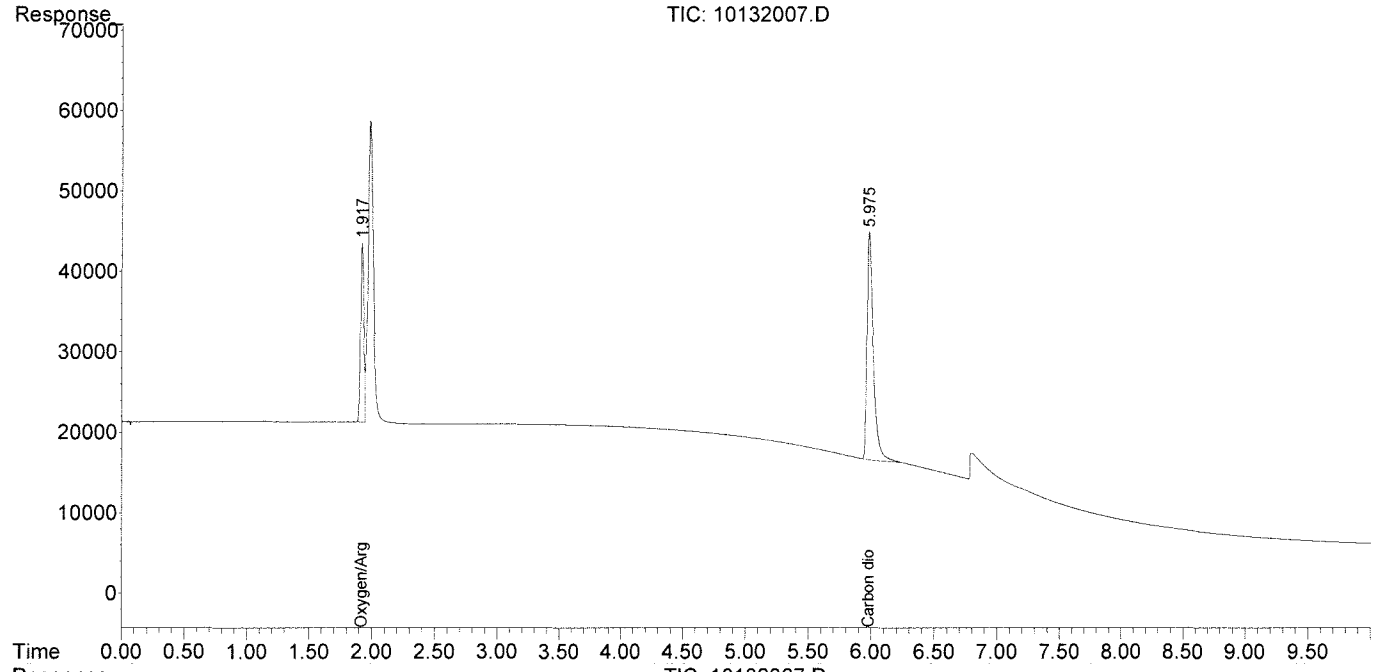
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.917f	399802	0.084	ppm	
2)	Carbon monoxide	1.917f	399802	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	5.975	1003744	4276.179	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

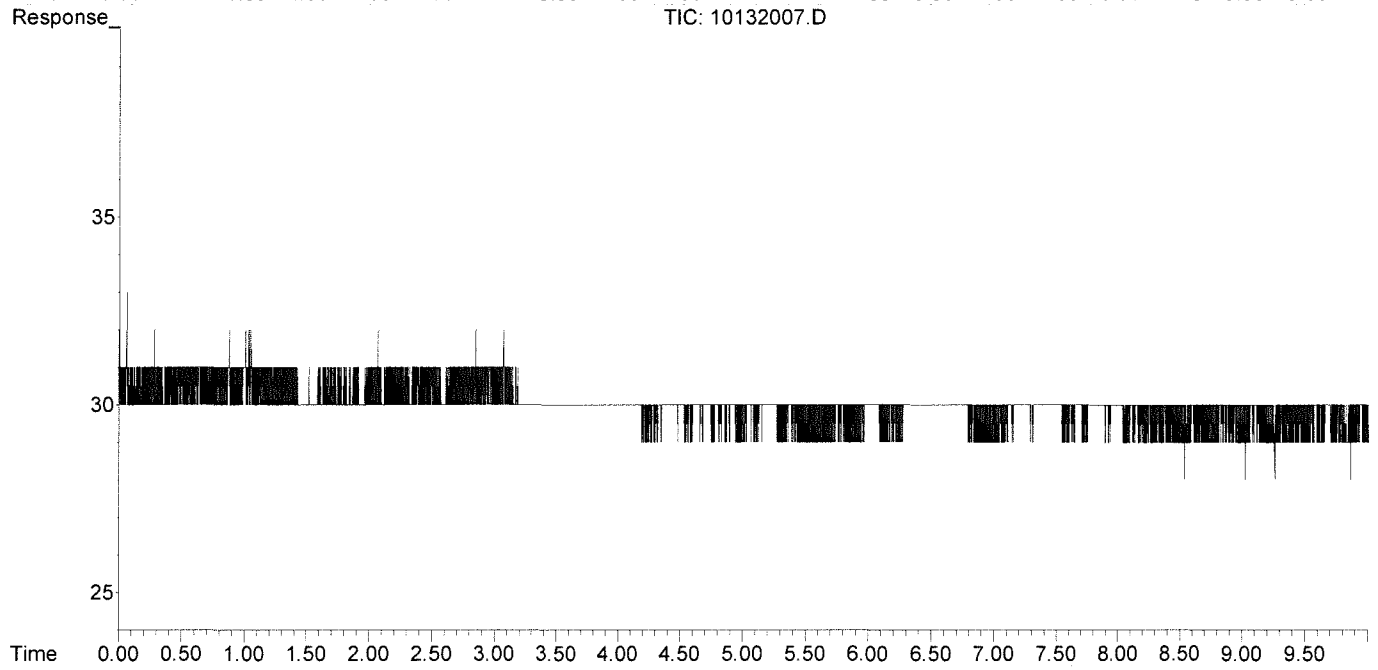
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132007.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 14:44:17
Operator : WH
Sample : P2005613-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 14:51:19 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

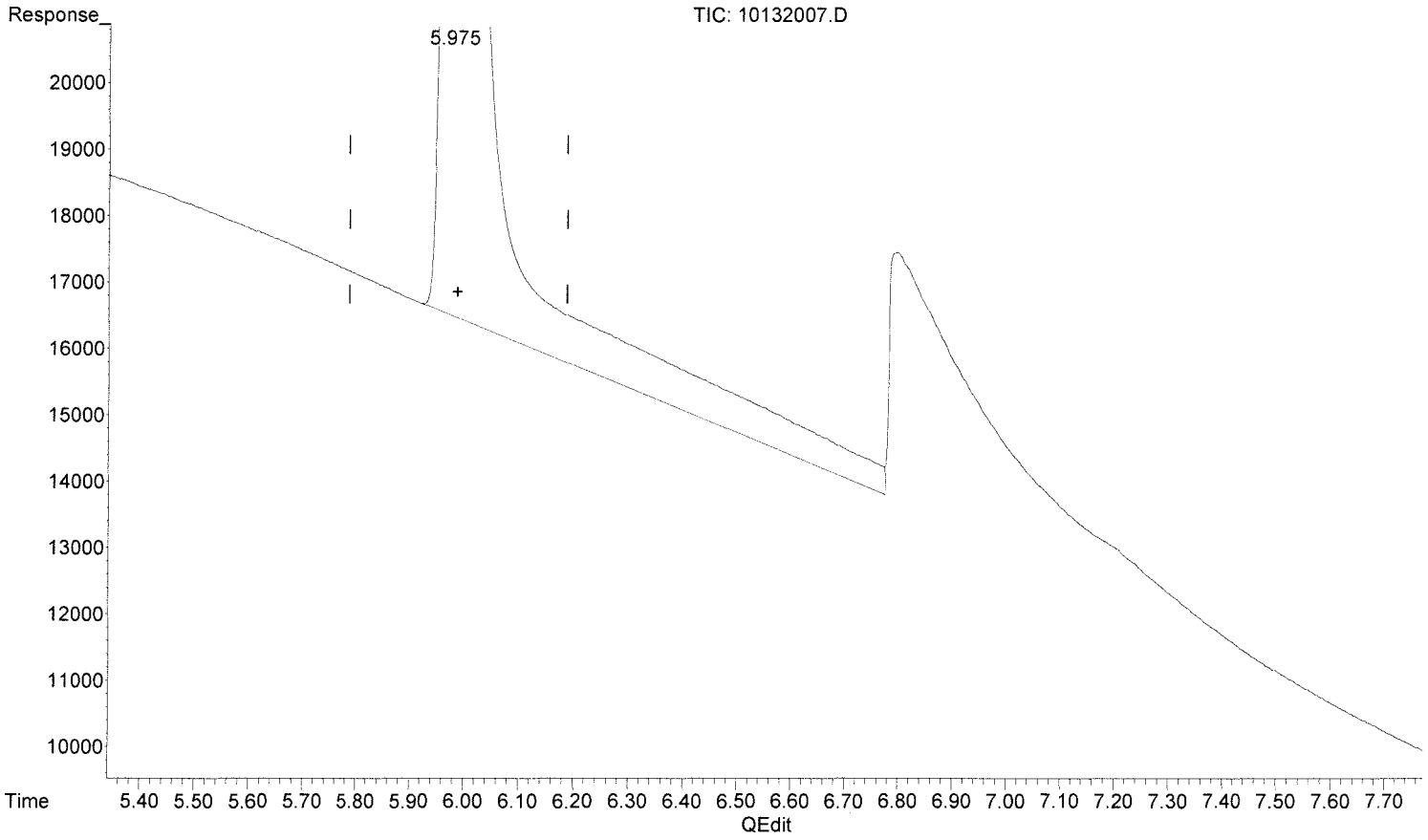




Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132007.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 14:44:17
Operator : WH
Sample : P2005613-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 14:51:19 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.976min 5300.943 ppm

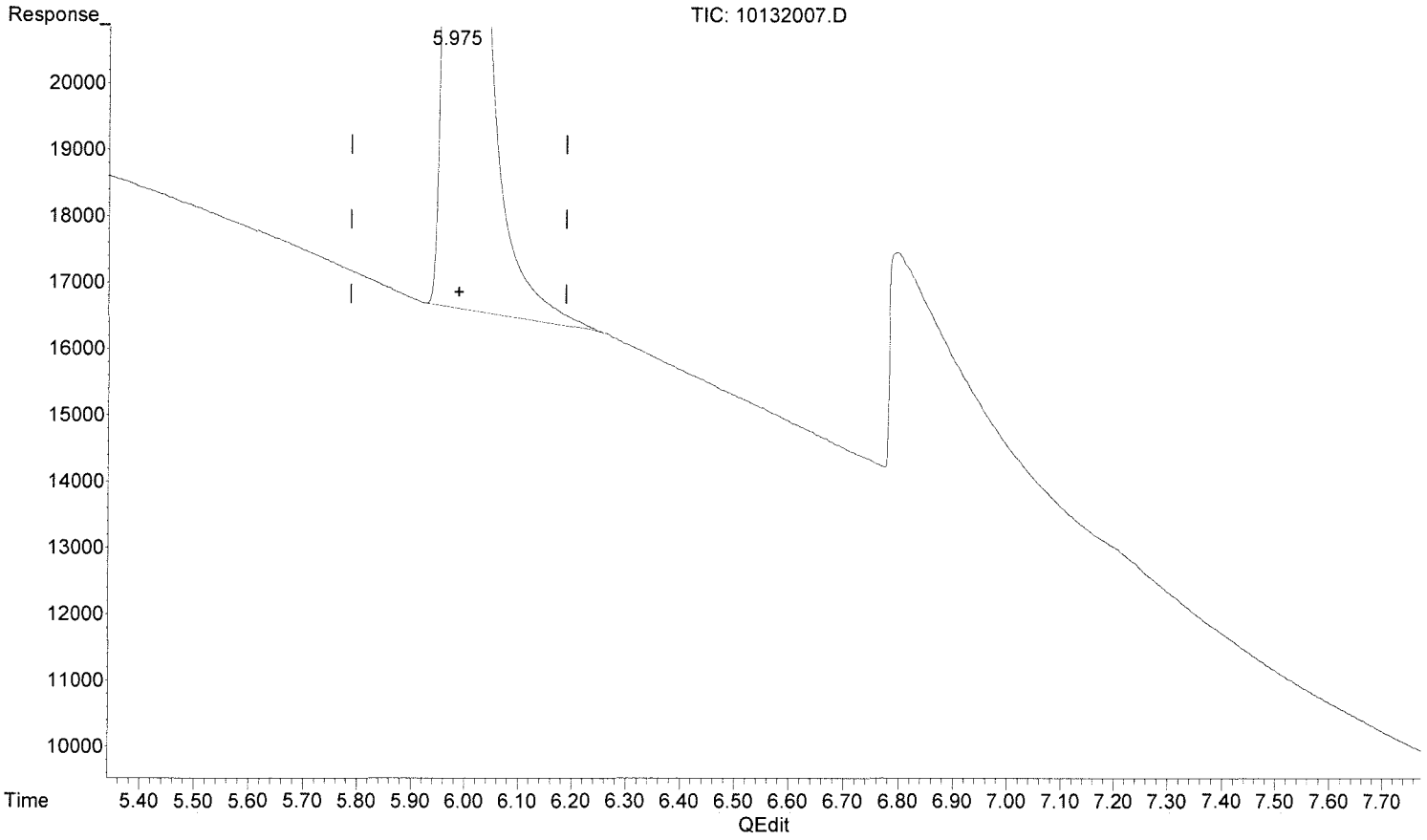
response 1244286

(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132007.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 14:44:17
Operator : WH
Sample : P2005613-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 14:51:19 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.975min 4276.179 ppm m

response 1003744

MR 10/14/20

10/14/20 BLC

(+) = Expected Retention Time
RS082817_CO2.M Wed Oct 14 14:51:42 2020 Page: 1

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132008.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 14:57:51
Operator : WH
Sample : P2005613-006 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 14:51:56 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

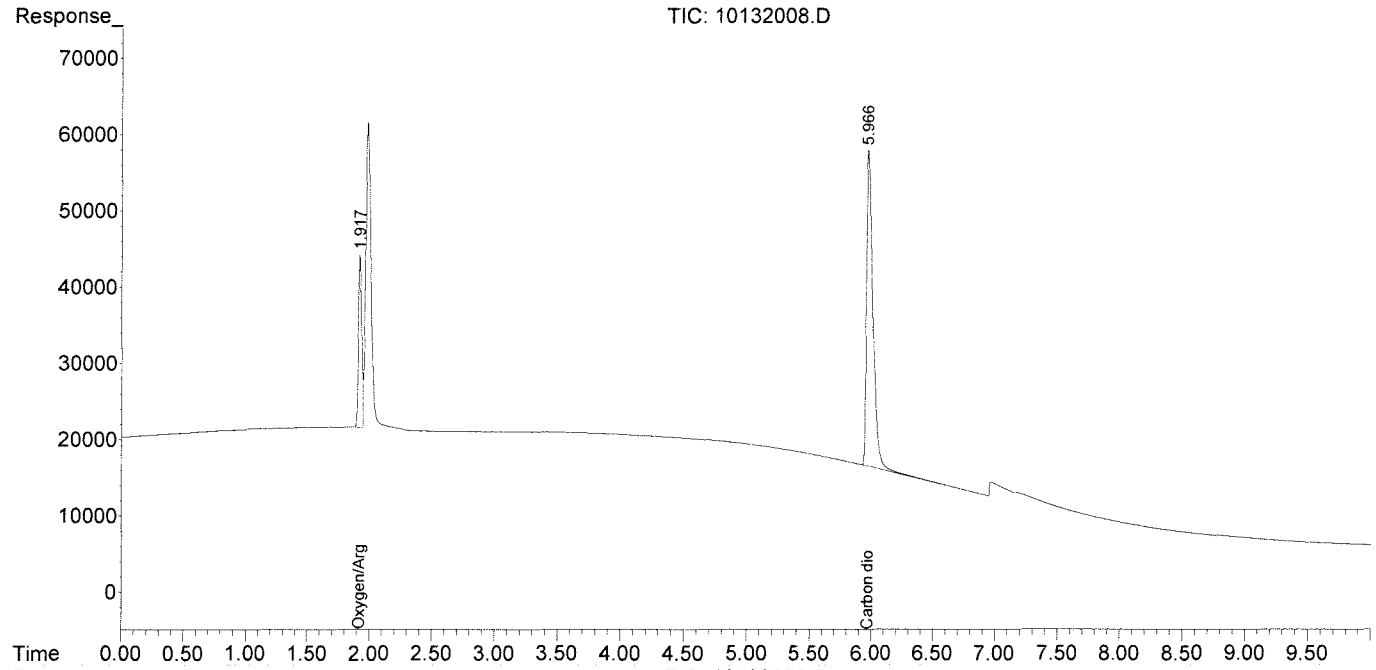
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.918f	402875	0.085	ppm
2)	Carbon monoxide	1.918f	402875	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.967	1500033	6390.483	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

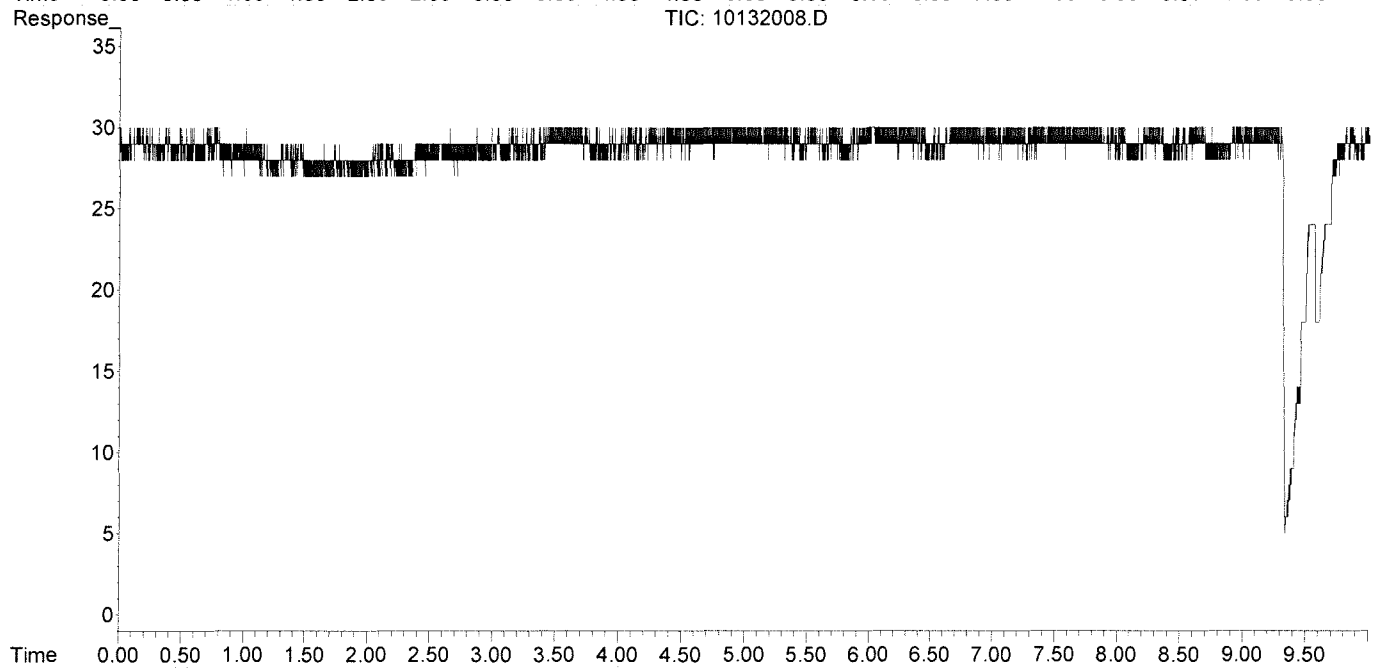
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132008.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 14:57:51
Operator : WH
Sample : P2005613-006 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 14:51:56 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132003.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 12:55:09
Operator : WH
Sample : mcs 01ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 13:21:10 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

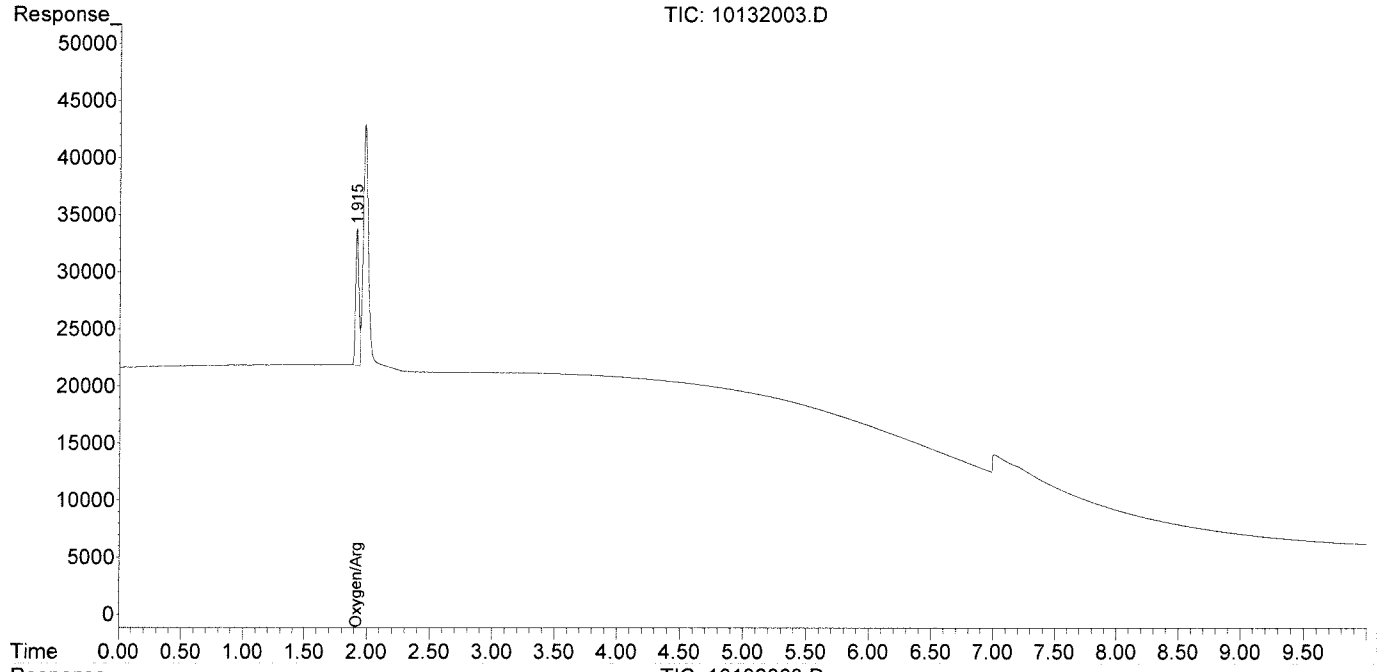
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.916f	217604	0.046	ppm
2)	Carbon monoxide	1.916f	217604	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

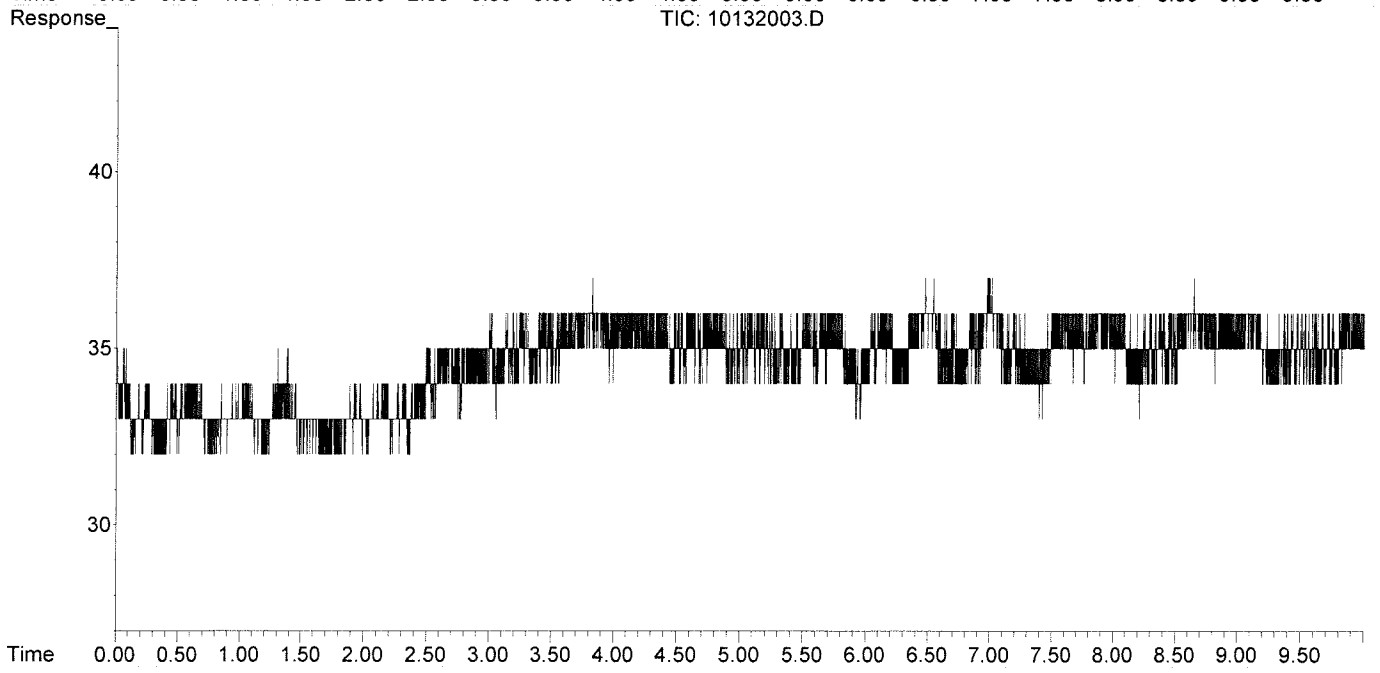
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132003.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 12:55:09
Operator : WH
Sample : mcs 01ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 13:21:10 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132012.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 15:56:01
Operator : WH
Sample : tcd lcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 16:08:23 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

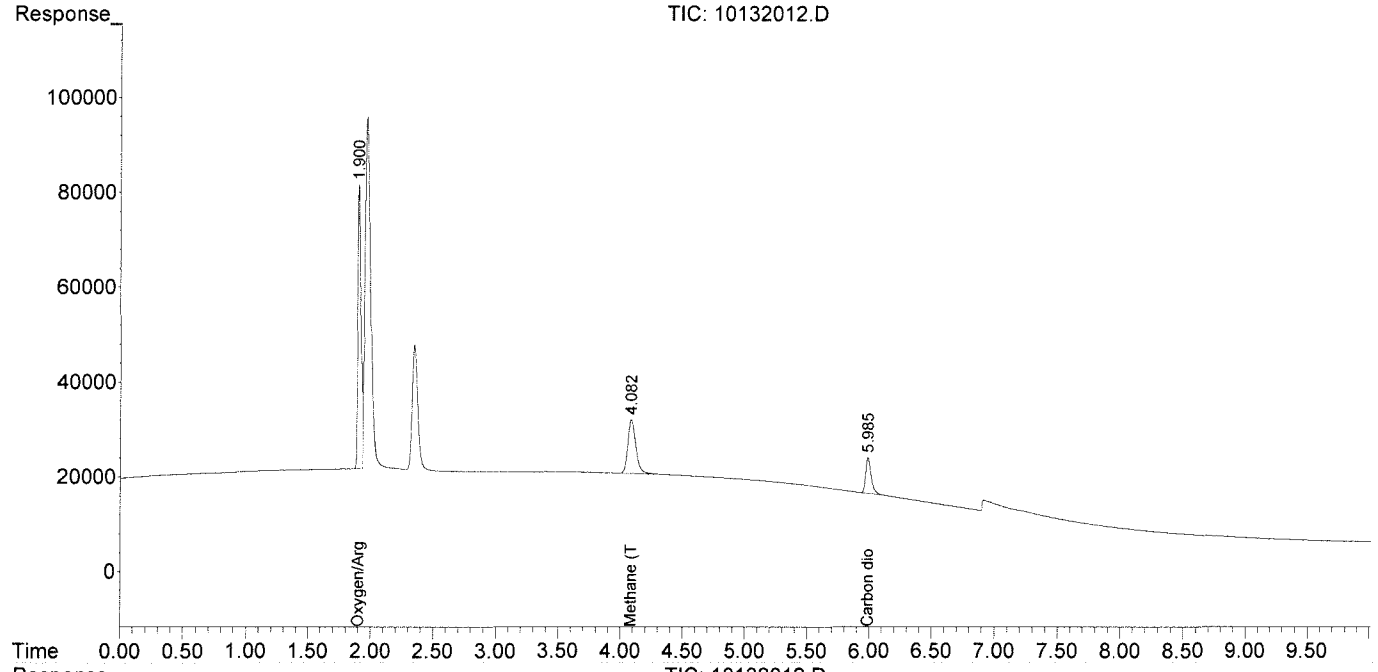
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.901	1067362	0.224	ppm	
2)	Carbon monoxide	1.901	1067362	N.D.	ppm	
3)	Methane (TCD)	4.083f	515896	54549.690	ppm	
4)	Carbon dioxide	5.985	233596	995.171	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

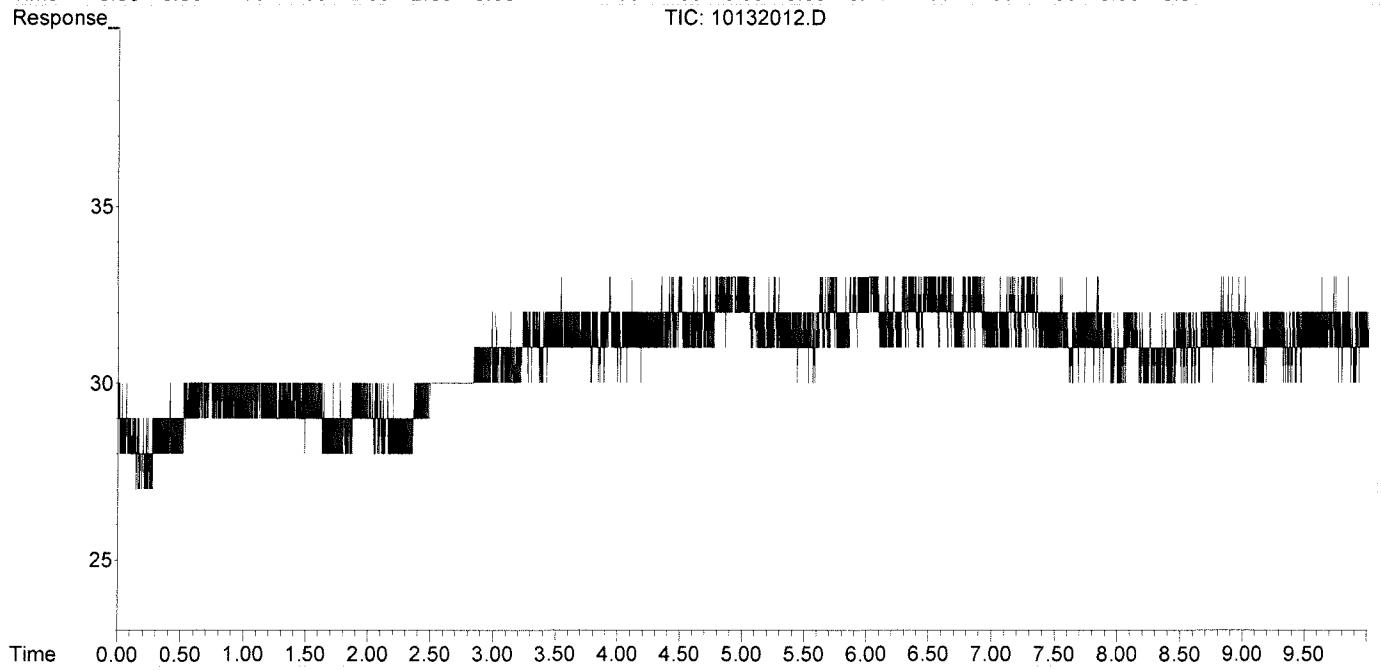
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132012.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 15:56:01
Operator : WH
Sample : tcd lcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 16:08:23 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

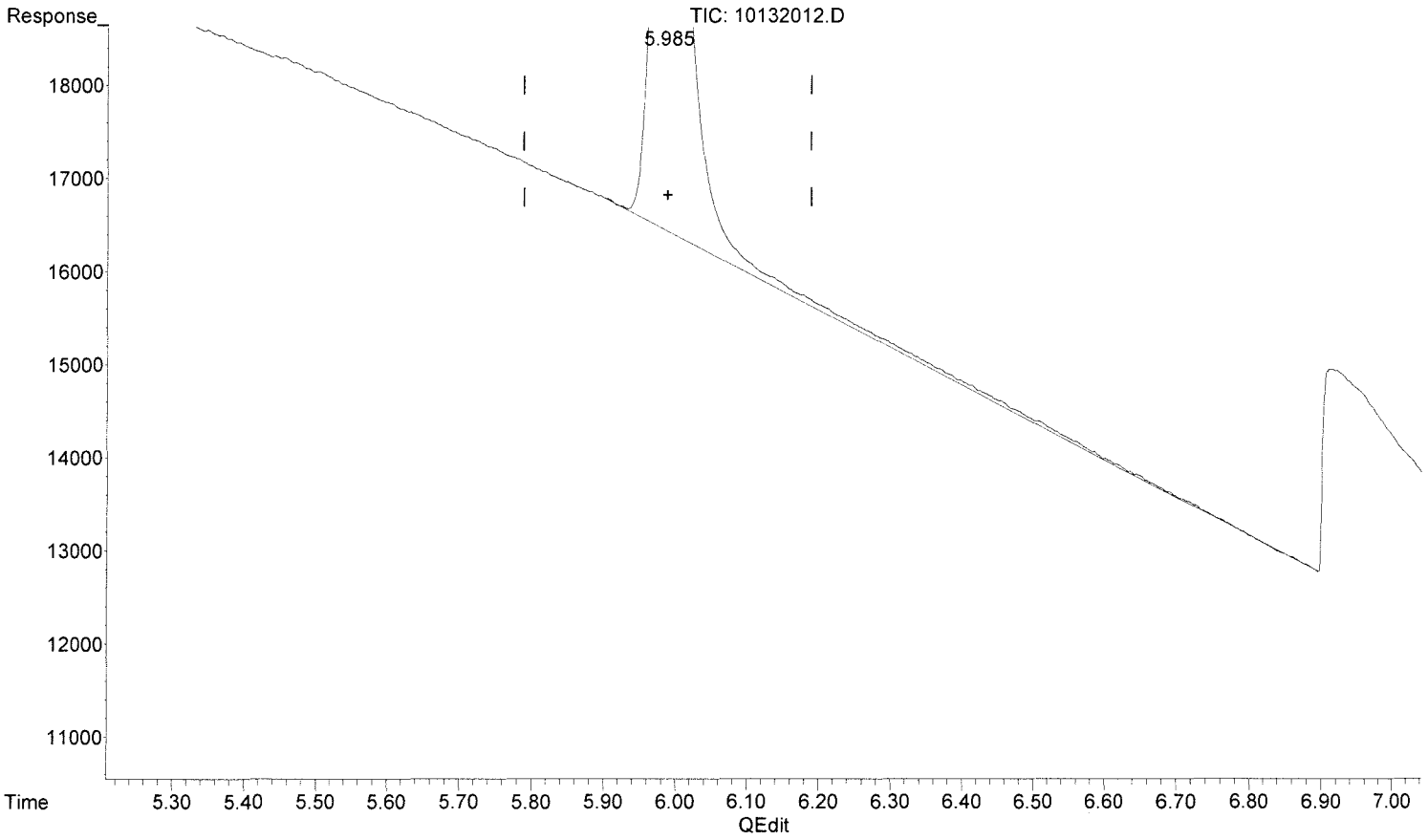




Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132012.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 15:56:01
Operator : WH
Sample : tcd lcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 16:08:23 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.985min 1086.572 ppm

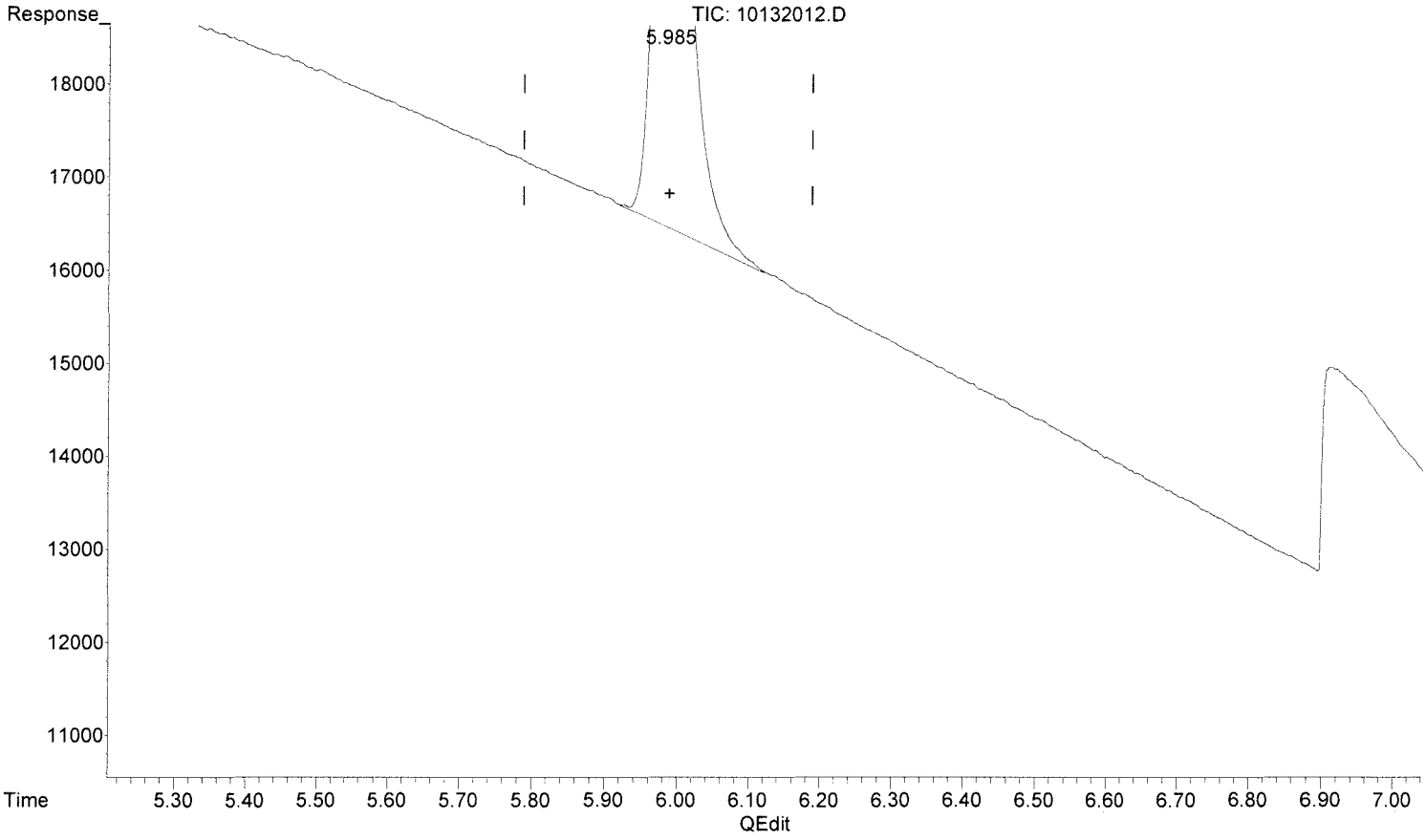
response 255050

(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132012.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 15:56:01
Operator : WH
Sample : tcd lcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 16:08:23 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.985min 995.171 ppm m

response 233596

MR 10/14/20

(+) = Expected Retention Time
RS082817_CO2.M Wed Oct 14 14:53:02 2020 Page: 1

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132013.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 16:09:44
Operator : WH
Sample : tcd lcsd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 16:32:34 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.899	1104471	0.232	ppm	
2)	Carbon monoxide	1.899	1104471	N.D.	ppm	
3)	Methane (TCD)	4.084f	506642	53571.266	ppm	
4)	Carbon dioxide	5.985	228991	975.556	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

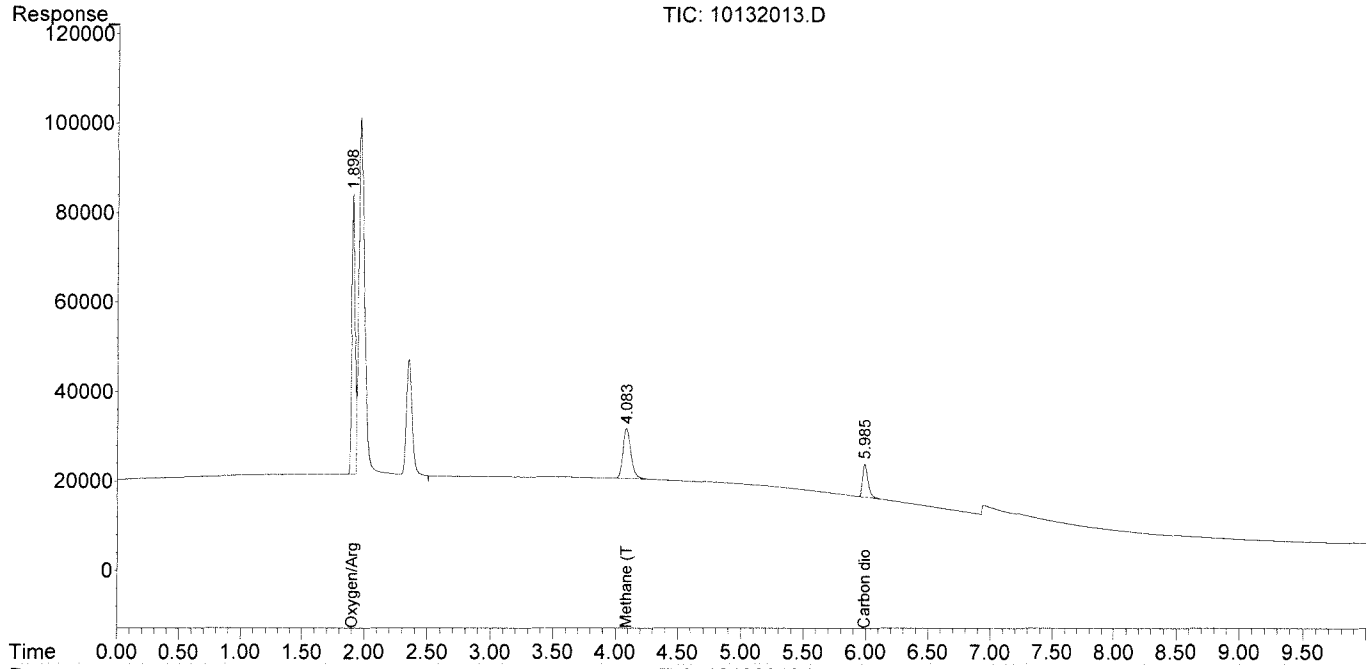
(f)=RT Delta > 1/2 Window (m)=manual int.

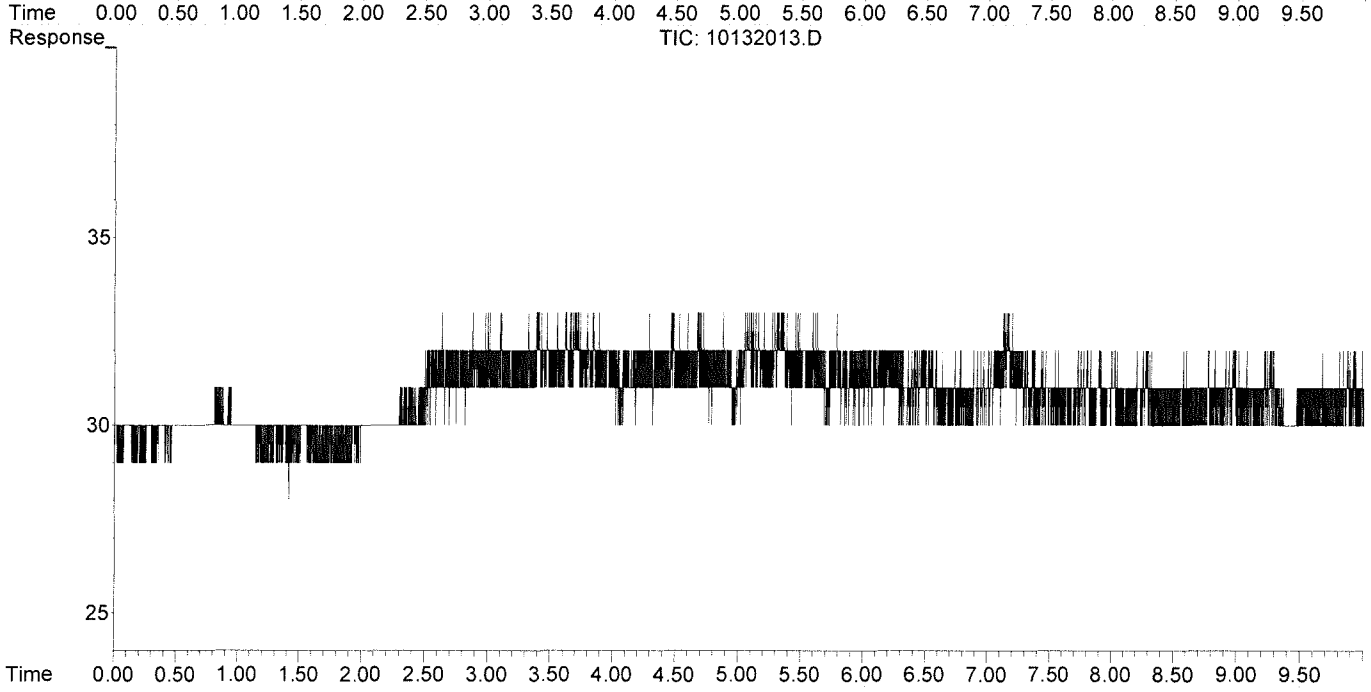
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132013.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 16:09:44
Operator : WH
Sample : tcd lcsd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 16:32:34 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



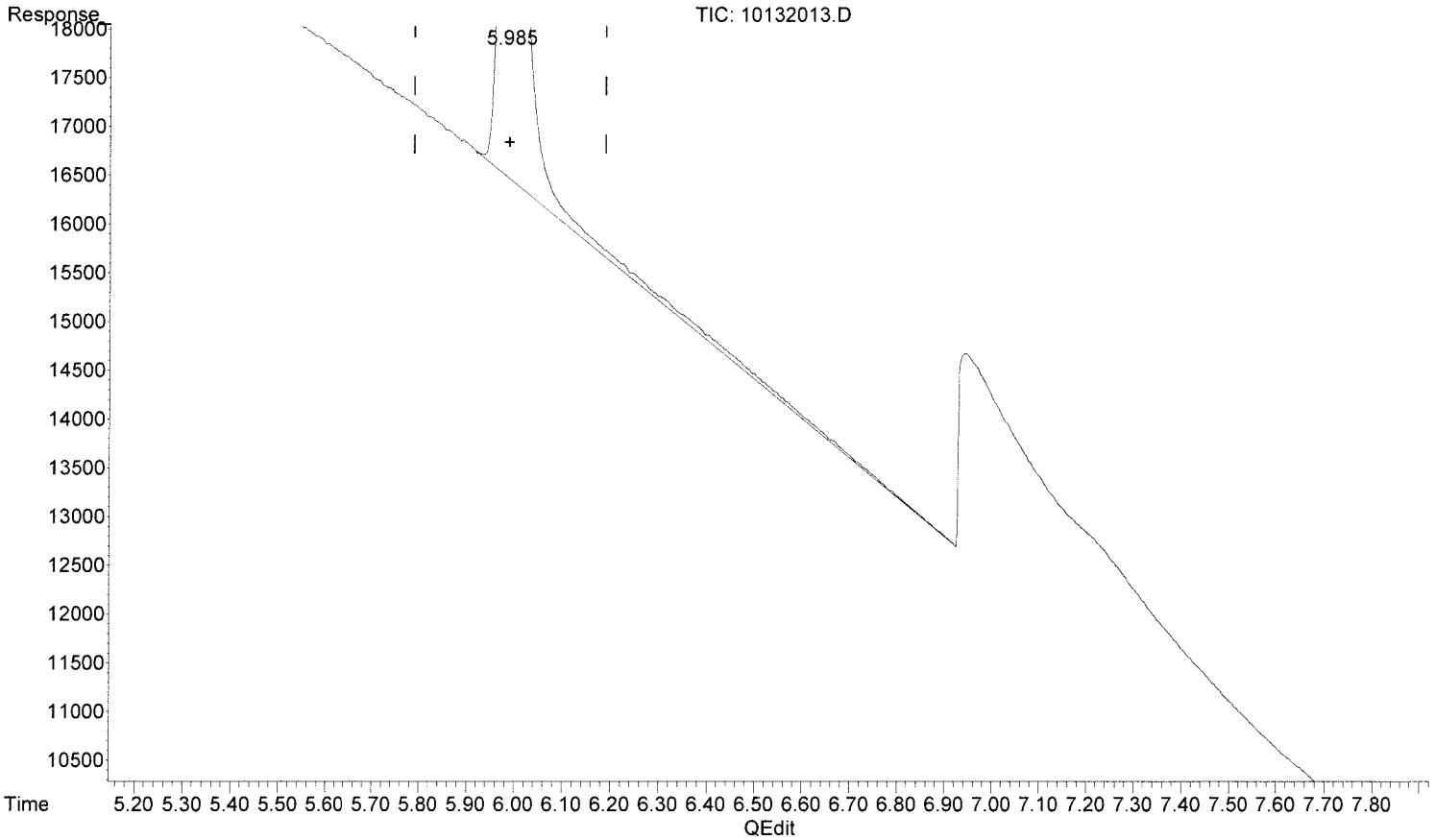


Quantitation Report (Qedit)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132013.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 16:09:44
Operator : WH
Sample : tcd lcsd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 16:32:34 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.986min 1081.359 ppm

response 253826

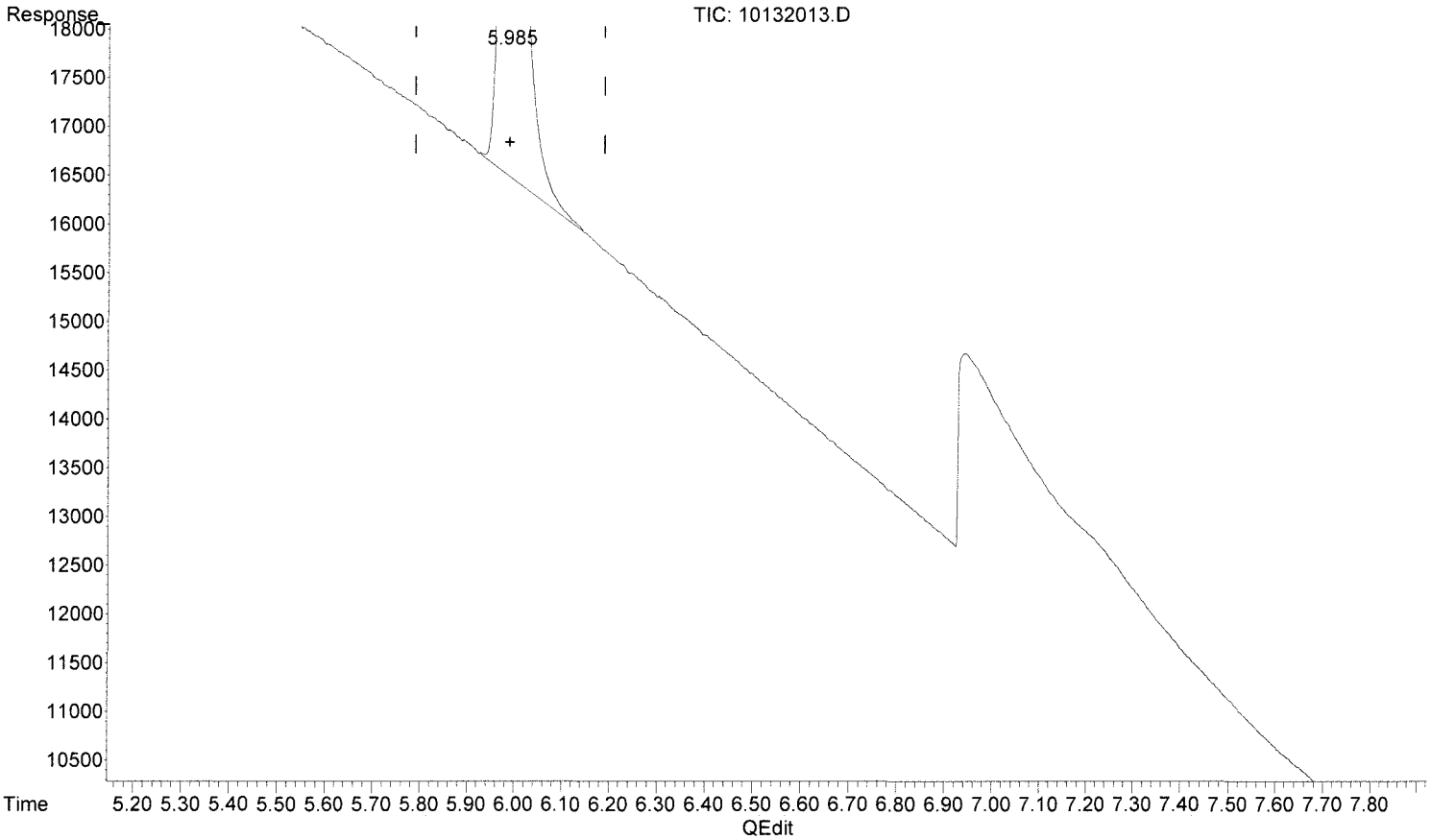
(+) = Expected Retention Time
RS082817_CO2.M Wed Oct 14 14:53:16 2020 Page: 1

Quantitation Report (Qedit)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132013.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 16:09:44
Operator : WH
Sample : tcd lcsd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 16:32:34 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.985min 975.556 ppm m

response 228991

MF 10/14/20

10/1 ITW BW

(+) = Expected Retention Time

RS082817_CO2.M Wed Oct 14 14:53:24 2020

Response Factor Report HP5890

Method Path : I:\GC10\METHODS\
Method File : RS082817_CO2.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Tue Aug 29 16:13:13 2017
Response Via : Initial Calibration

Calibration Files
1 =08291715.D 2 =08291716.D 3 =08291717.D
4 =08291719.D 5 =08291720.D 6 =08291721.D

	Compound	1	2	3	4	5	6	Avg		%RSD
1)	Oxygen/Argon	4.760						4.760	E6	0.00
2)	Carbon monoxide	2.775		1.066	0.043	0.033	0.027	0.657	E6	170.12
3)	Methane (TCD)							9.457		0.00
4)	Carbon dioxide	2.717	2.193	2.338	2.272	2.265	2.298	2.347	E2	7.99

Signal #2 Calibration Files
1 =08291715.D 2 =08291716.D 3 =08291717.D
4 =08291719.D 5 =08291720.D 6 =08291721.D

	Compound	1	2	3	4	5	6	Avg		%RSD
6)	Methane (FID)	1.253	1.160	1.005	0.927	0.848	0.848	0.945	E4	15.85
7)	Ethylene	1.677	1.605	1.900	1.749	1.597	1.579	1.684	E4	7.30
8)	Ethane	1.769	1.631	1.866	1.767	1.639	1.667	1.723	E4	5.40
9)	Propylene	2.402	2.309	2.767	2.551	2.331	2.333	2.449	E4	7.32
10)	Propane	2.906	2.737	2.817	2.639	2.410	2.420	2.655	E4	7.75
11)	Isobutylene							0.000		-1.00
12)	Isobutane							0.000		-1.00
13)	n-Butane							0.000		-1.00

(#) = Out of Range ### Number of calibration levels exceeded format ###

RS082817_CO2.M Wed Aug 30 13:24:19 2017

Calibration Status Report HP5890

Method Path : I:\GC10\METHODS\
Method File : RS082817_CO2.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Tue Aug 29 16:13:13 2017
Response Via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	1	0	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291715.D
2	2	0	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291716.D
3	3	3	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291717.D
4	4	10	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291719.D
5	5	25	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291720.D
6	6	125	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291721.D
7	7	5000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241708.D
8	8	25000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241709.D
9	9	2000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241710.D
10	10	30000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241711.D

#	ID	Update Time	Quant Time	Acquisition Time
1	1	Aug 29 14:21 2017	Aug 29 14:20 2017	29-Aug-2017, 14:07
2	2	Aug 29 14:52 2017	Aug 29 14:51 2017	29-Aug-2017, 14:22
3	3	Aug 29 15:04 2017	Aug 29 15:04 2017	29-Aug-2017, 14:53
4	4	Aug 29 15:36 2017	Aug 29 15:36 2017	29-Aug-2017, 15:23
5	5	Aug 29 15:57 2017	Aug 29 15:57 2017	29-Aug-2017, 15:44
6	6	Aug 29 16:13 2017	Aug 29 16:13 2017	29-Aug-2017, 16:00
7	7	Aug 25 09:05 2017	Aug 24 16:00 2017	24-Aug-2017, 15:44
8	8	Aug 25 09:06 2017	Aug 24 16:13 2017	24-Aug-2017, 16:02
9	9	Aug 25 09:06 2017	Aug 24 16:31 2017	24-Aug-2017, 16:16
10	10	Aug 25 09:07 2017	Aug 24 16:42 2017	24-Aug-2017, 16:33

RS082817_CO2.M Wed Aug 30 13:24:30 2017

dit Compounds -- Compound #4 -- Carbon dioxide

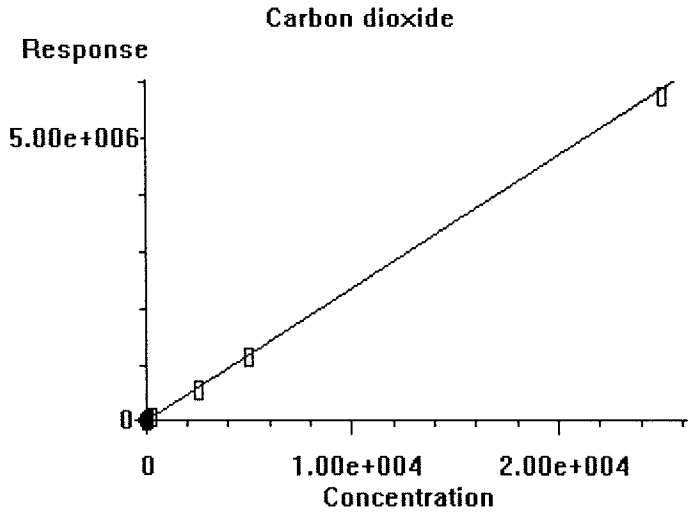
Search by: Ret Time Name Index Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	25.000000	6793.665186
2	100.000000	21932.418000
3	250.000000	58460.642510
4	2500.000000	568043.388750
5	5000.000000	1132363.215937
6	25000.000000	5744294.891563
7	25000.000000	
8	25000.000000	
9	2000.000000	
10	30000.000000	

Lvl ID	Concentration	Response



0.000e+000	Quadratic term
2.347e+002	Linear term
0.000e+000	Constant term
7.987%	RF Rel Std Dev

OK Cancel Help Print Calibration Curve Copy Calibration Curve

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:07
Operator : MC
Sample : 25ppm s32-08291701 0.25ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:20:06 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

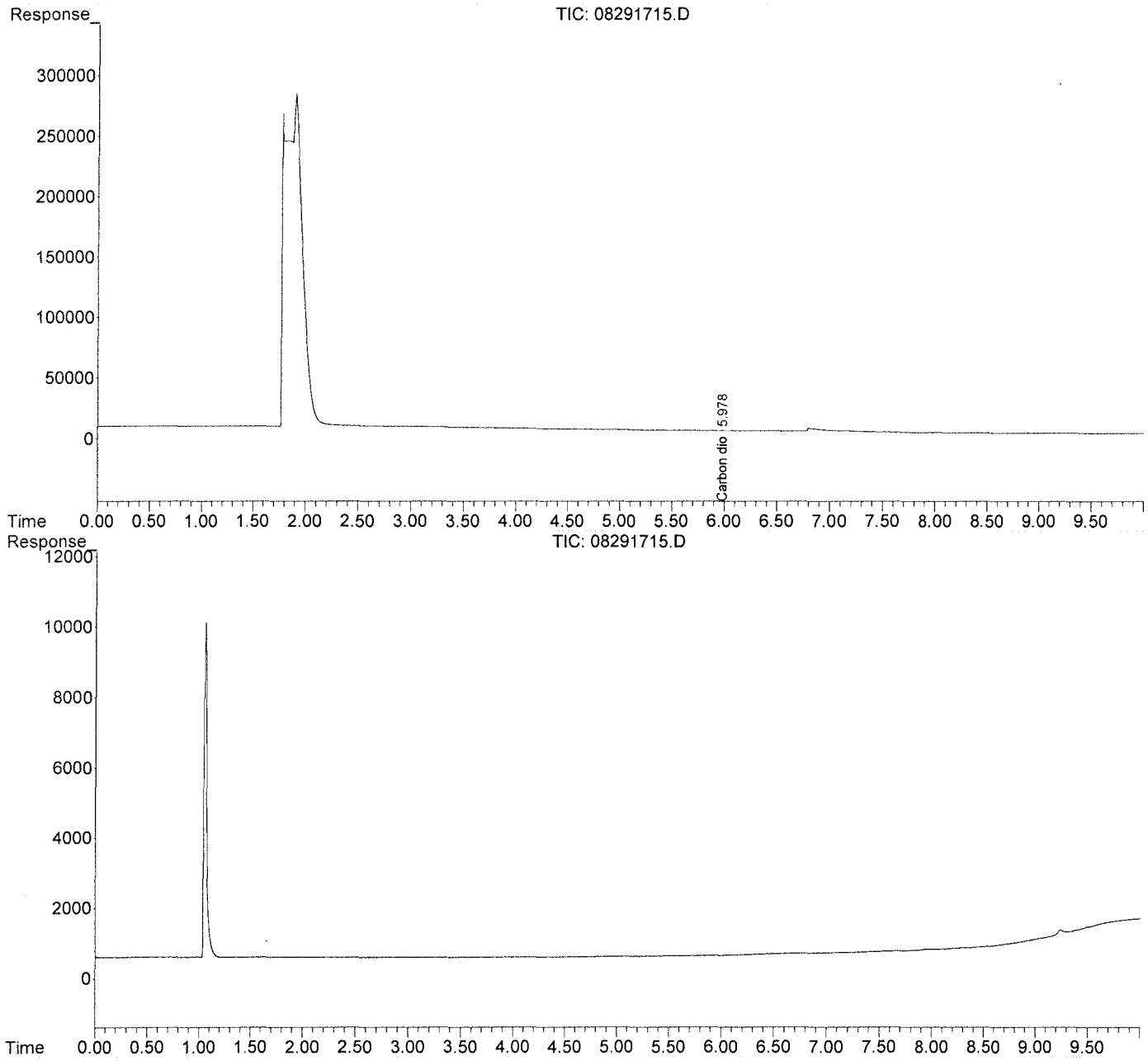
	Compound	R.T.	Response	Conc	Units	
Target	Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.776	277465	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	5.978	6794	27.870	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:07
Operator : MC
Sample : 25ppm s32-08291701 0.25ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:20:06 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

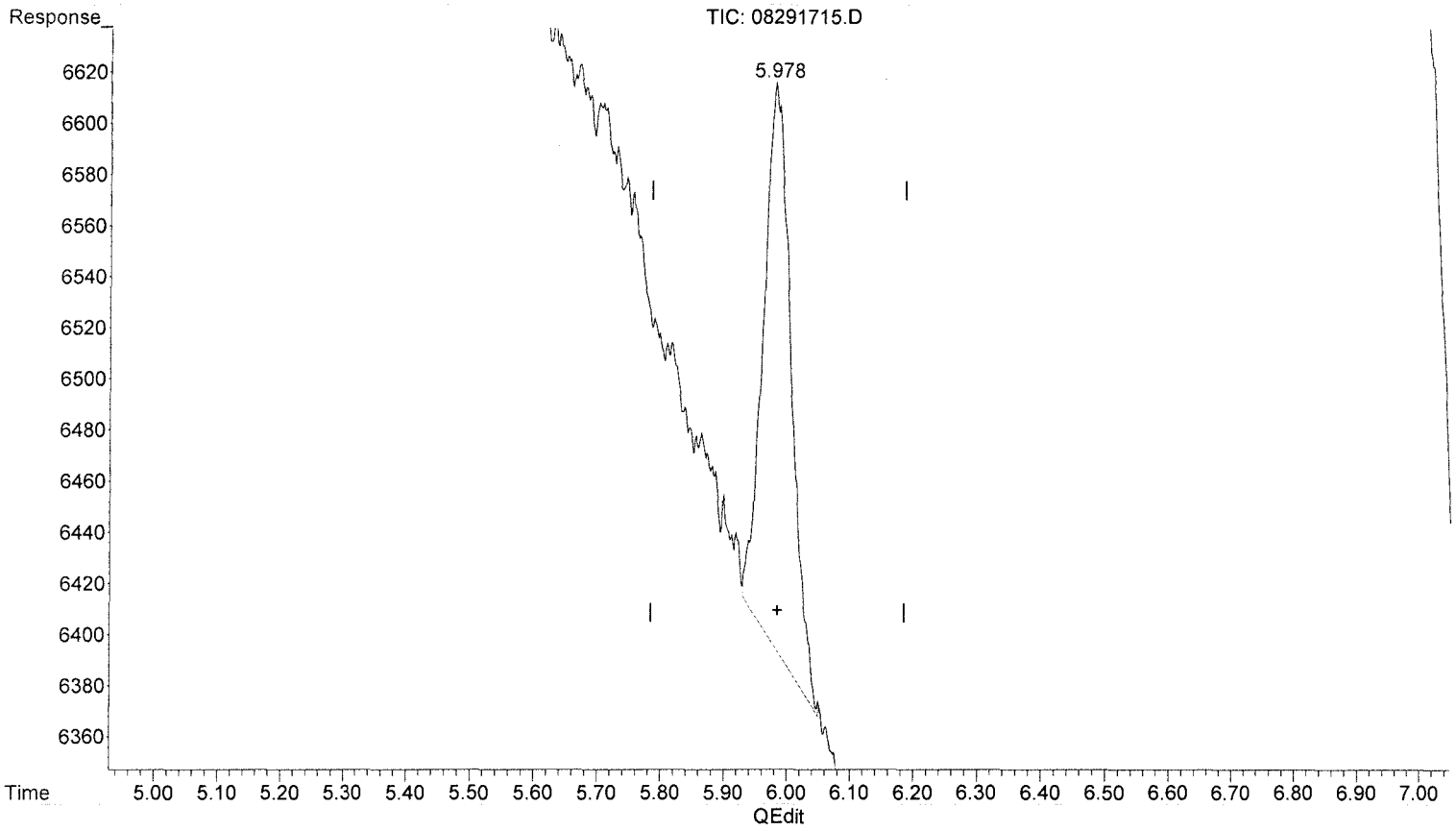
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:07
Operator : MC
Sample : 25ppm s32-08291701 0.25ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:20:06 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.978min 27.870 ppm m

response 6794

MG 9/30/17
BLK
MB
PRMW

MG 9/4/17

(+) = Expected Retention Time
RS082817_CO2.M Wed Aug 30 13:17:47 2017

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291716.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:22
Operator : MC
Sample : 100ppm s32-08291702 0.2ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:51:38 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:21:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

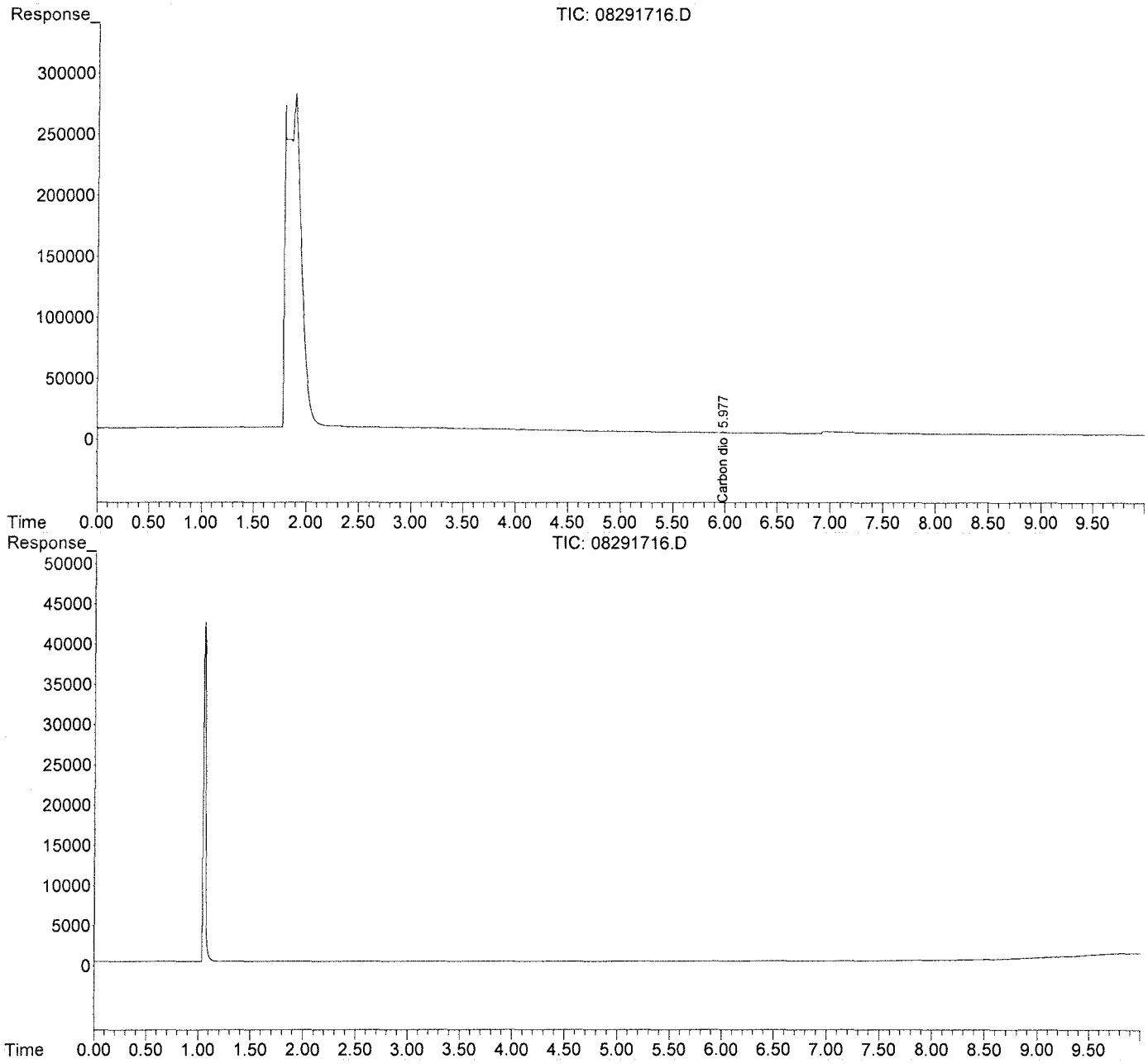
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.790	-598962	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	d
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	5.978	21932	87.858	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291716.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:22
Operator : MC
Sample : 100ppm s32-08291702 0.2ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:51:38 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:21:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

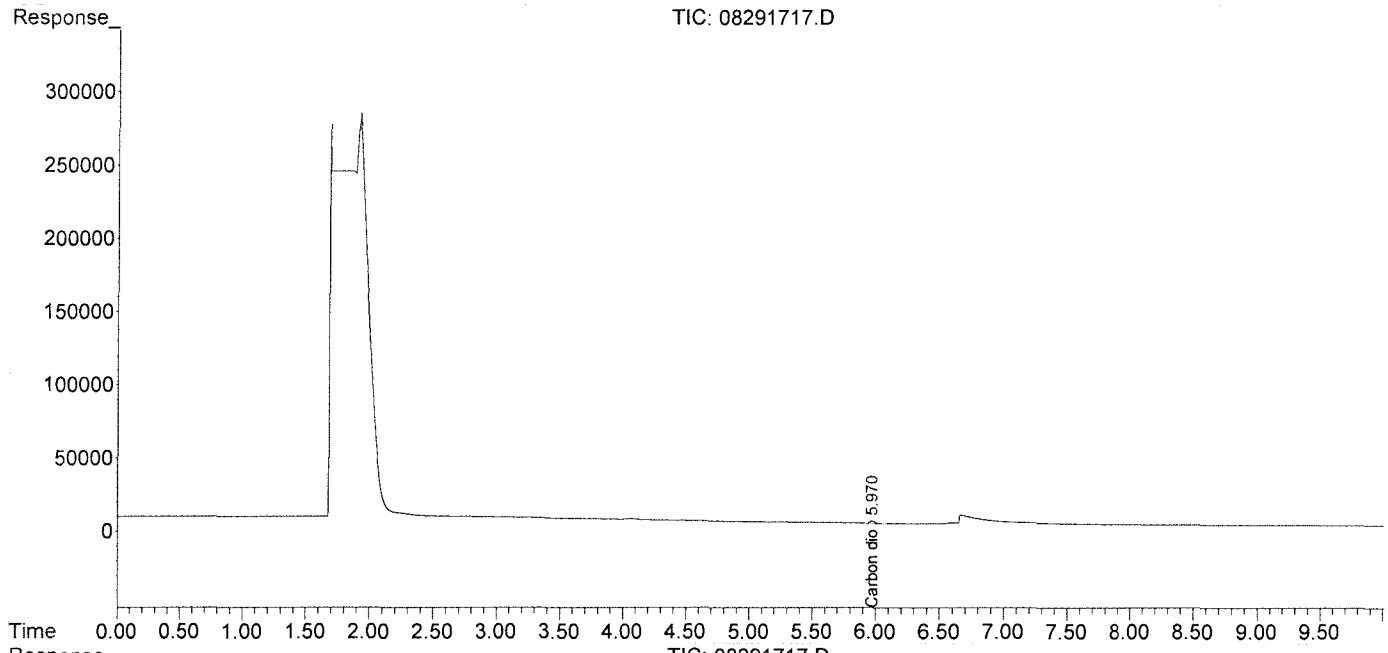
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.920f	-30716454	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	d
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.970	58461	240.204	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

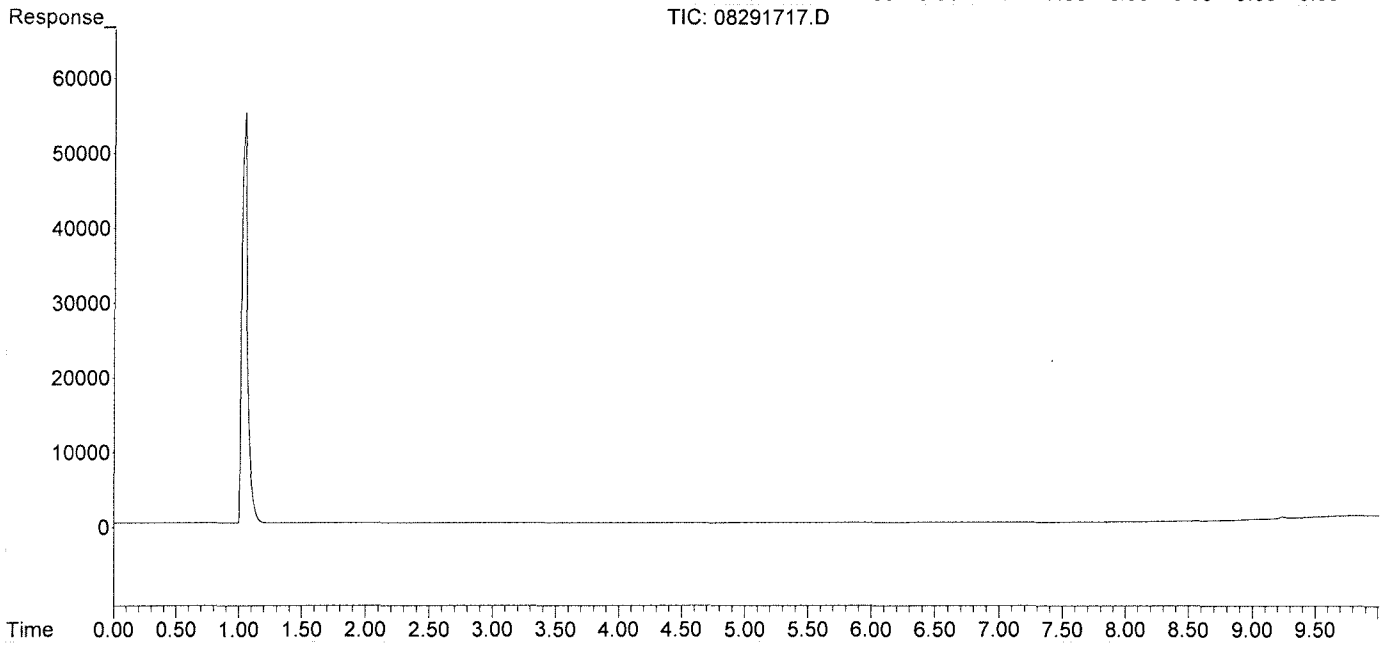
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

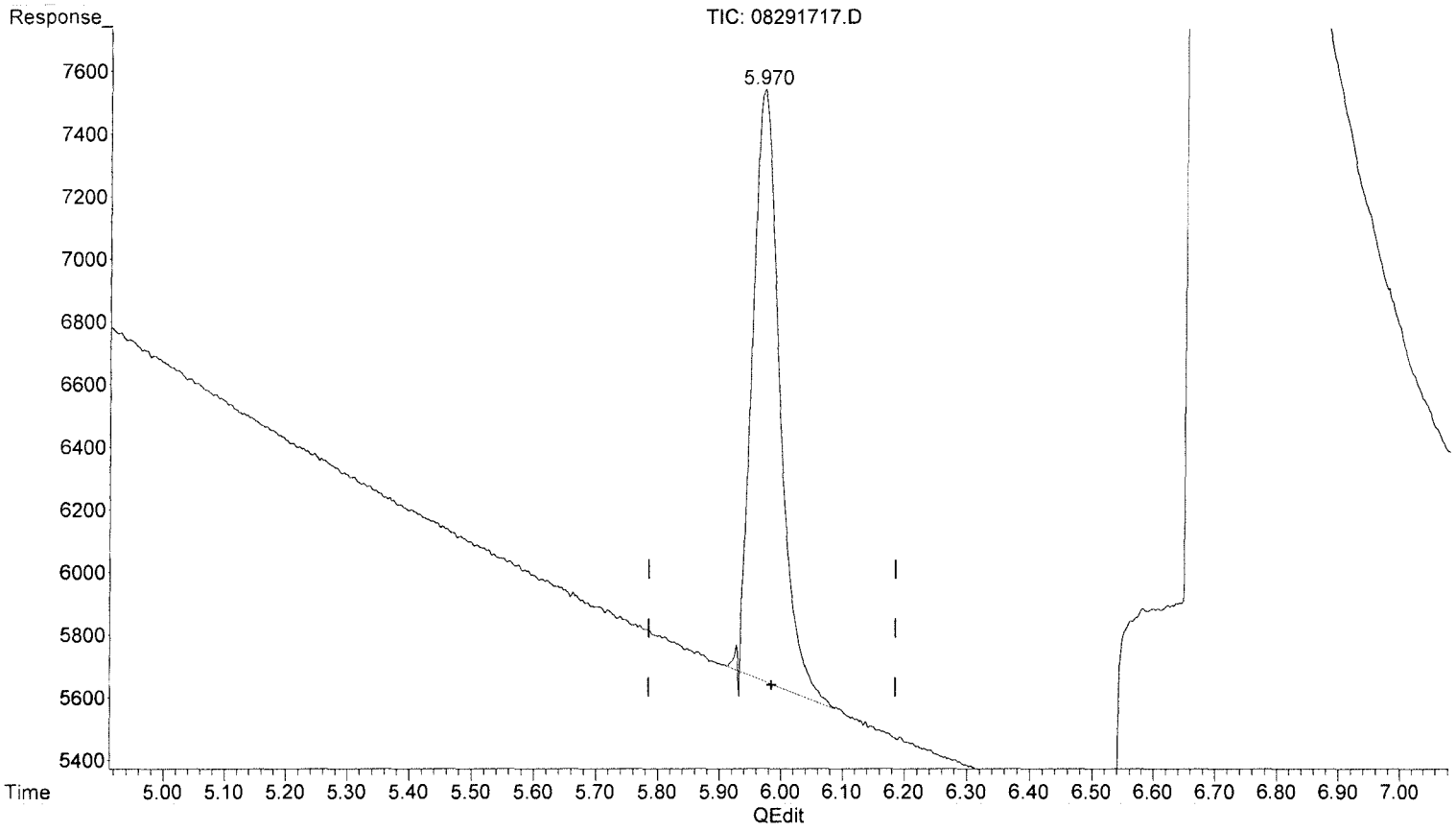




Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.970min 240.204 ppm m

response 58461

(+) = Expected Retention Time
RS082817_CO2.M Wed Aug 30 13:19:20 2017 Page: 1

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291719.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:23
Operator : MC
Sample : 2500ppm s32-08231701 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:35:50 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:04:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

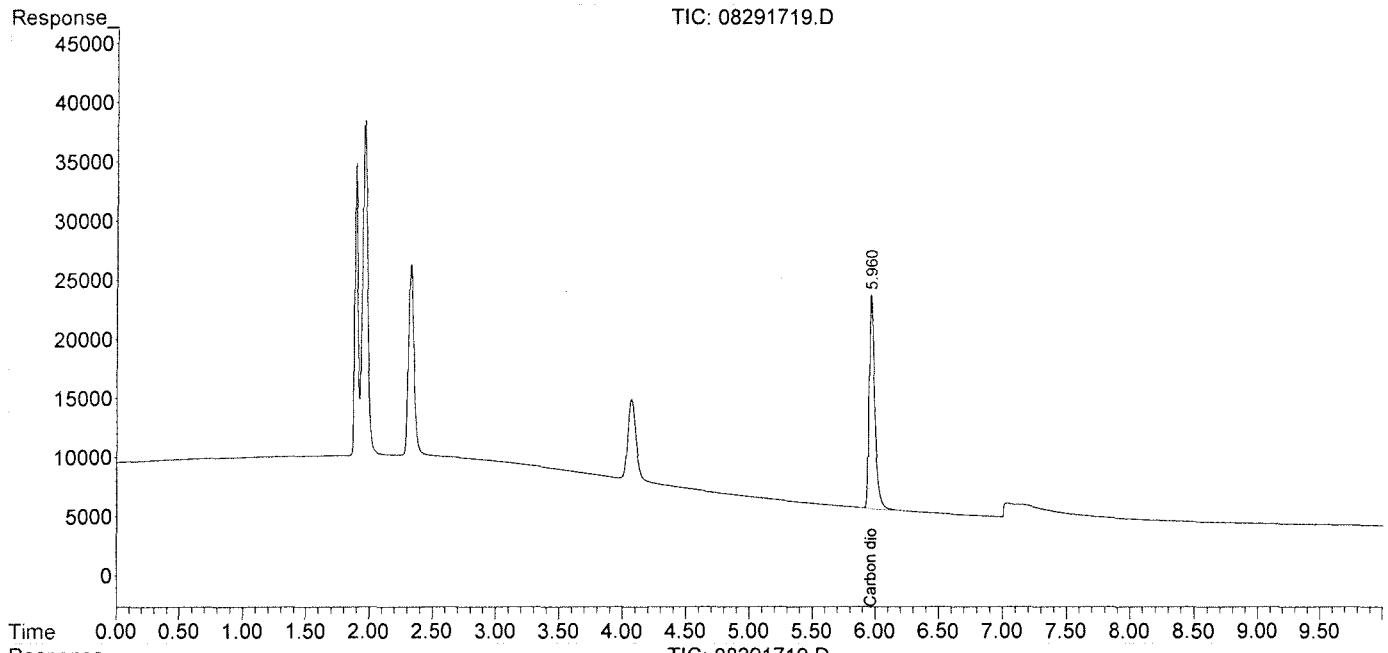
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.891	425113	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.962	568043	2369.673	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

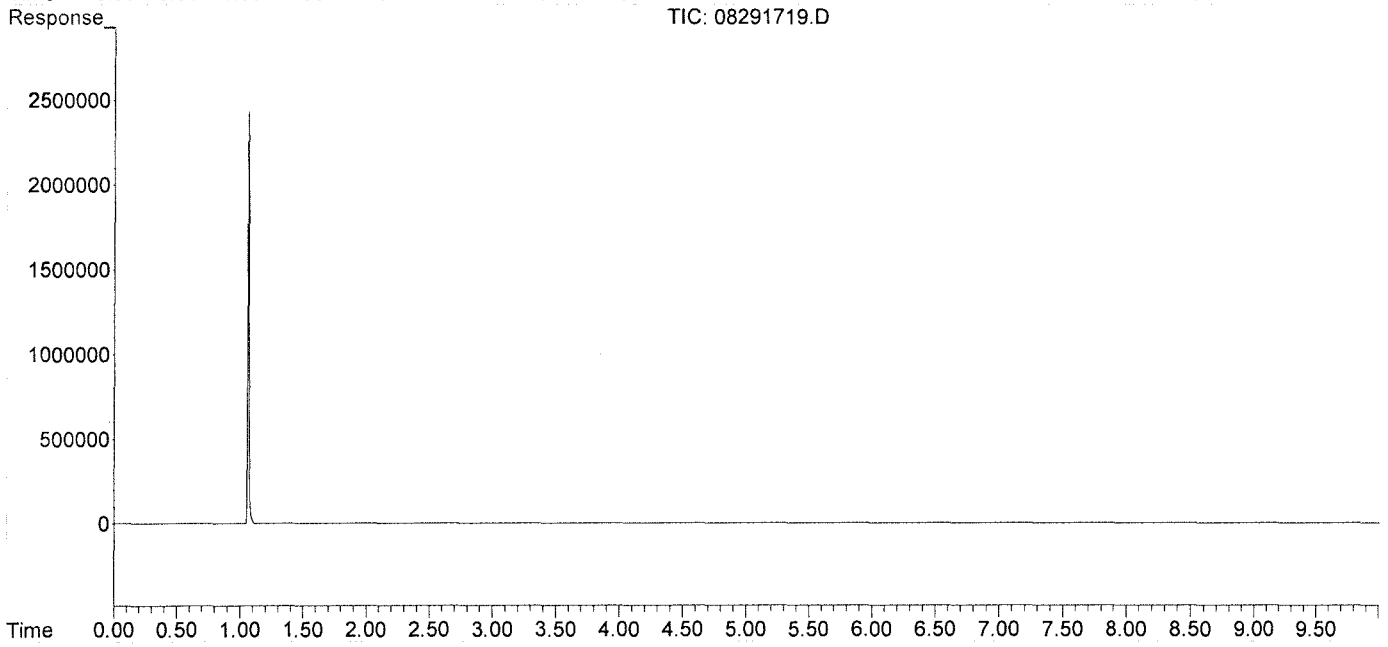
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291719.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:23
Operator : MC
Sample : 2500ppm s32-08231701 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:35:50 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:04:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291720.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:44
Operator : MC
Sample : 5000ppm s32-08231701 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:57:17 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:36:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

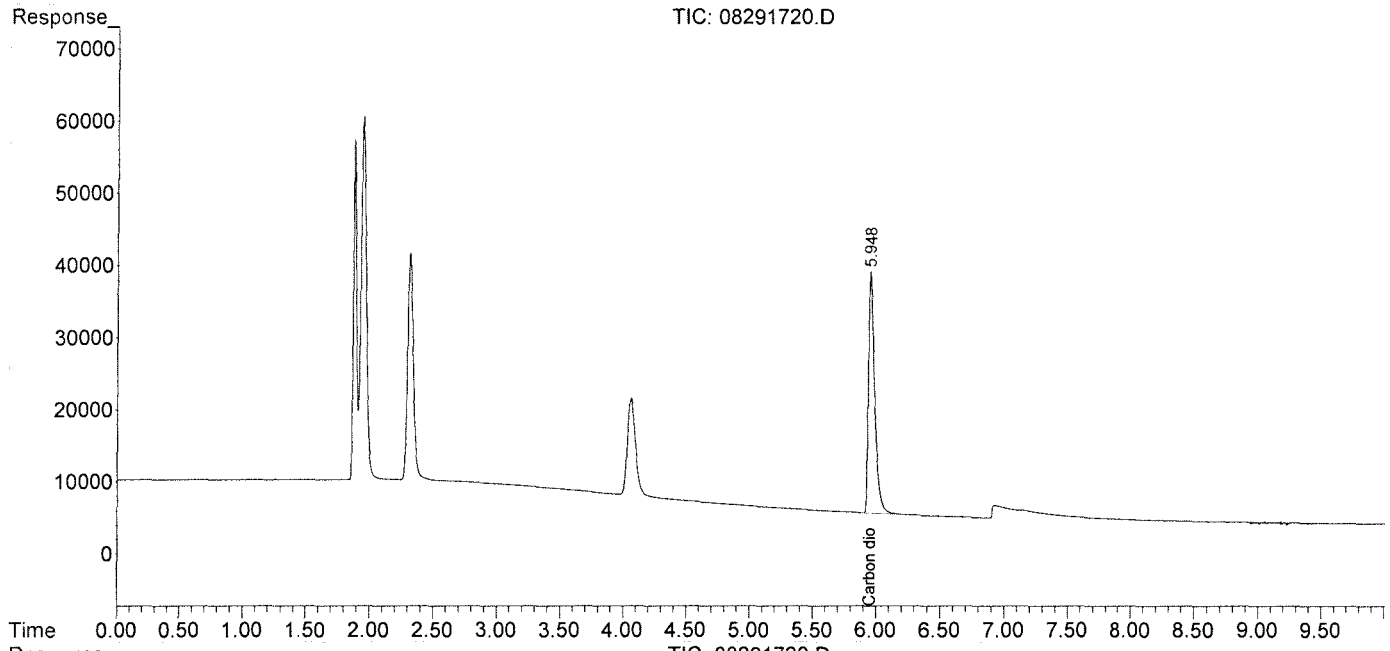
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.880	819221	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.948	1132363	4753.126	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

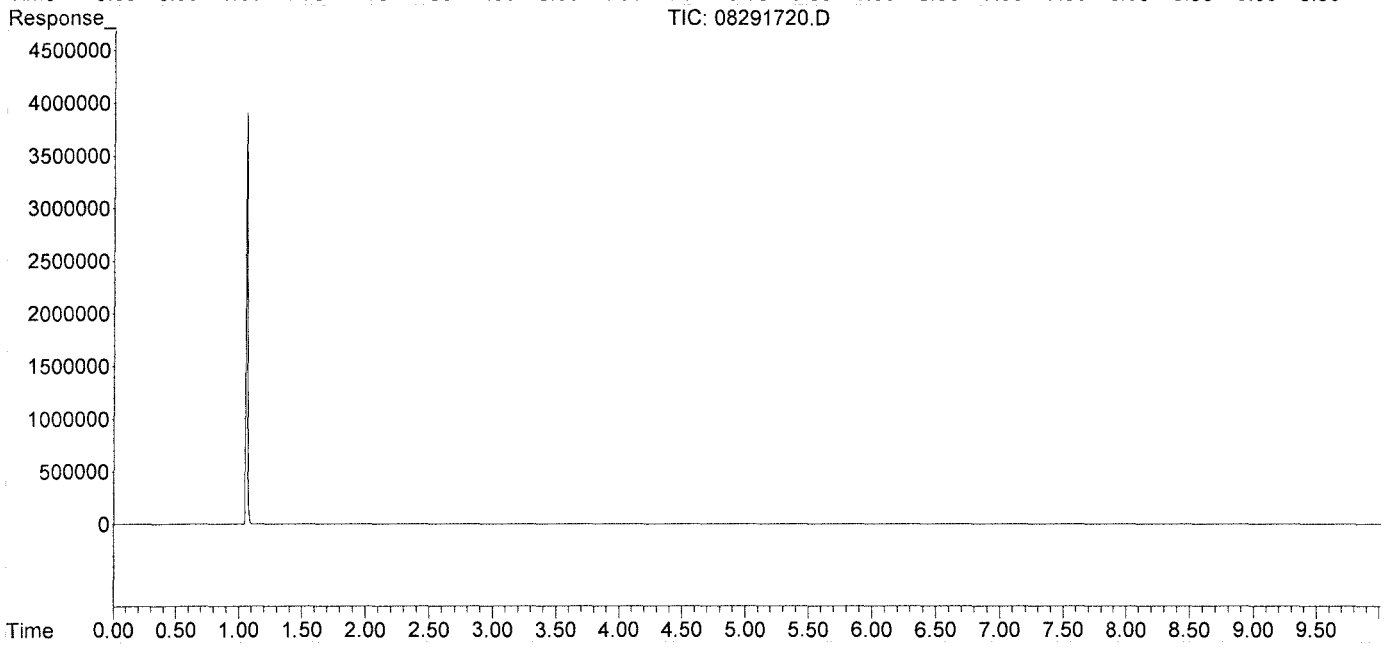
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291720.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:44
Operator : MC
Sample : 5000ppm s32-08231701 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:57:17 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:36:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291721.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:00
Operator : MC
Sample : 25000ppm s32-08231701 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:12:53 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:57:37 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

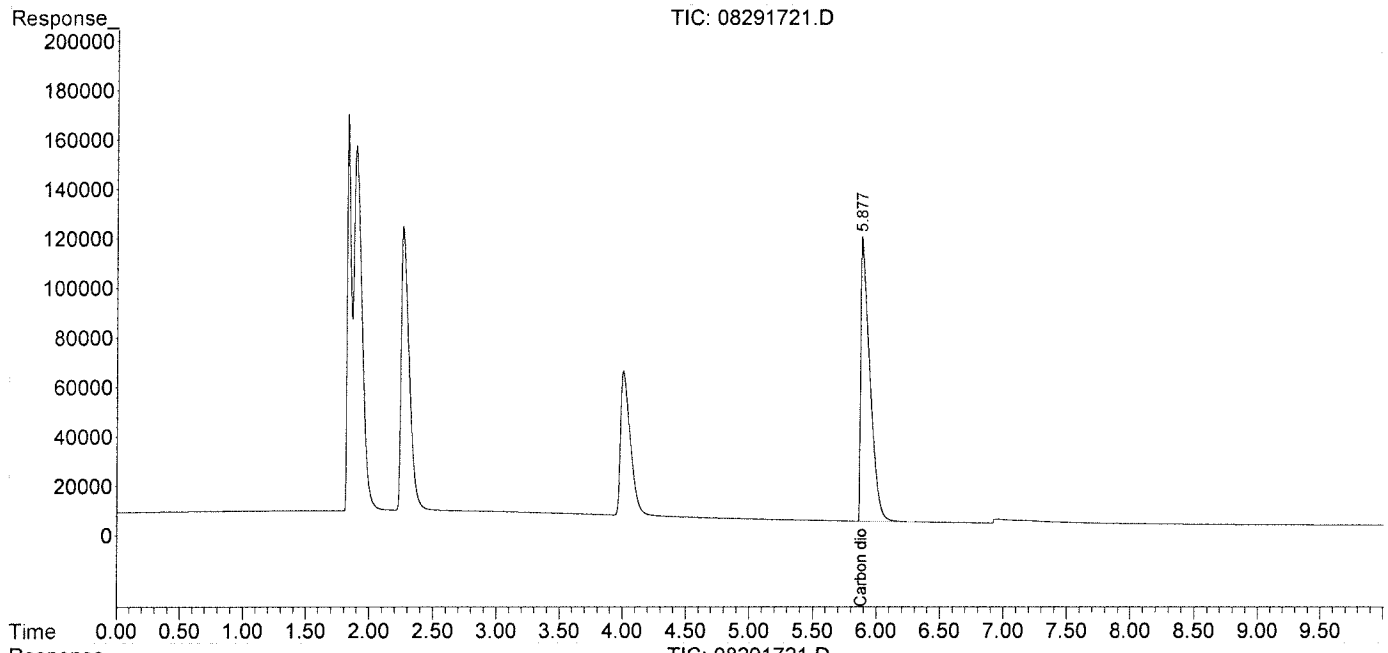
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.827	3325463	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.879f	5744295	24443.288	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

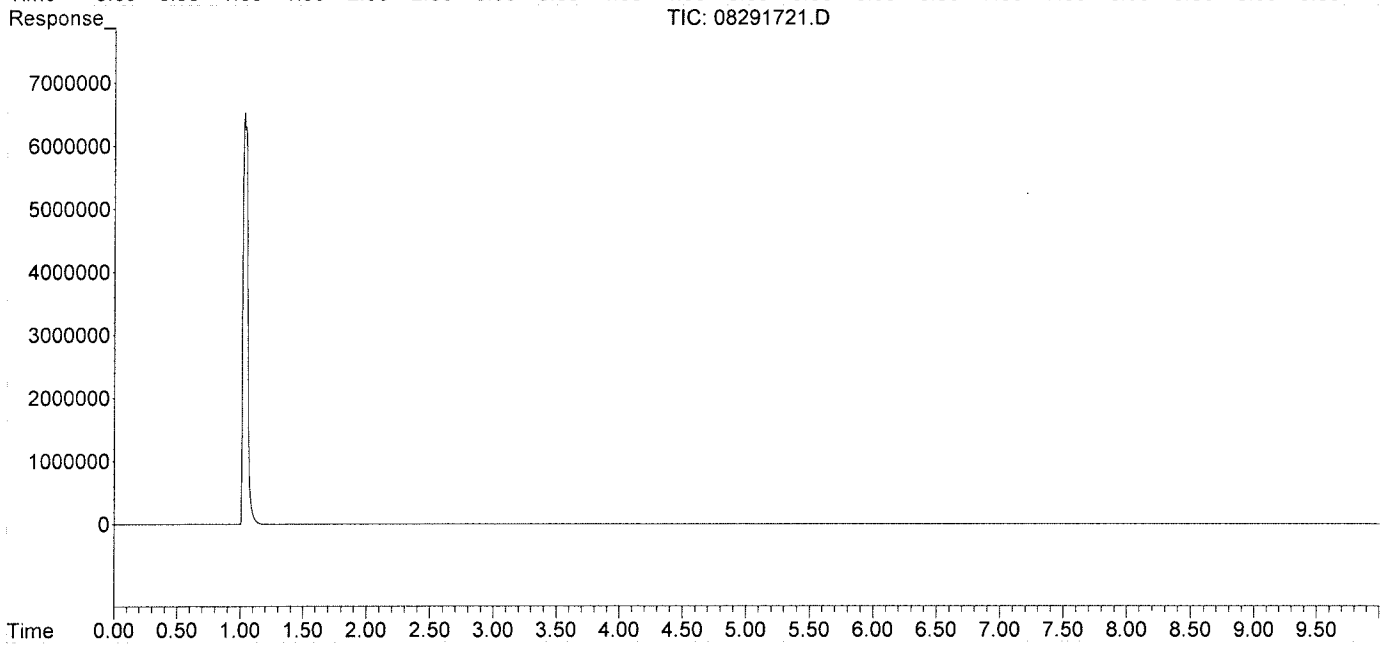
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291721.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:00
Operator : MC
Sample : 25000ppm s32-08231701 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:12:53 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:57:37 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291723.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:35
Operator : MC
Sample : icv s30-07071701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:54:07 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.886	536422	0.113	ppm
2)	Carbon monoxide	1.886	536422	N.D.	ppm
3)	Methane (TCD)	4.059f	626500	66244.710	ppm
4)	Carbon dioxide	5.947	1163775	4957.948	ppm
6)	Methane (FID)	1.062	37290742	3947.023	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

Actual %D
5000 99.16

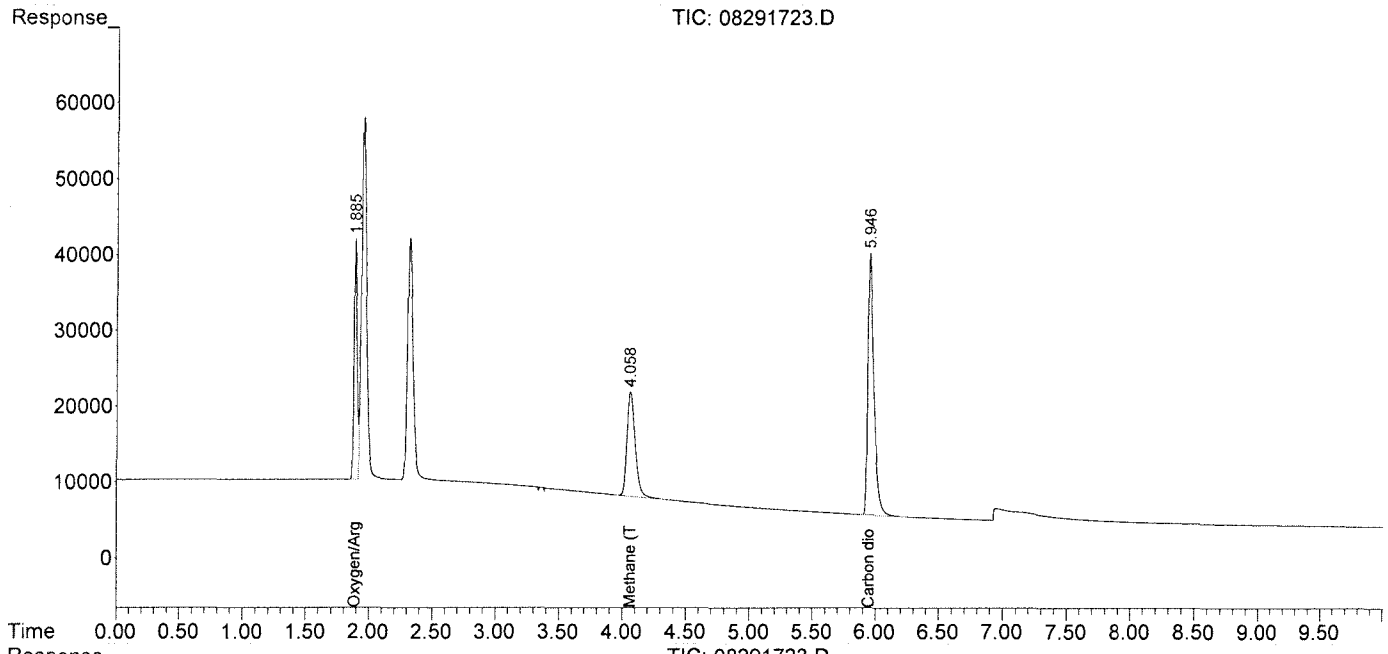
(f)=RT Delta > 1/2 Window (m)=manual int.

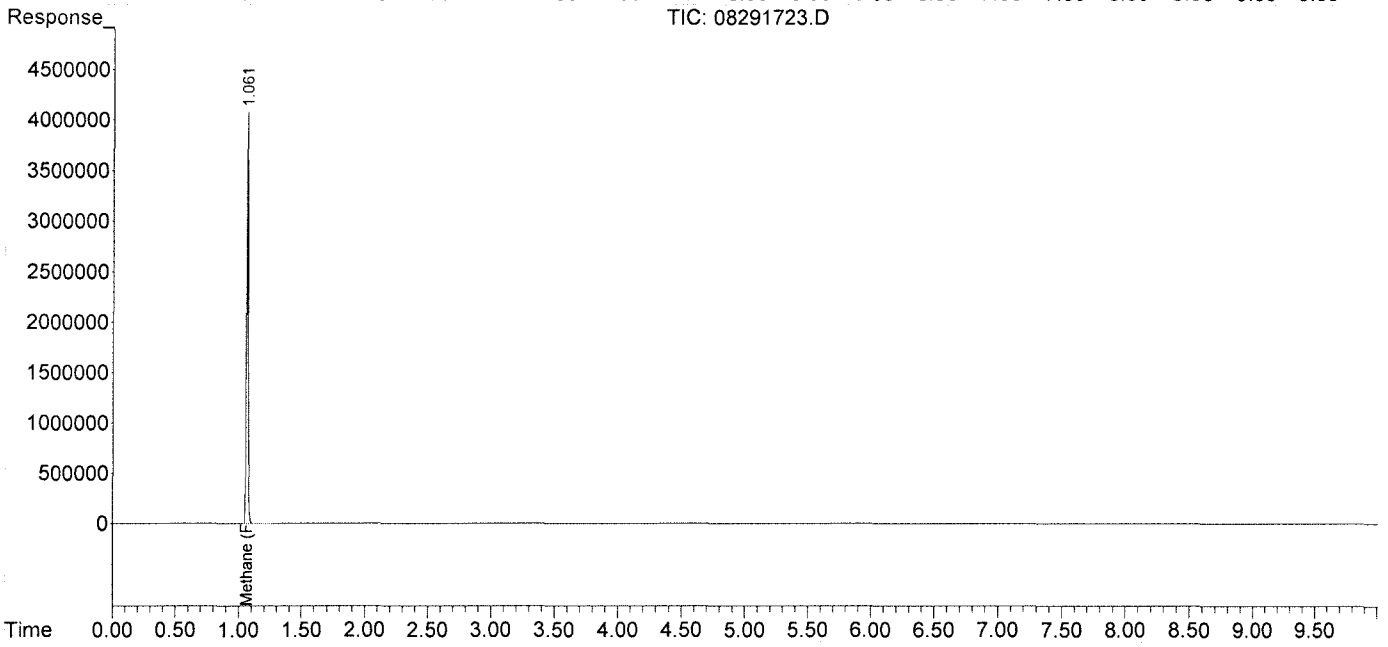
9/4/17

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291723.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:35
Operator : MC
Sample : icv s30-07071701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:54:07 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Dissolved Gases by RSK175

ALS Environmental

Method : RSK175 Headspace Method for Dissolved Hydrocarbon in Water by FID/TCD

Client : ALS Laboratory Group | Analyst : WH | Instrument : GC#10

Service Request: P2005613 | Date Analysis : 10/13/20 | Detector : FID#10, TCD#10

Sample Vol. (ml) : 32.00 ml | Head Space Vol.(ml) : 8.00 ml | Gas Constant : 24.05684 (20°C)

FINAL RESULT (ug/L)

Sample ID	Carbon Dioxide
RL	**1000.00**
mcs 01ml	ND
rb 01ml	ND
tcd lcs 0.1ml	21716.89
tcd lcsd 0.1ml	21288.85
P2005613-001 0.1ml	171332.5
P2005613-002 0.1ml	308899.8
P2005613-003 0.1ml	74345.7
P2005613-004 0.1ml	79287.0
P2005613-005 0.1ml	93315.9
P2005613-006 0.1ml	139454.8

SPIKE RECOVERY SUMMARY (ug/L)

Sample ID	Carbon Dioxide
mcs 01ml	ND
Amount Spiked	22914.48
tcd lcs	21716.89
% Recovered	94.8%
tcd lcsd	21288.85
% Recovered	92.9%
% RPD	2.0%
Amount Spiked	22914.5
P2005613-001ms 0.1ml	198897.7
	120.3%
P2005613-001msd 0.1ml	197539.6
	114.4%
	5.1%

P2005613-001ms 0.1ml	198897.7
P2005613-001msd 0.1ml	197539.6

Calculation :

1). Final Headspace Result (ppm) = ppm / Actual Injection Volume (mL)

2). Gas in Water (ug/L) : =[Final Headspace Result (mL) / 10^6 mL * 55.51 mole/L * MWt.(16.04 g/mole for CH4) * 1000 mg/g * 1000 ug/mg]/Henry's Constant

3). Gas in Head Space (ug/L) : = Final Headspace Result (mL) / 10^6 mL * mole/24.06 L (gas constant @20°C) * MWt.(16.04 g/mole for CH4) * 1000 mg/g * 1000 ug/g * L/1000mL * Headspace Volume (mL) / Sample Volume (mL) * 1000 mL/L

4.) Total final result : = 1) + 2)

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132001.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 12:25:39
Operator : WH
Sample : STD S32-06222001
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 12:38:16 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

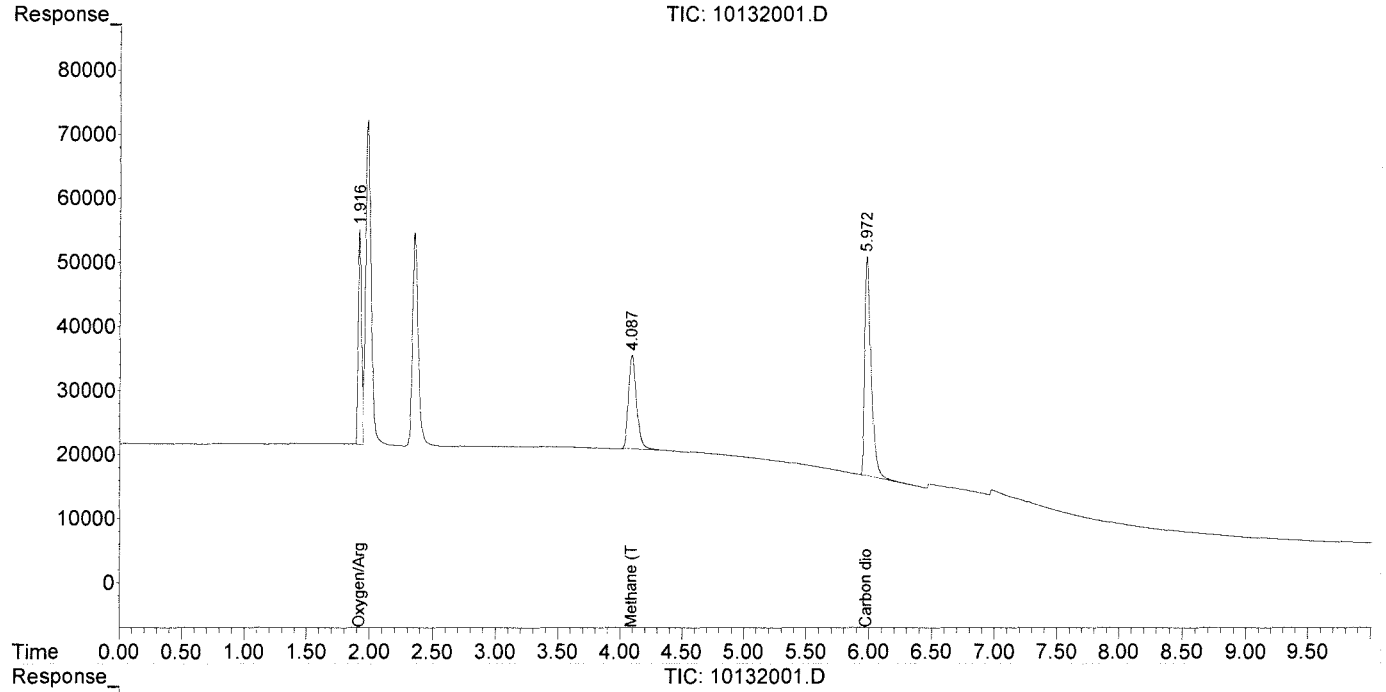
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.917f	588079	0.124	ppm
2)	Carbon monoxide	1.917f	588079	N.D.	ppm
3)	Methane (TCD)	4.088f	664246	70235.959	ppm
4)	Carbon dioxide	5.973	1215306	5177.482	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

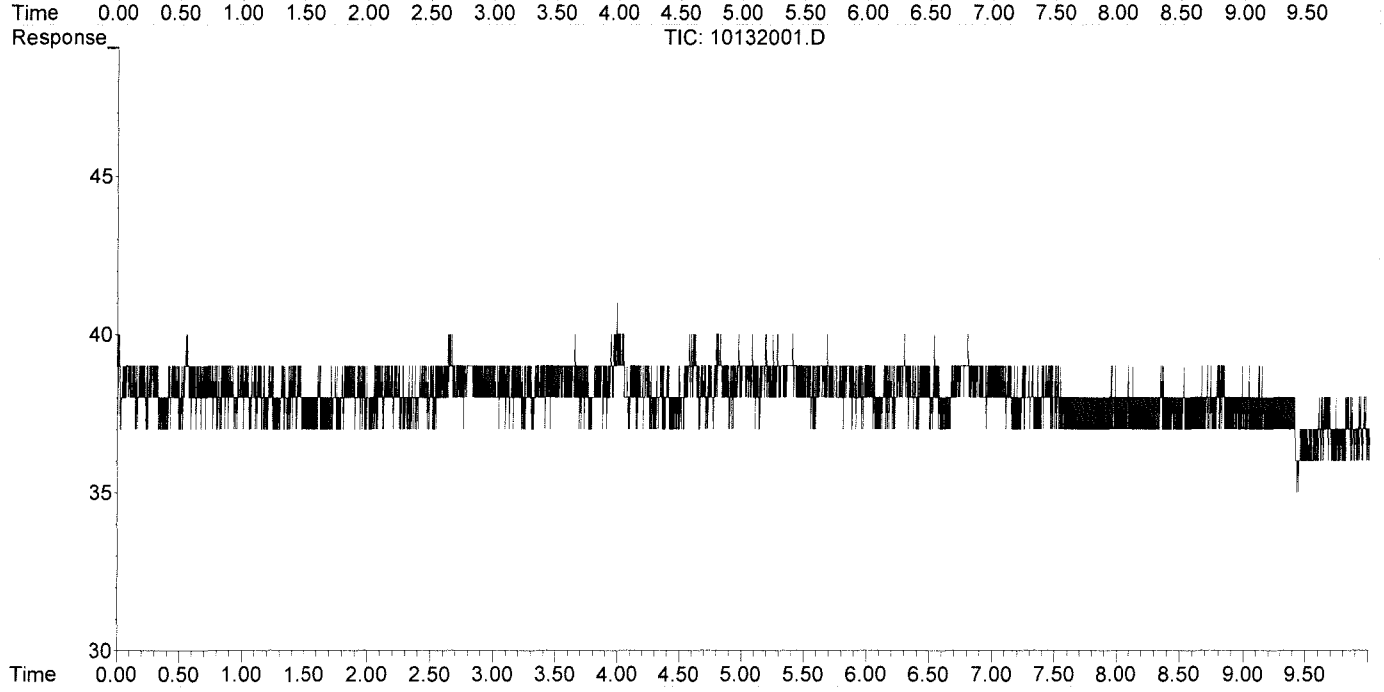
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132001.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 12:25:39
Operator : WH
Sample : STD S32-06222001
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 12:38:16 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132014.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 16:32:01
Operator : WH
Sample : STD S32-06222001
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 17:01:03 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

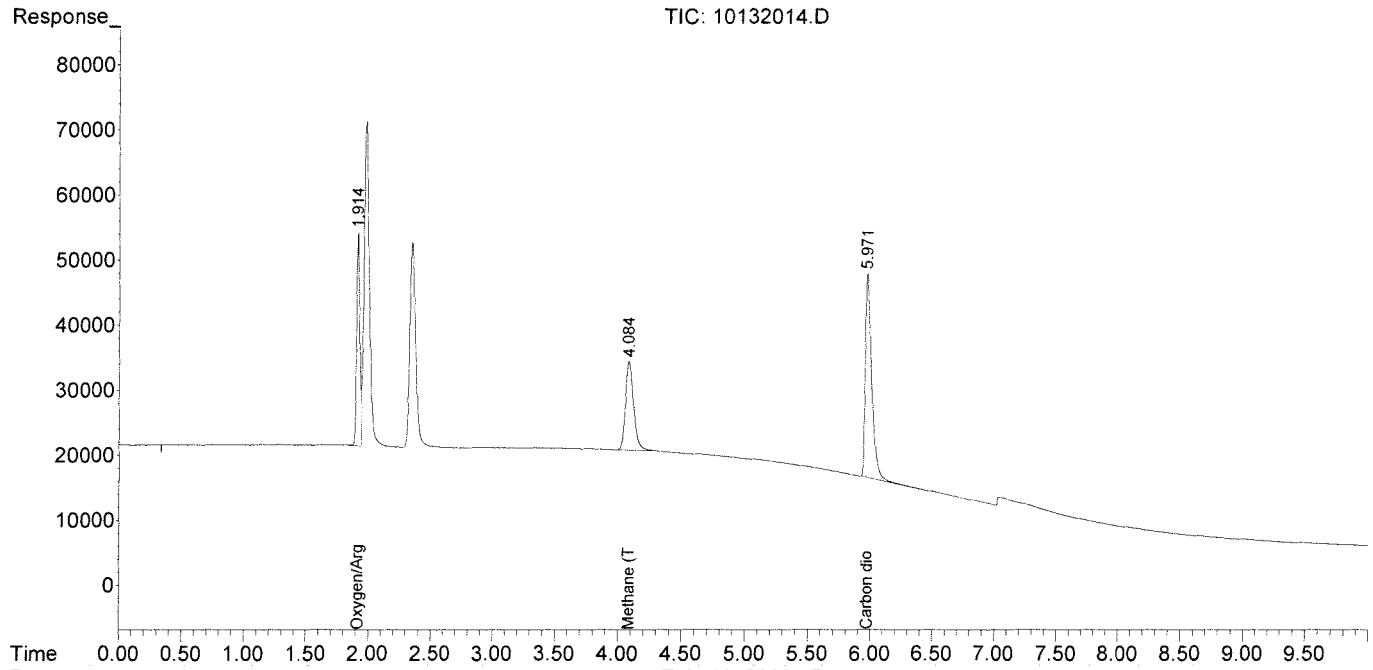
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.914f	575339	0.121	ppm
2)	Carbon monoxide	1.914f	575339	N.D.	ppm
3)	Methane (TCD)	4.085f	617645	65308.419	ppm
4)	Carbon dioxide	5.972	1113489	4743.720	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

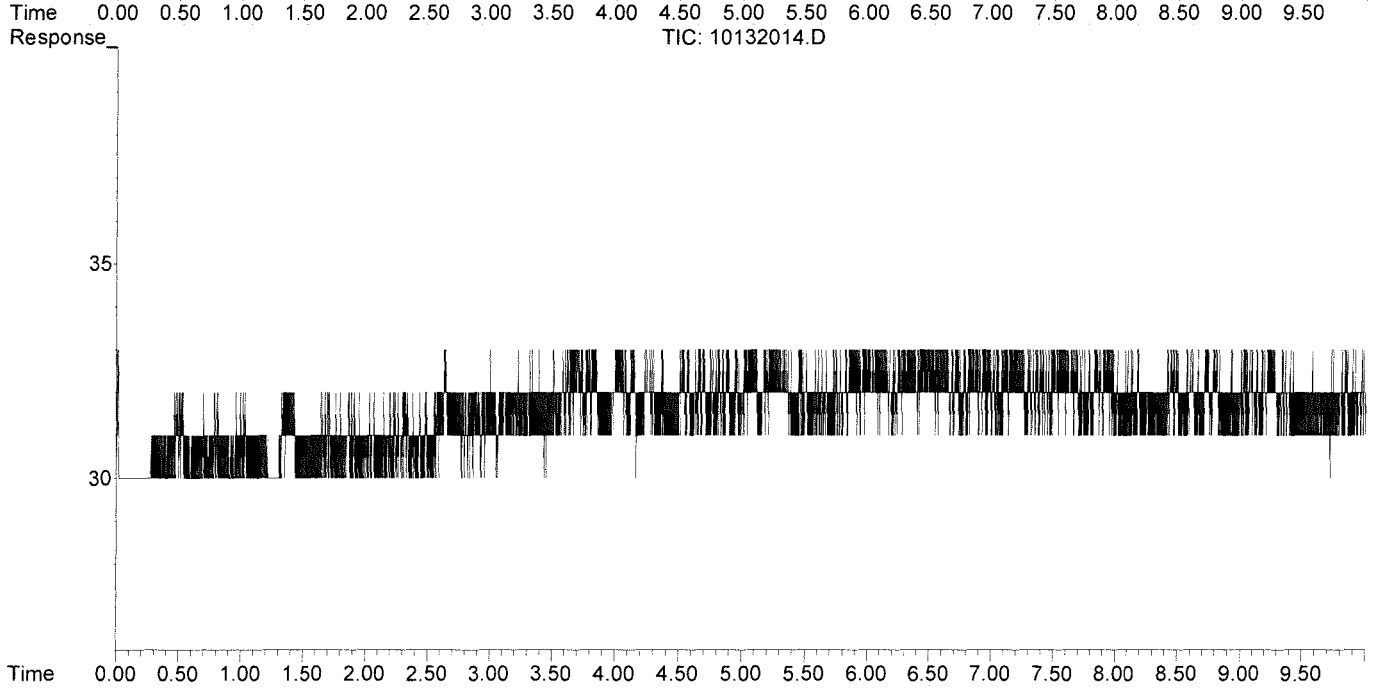
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132014.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 16:32:01
Operator : WH
Sample : STD S32-06222001
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 17:01:03 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Injection Log

Directory: I:\GC10\DATA\RSK_FID\2017_08\29\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	29-Aug-17, 07:58:00	08291701.D	std s30-06161601		MC	RSKBOTH.M	Pass
2	29-Aug-17, 08:11:02	08291702.D	mb 0.5ml		MC	RSKBOTH.M	Pass
3	29-Aug-17, 08:24:13	08291703.D	4089-001 0.5ml		MC	RSKBOTH.M	
4	29-Aug-17, 08:39:29	08291704.D	4089-002 0.5ml		MC	RSKBOTH.M	
5	29-Aug-17, 08:53:38	08291705.D	4089-003 0.5ml		MC	RSKBOTH.M	
6	29-Aug-17, 09:33:52	08291706.D	4089-004 0.5ml		MC	RSKBOTH.M	
7	29-Aug-17, 09:50:51	08291707.D	4089-005 0.5ml		MC	RSKBOTH.M	
8	29-Aug-17, 10:07:54	08291708.D	4089-006 0.5ml		MC	RSKBOTH.M	
9	29-Aug-17, 10:42:34	08291709.D	4089-007 0.5ml		MC	RSKBOTH.M	
10	29-Aug-17, 11:06:01	08291710.D	4089-008 0.5ml		MC	RSKBOTH.M	
11	29-Aug-17, 11:23:53	08291711.D	4089-009 0.5ml		MC	RSKBOTH.M	
12	29-Aug-17, 11:37:17	08291712.D	lcs s30-05241604		MC	RSKBOTH.M	Pass
13	29-Aug-17, 11:50:31	08291713.D	lcs s30-05241604		MC	RSKBOTH.M	Pass
14	29-Aug-17, 12:29:45	08291714.D	std s30-06161601		MC	RSKBOTH.M	Pass
15	29-Aug-17, 14:07:01	08291715.D	25ppm s32-08291701 0.25ml		MC	RSKBOTH.M	Curve
16	29-Aug-17, 14:22:12	08291716.D	100ppm s32-08291702 0.2ml		MC	RSKBOTH.M	Curve
17	29-Aug-17, 14:53:00	08291717.D	250ppm s32-08291702 0.5ml		MC	RSKBOTH.M	Curve
18	29-Aug-17, 15:07:43	08291718.D	mis inject		MC	RSKBOTH.M	
19	29-Aug-17, 15:23:21	08291719.D	2500ppm s32-08231701 50ul		MC	RSKBOTH.M	Curve
20	29-Aug-17, 15:44:54	08291720.D	5000ppm s32-08231701 0.1ml		MC	RSKBOTH.M	Curve
21	29-Aug-17, 16:00:09	08291721.D	25000ppm s32-08231701 0.5ml		MC	RSKBOTH.M	Curve
22	29-Aug-17, 16:15:43	08291722.D	mb 0.1ml		MC	RSKBOTH.M	Pass
23	29-Aug-17, 16:35:37	08291723.D	icv s30-07071701		MC	RSKBOTH.M	Pass

Injection Log

Directory: I:\GC10\DATA\RSK_TCD\2020_10\13\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	13-Oct-20, 12:25:39	10132001.D	STD S32-06222001		WH	RSKBOTH.M	pass
2	13-Oct-20, 12:39:57	10132002.D	rb 01ml		WH	RSKBOTH.M	pass
3	13-Oct-20, 12:55:09	10132003.D	mcs 01ml		WH	RSKBOTH.M	pass
4	13-Oct-20, 13:22:16	10132004.D	P2005613-002 0.1ml		WH	RSKBOTH.M	
5	13-Oct-20, 13:37:18	10132005.D	P2005613-003 0.1ml		WH	RSKBOTH.M	
6	13-Oct-20, 14:00:18	10132006.D	P2005613-004 0.1ml		WH	RSKBOTH.M	
7	13-Oct-20, 14:44:17	10132007.D	P2005613-005 0.1ml		WH	RSKBOTH.M	
8	13-Oct-20, 14:57:51	10132008.D	P2005613-006 0.1ml		WH	RSKBOTH.M	
9	13-Oct-20, 15:13:31	10132009.D	P2005613-001 0.1ml		WH	RSKBOTH.M	
10	13-Oct-20, 15:27:19	10132010.D	P2005613-001ms 0.1ml		WH	RSKBOTH.M	pass
11	13-Oct-20, 15:42:42	10132011.D	P2005613-001msd 0.1ml		WH	RSKBOTH.M	pass
12	13-Oct-20, 15:56:01	10132012.D	tcd lcs 0.1ml		WH	RSKBOTH.M	pass
13	13-Oct-20, 16:09:44	10132013.D	tcd lcsd 0.1ml		WH	RSKBOTH.M	pass
14	13-Oct-20, 16:32:01	10132014.D	STD S32-06222001		WH	RSKBOTH.M	pass

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082009.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 13:34:41
Operator : WH
Sample : P2005613-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 14:10:24 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

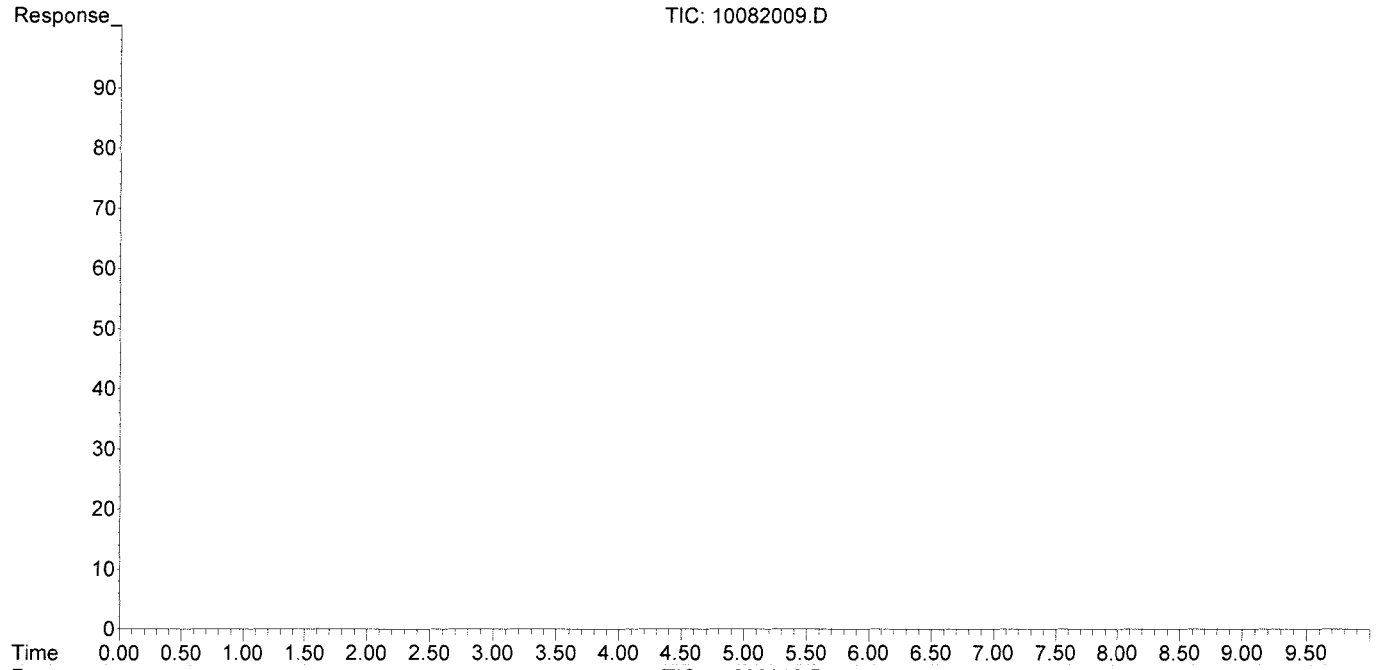
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.118	10348	1.141	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

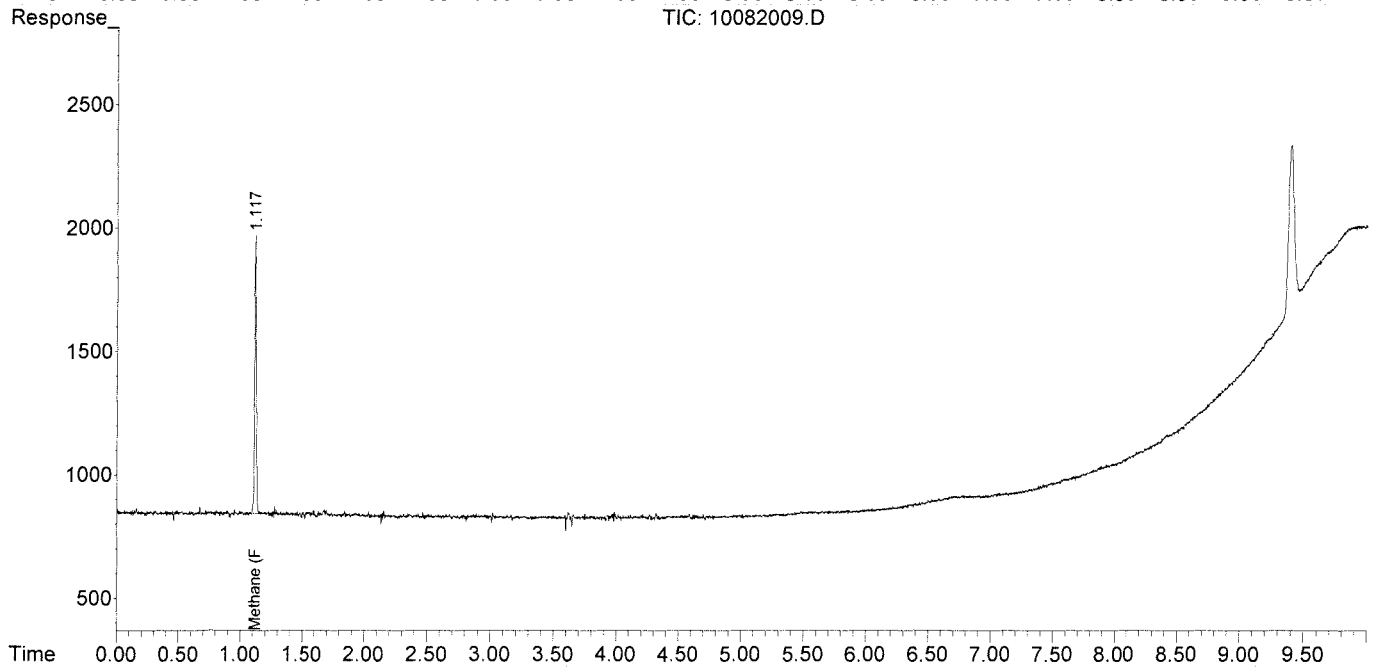
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082009.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 13:34:41
Operator : WH
Sample : P2005613-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 14:10:24 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082009.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 13:34:41
Operator : WH
Sample : P2005613-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 14:10:24 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

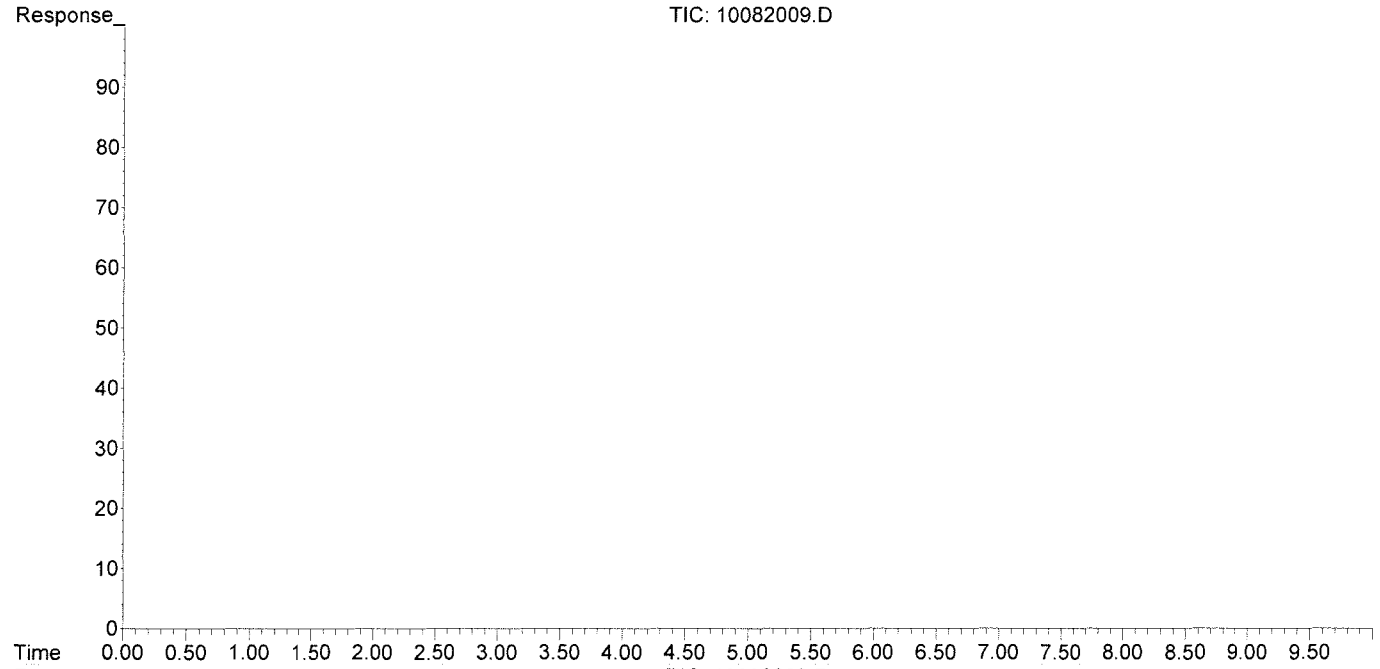
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.118	10348	1.141	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

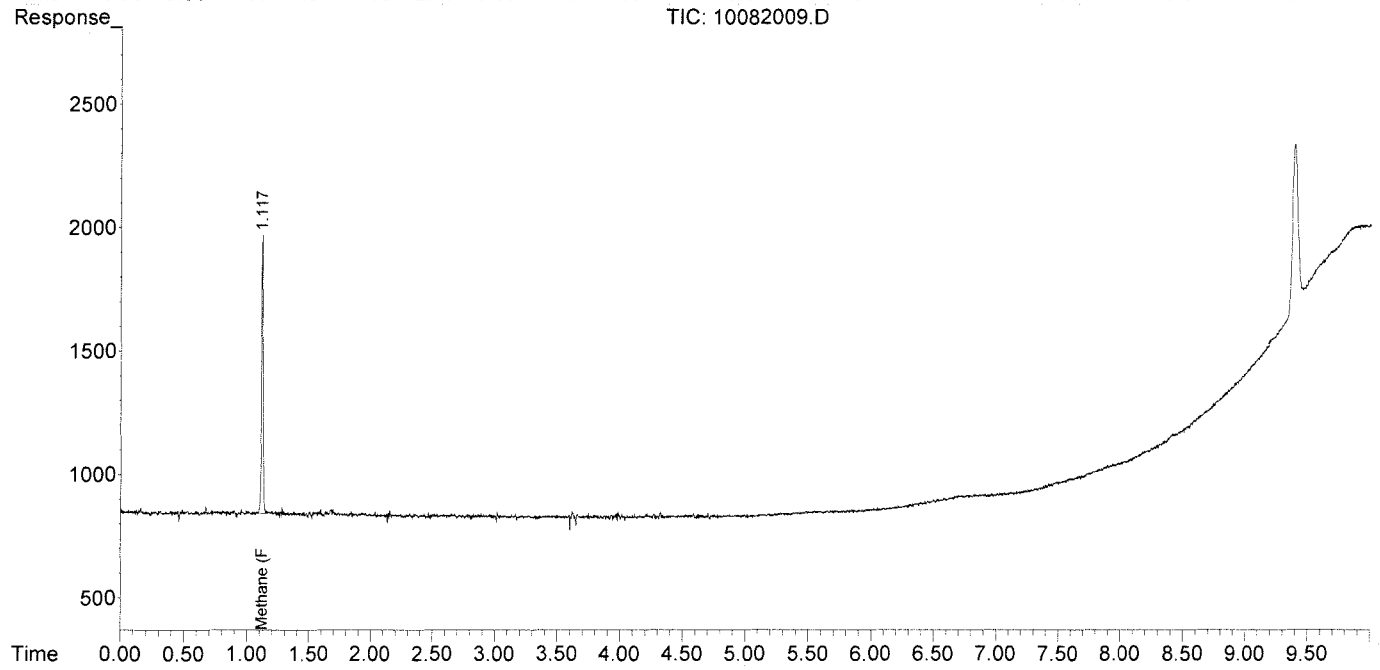
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082009.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 13:34:41
Operator : WH
Sample : P2005613-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 14:10:24 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082010.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 13:50:37
Operator : WH
Sample : P2005613-001ms 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 14:10:08 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

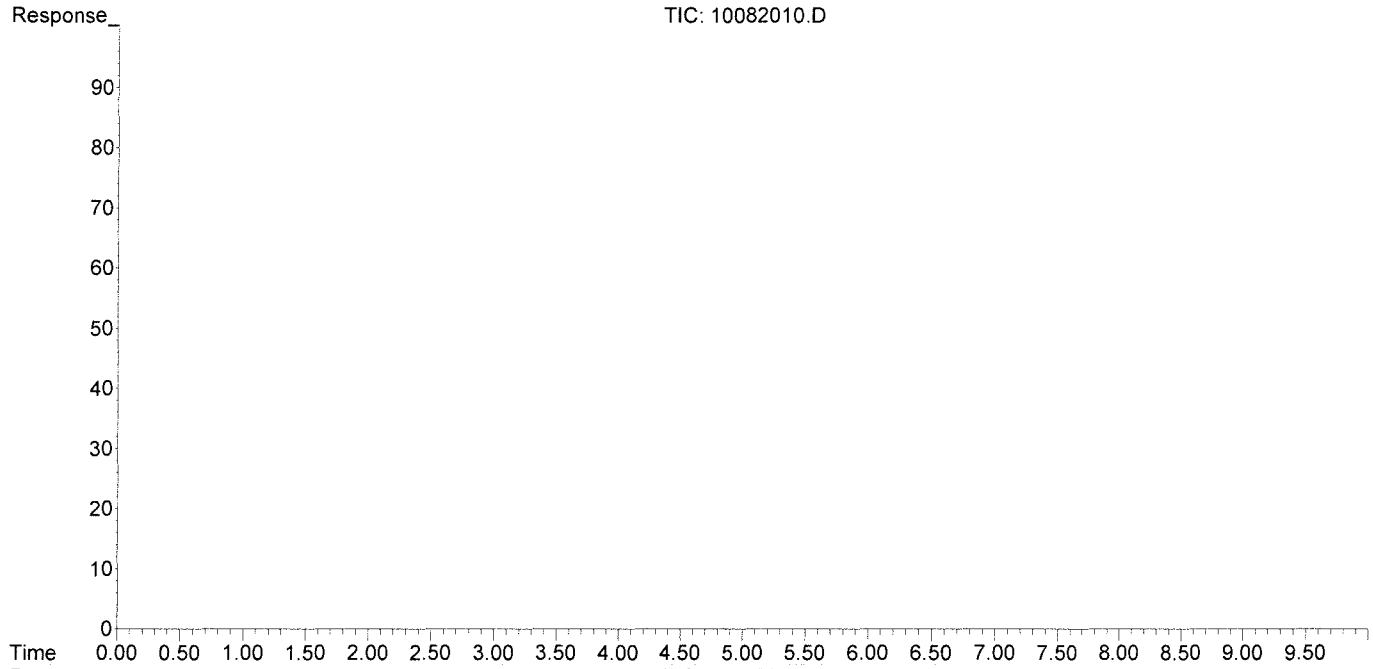
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.117	654642	72.172	ppm
7)	Ethylene	1.684	1102515	65.883	ppm
8)	Ethane	1.948	1234629	72.839	ppm
9)	Propylene	4.315	1549569	66.132	ppm
10)	Propane	4.436	1861020	74.799	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

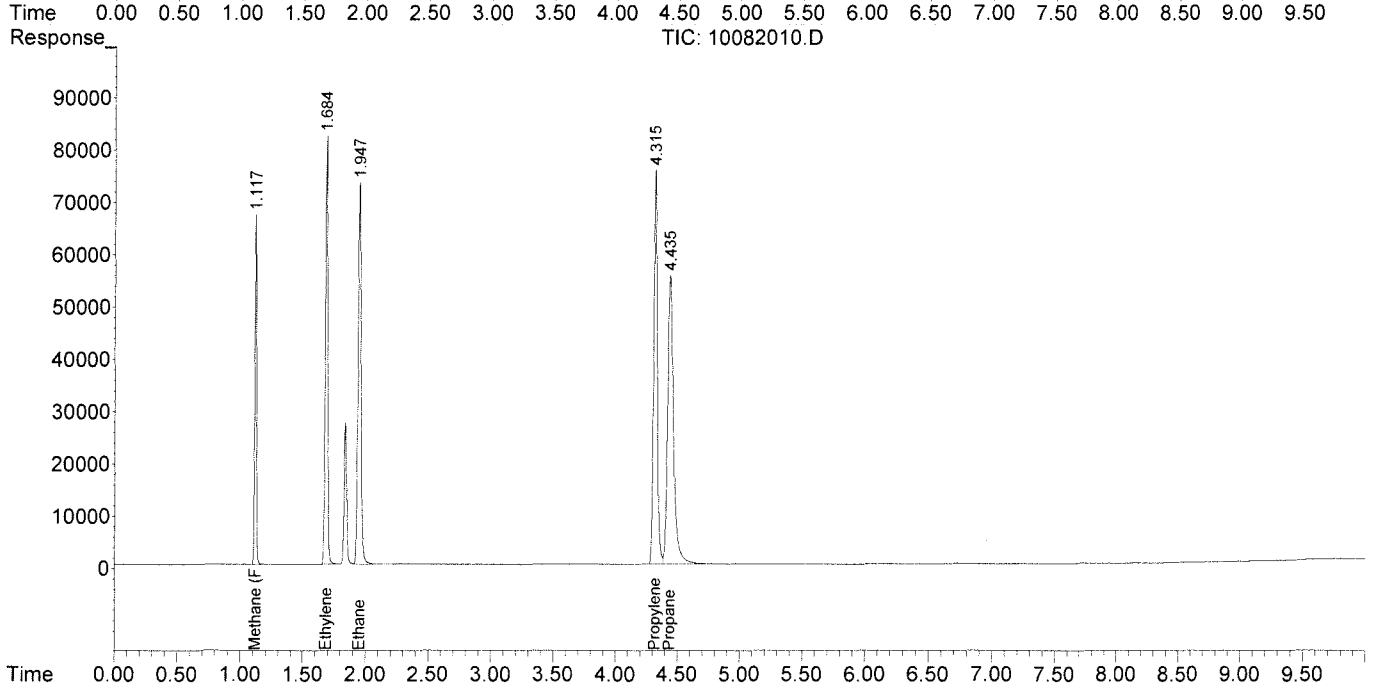
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082010.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 13:50:37
Operator : WH
Sample : P2005613-001ms 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 14:10:08 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082011.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 14:11:07
Operator : WH
Sample : P2005613-001msd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 15:02:58 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

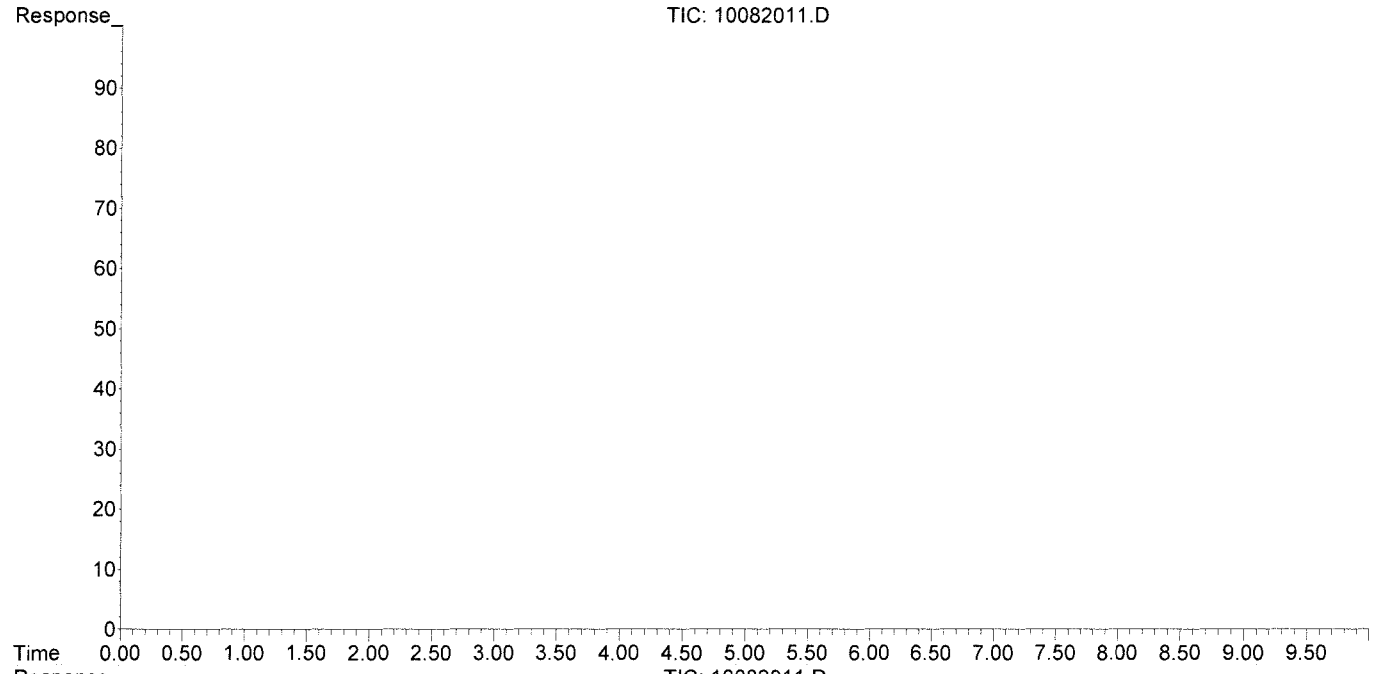
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.118	654517	72.158	ppm
7)	Ethylene	1.684	1091606	65.232	ppm
8)	Ethane	1.947	1232294	72.701	ppm
9)	Propylene	4.313	1536892	65.591	ppm
10)	Propane	4.433	1859966	74.757	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

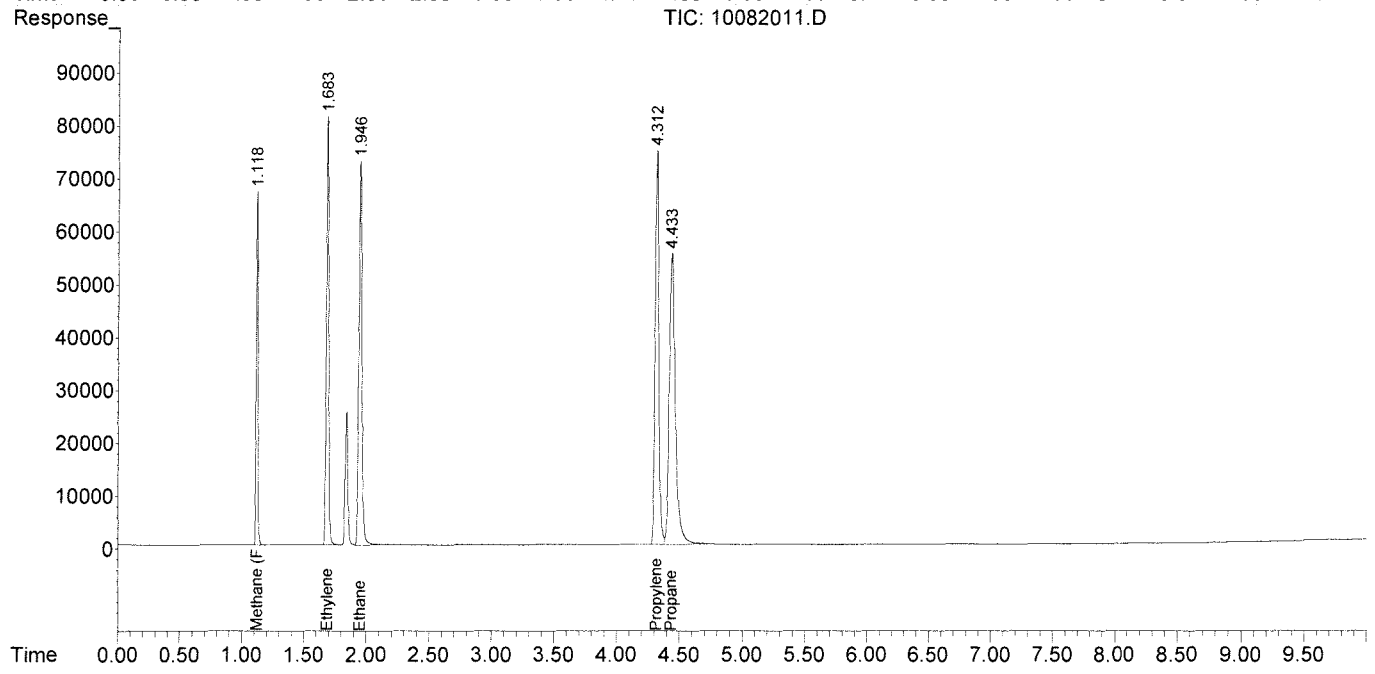
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082011.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 14:11:07
Operator : WH
Sample : P2005613-001msd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 15:02:58 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082004.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:25:34
Operator : WH
Sample : P2005613-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 12:54:10 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

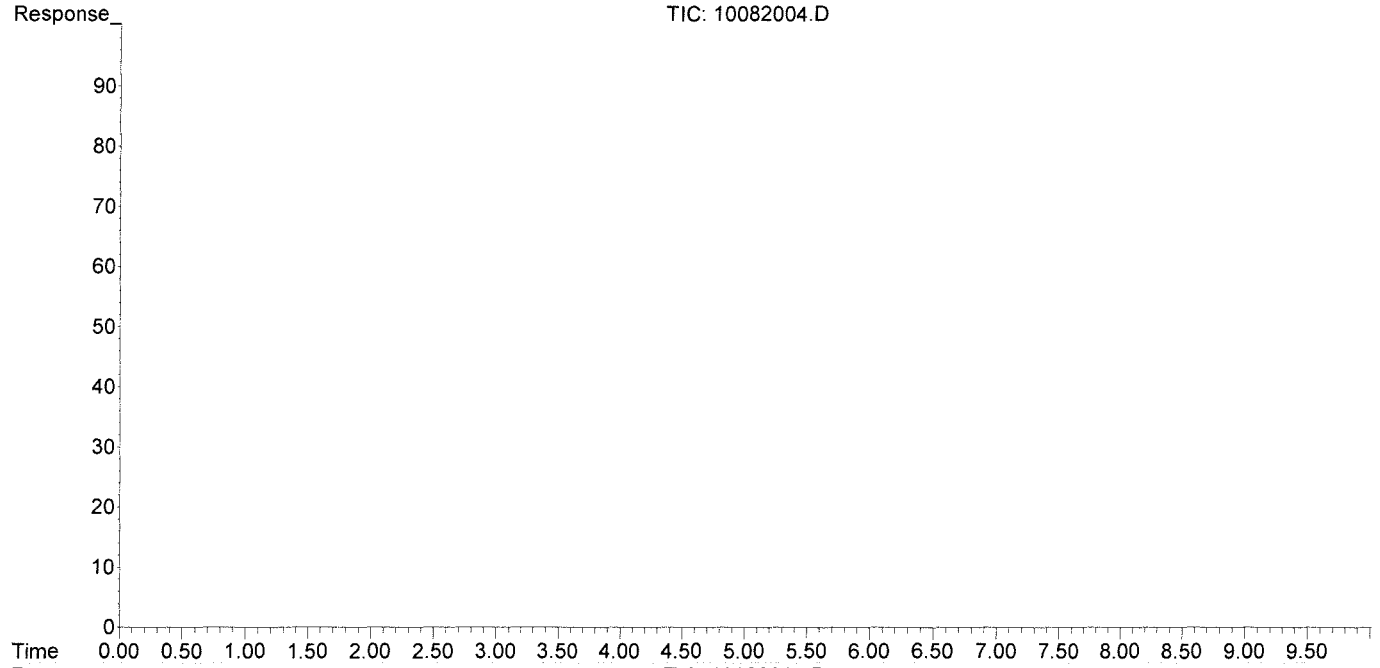
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.119	20137	2.220	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	6.387f	2138	328.015	ppm
12)	Isobutane	6.677	4773	0.179	ppm
13)	n-Butane	6.677	4773	0.179	ppm

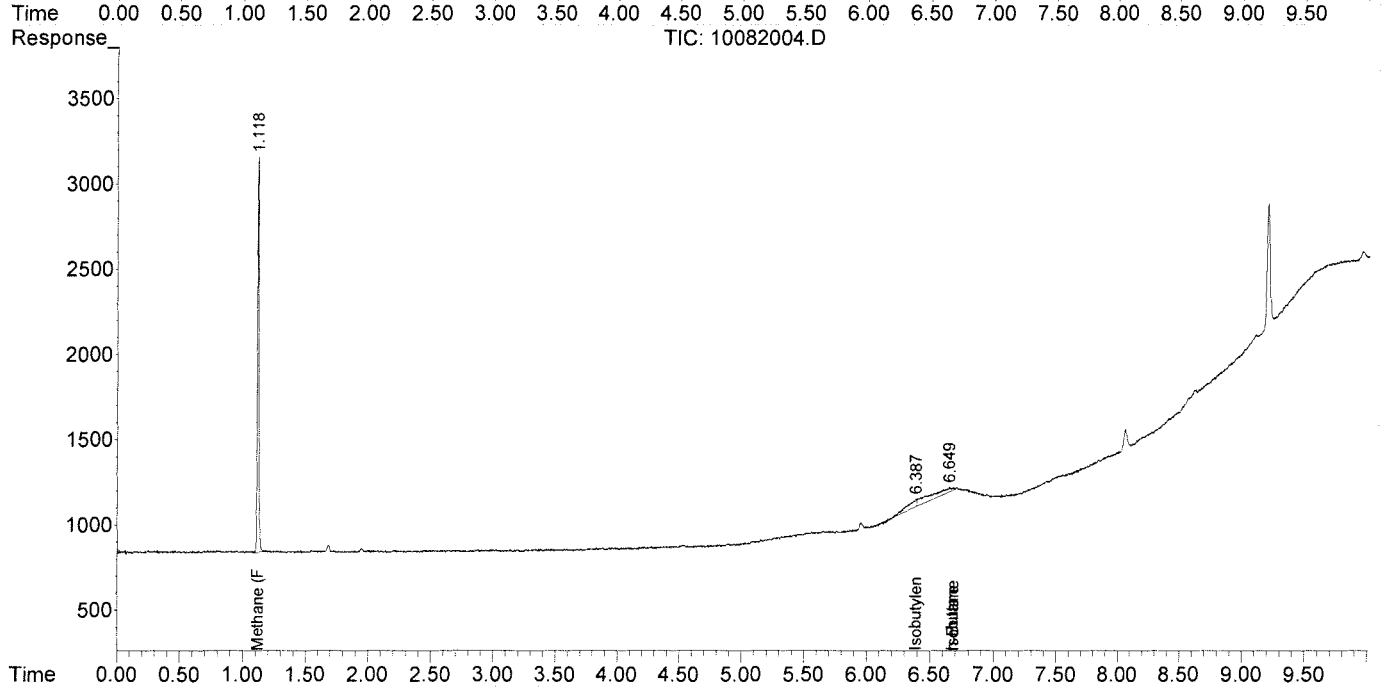
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082004.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:25:34
Operator : WH
Sample : P2005613-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 12:54:10 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082005.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:39:23
Operator : WH
Sample : P2005613-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 12:57:00 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

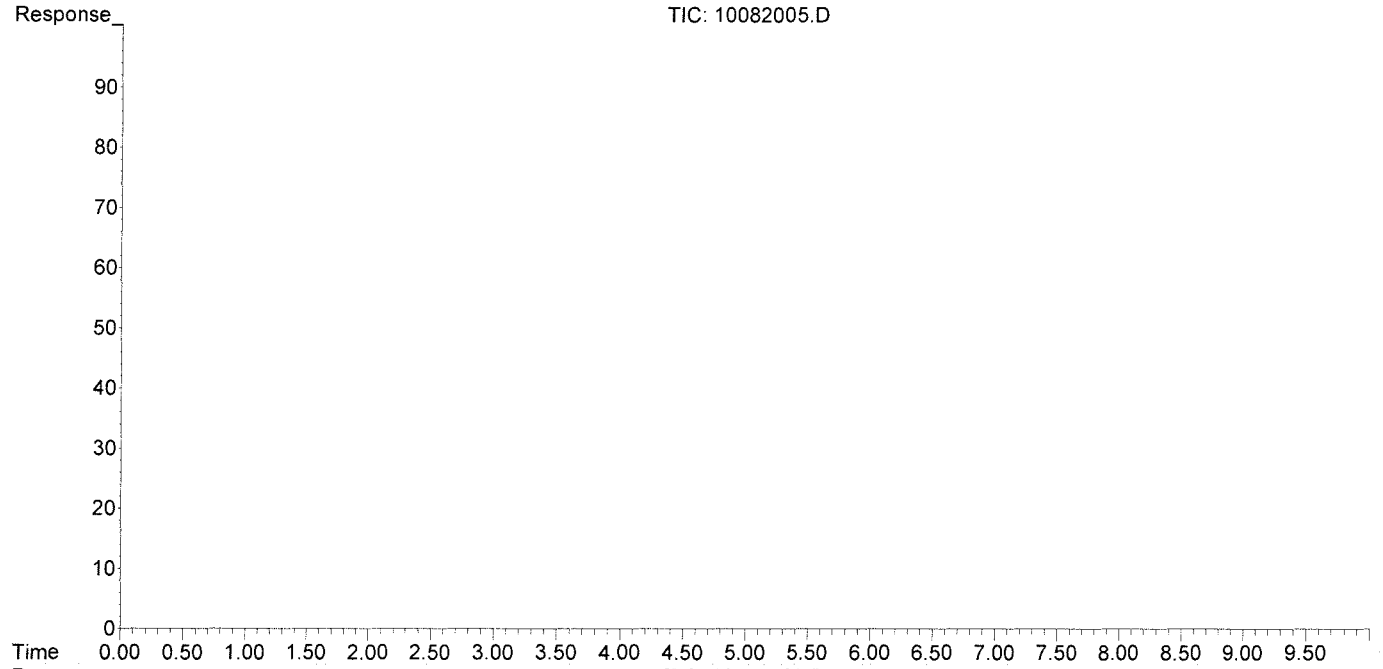
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.111	21851	2.409	ppm	
7)	Ethylene	1.678	533	0.032	ppm	m
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.738	9757	0.367	ppm	
13)	n-Butane	6.738	9757	0.367	ppm	

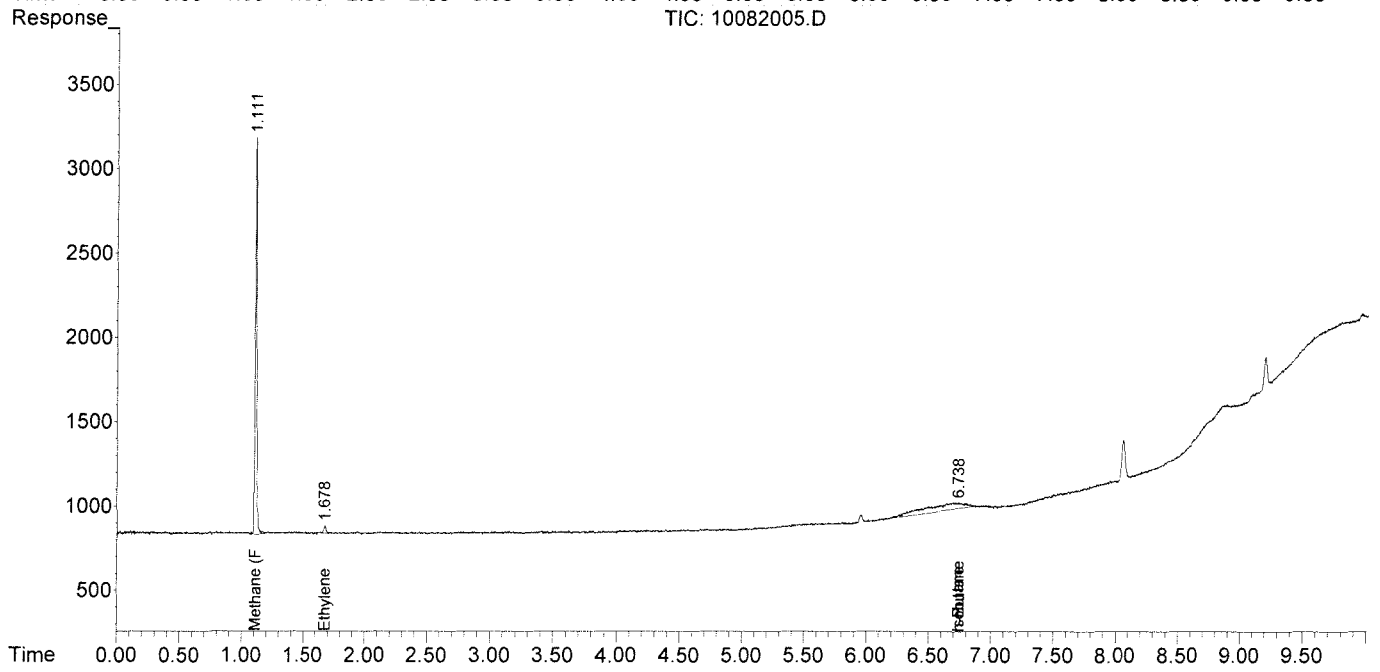
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082005.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:39:23
Operator : WH
Sample : P2005613-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 12:57:00 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



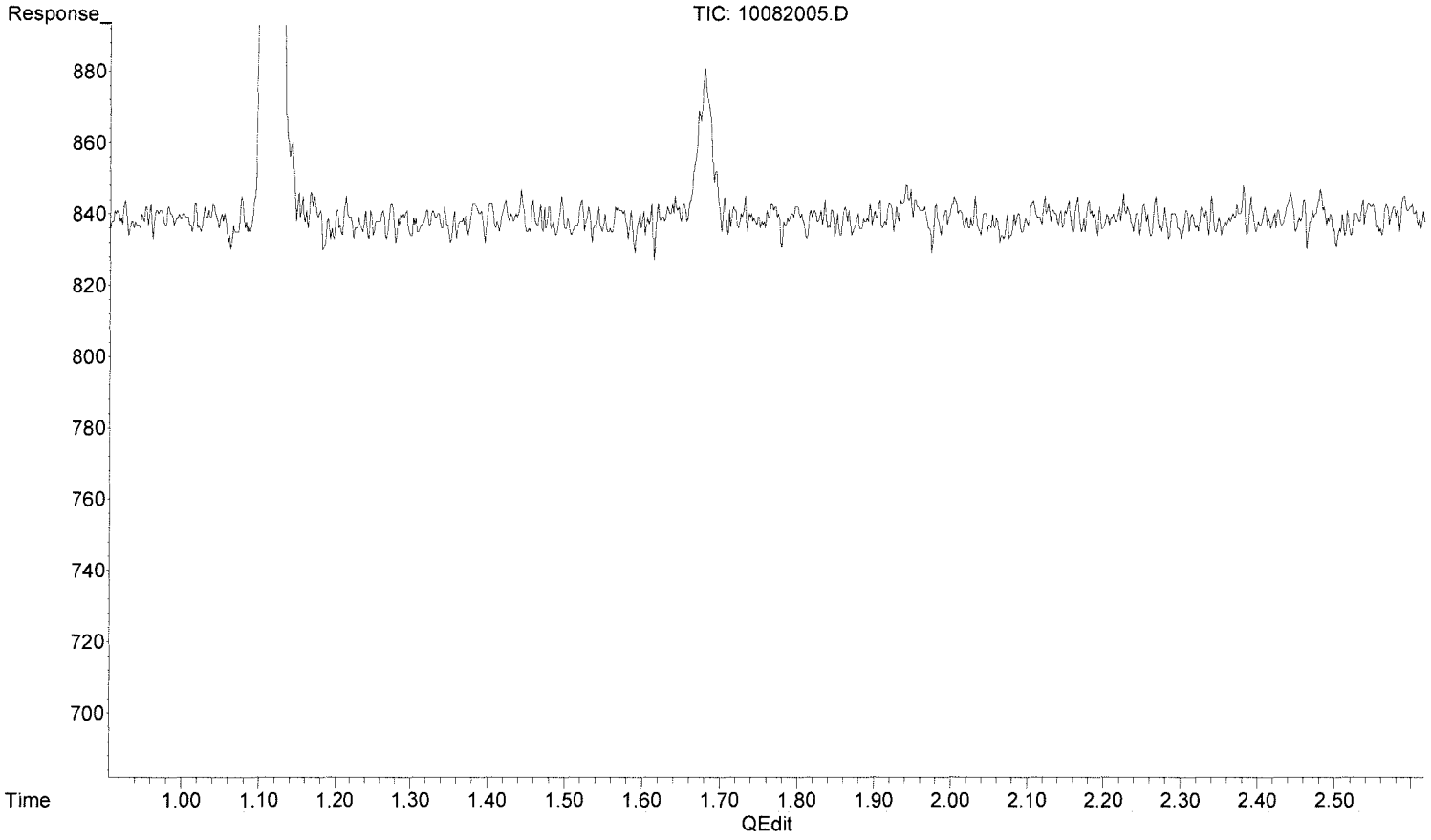


01078160

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082005.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:39:23
Operator : WH
Sample : P2005613-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 12:57:00 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(7) Ethylene

1.668min 0.000 ppm

response 0

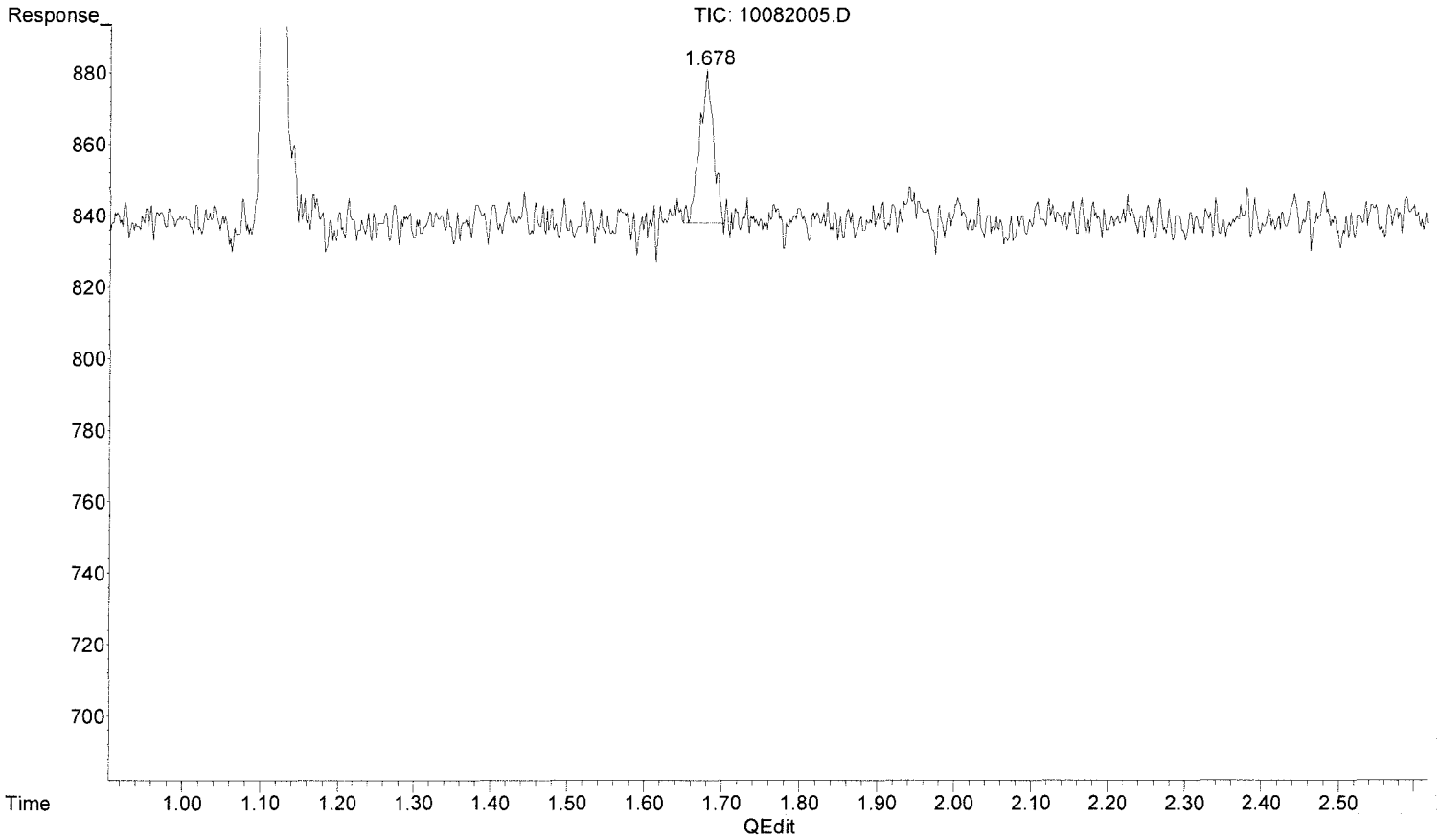
(+) = Expected Retention Time

01078161

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082005.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:39:23
Operator : WH
Sample : P2005613-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 12:57:00 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(7) Ethylene

1.678min 0.032 ppm m

response 533

MR 10/14/20

(+) = Expected Retention Time

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082006.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:53:36
Operator : WH
Sample : P2005613-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 13:04:43 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

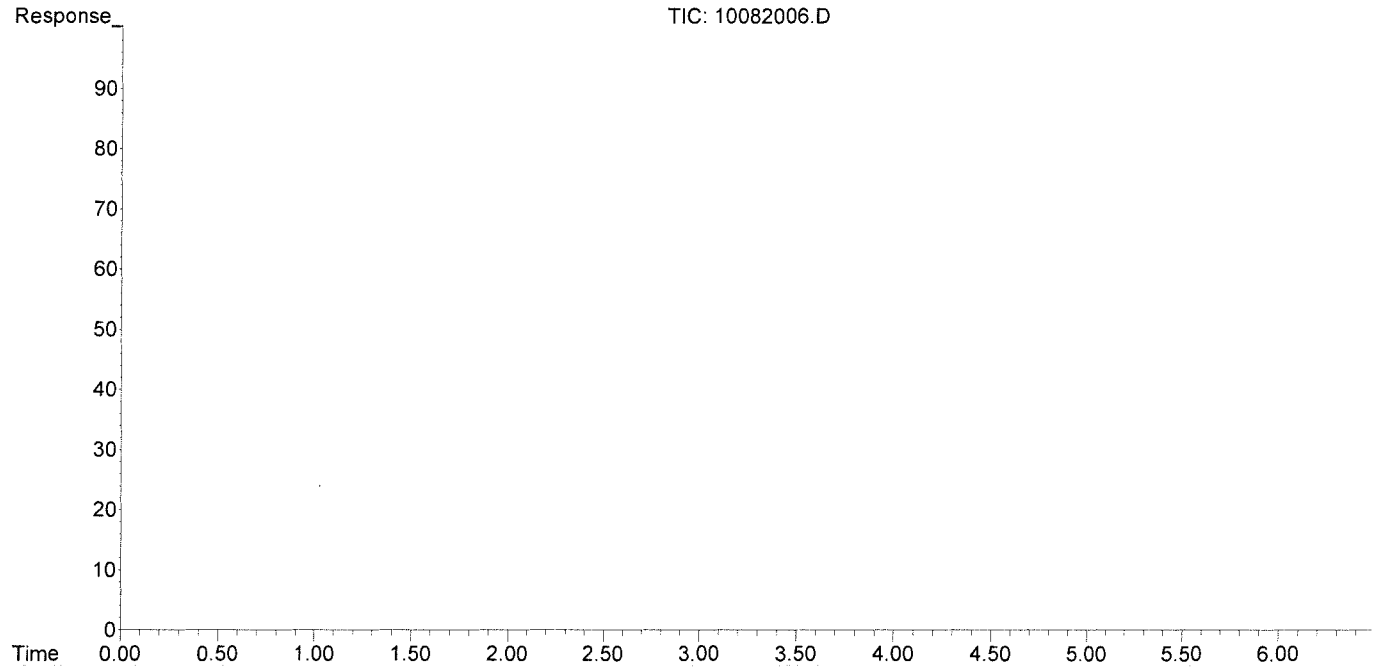
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.101	24300	2.679	ppm	
7)	Ethylene	1.665	663	0.040	ppm	m
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

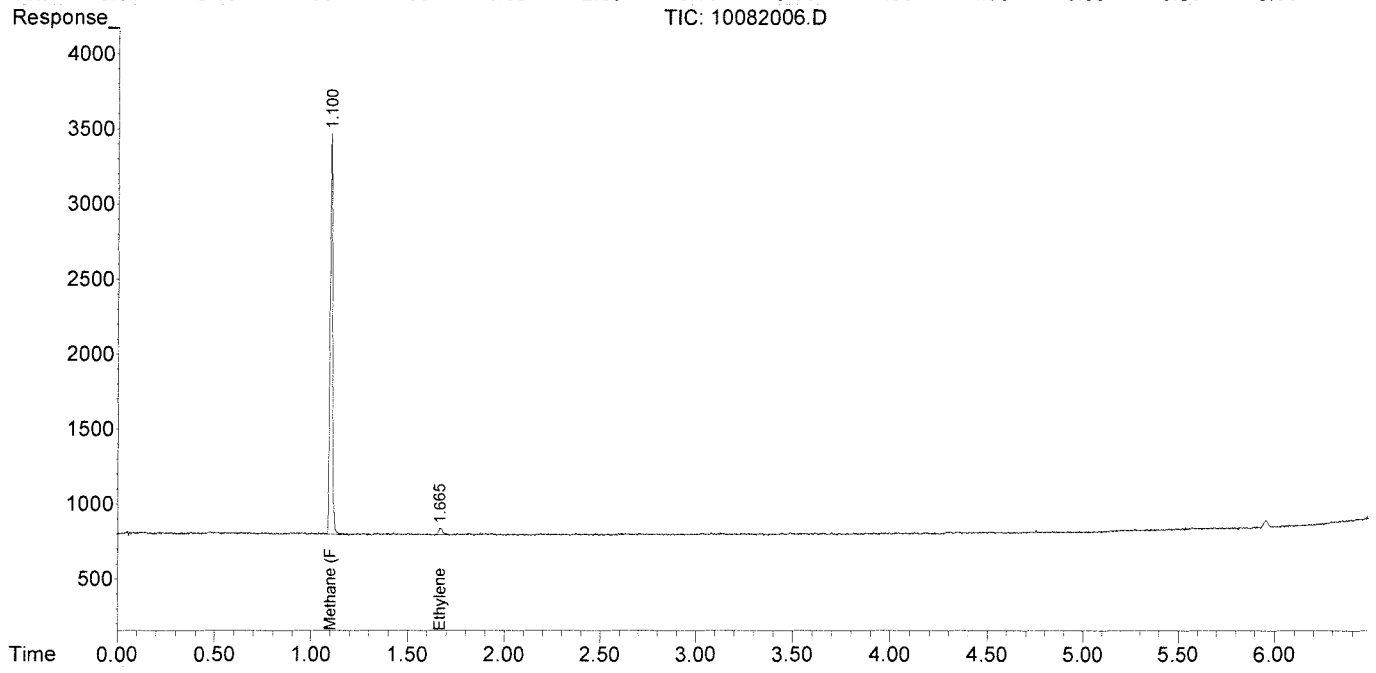
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082006.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:53:36
Operator : WH
Sample : P2005613-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 13:04:43 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



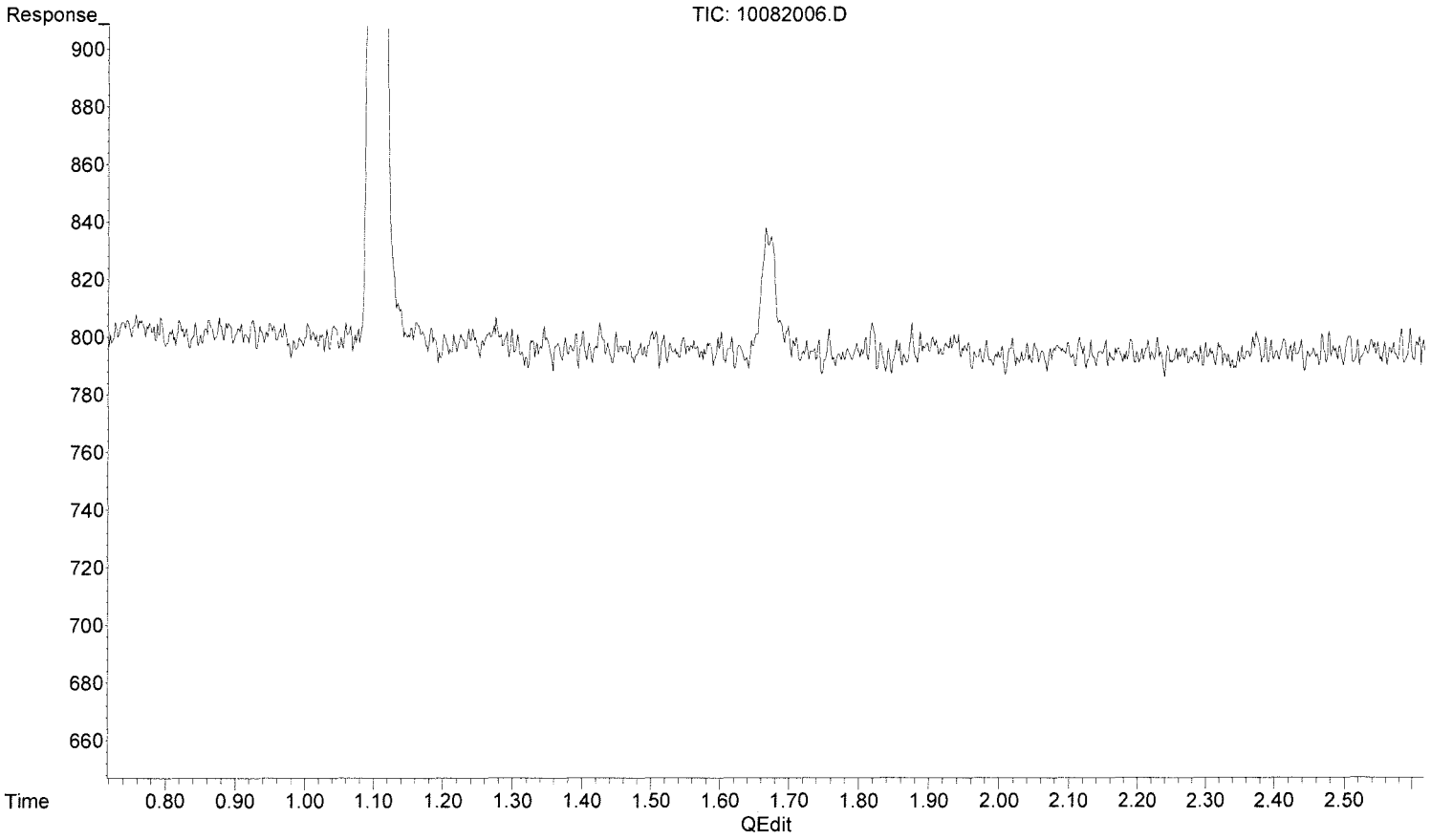


01078164

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082006.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:53:36
Operator : WH
Sample : P2005613-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 13:04:43 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(7) Ethylene

1.668min 0.000 ppm

response 0

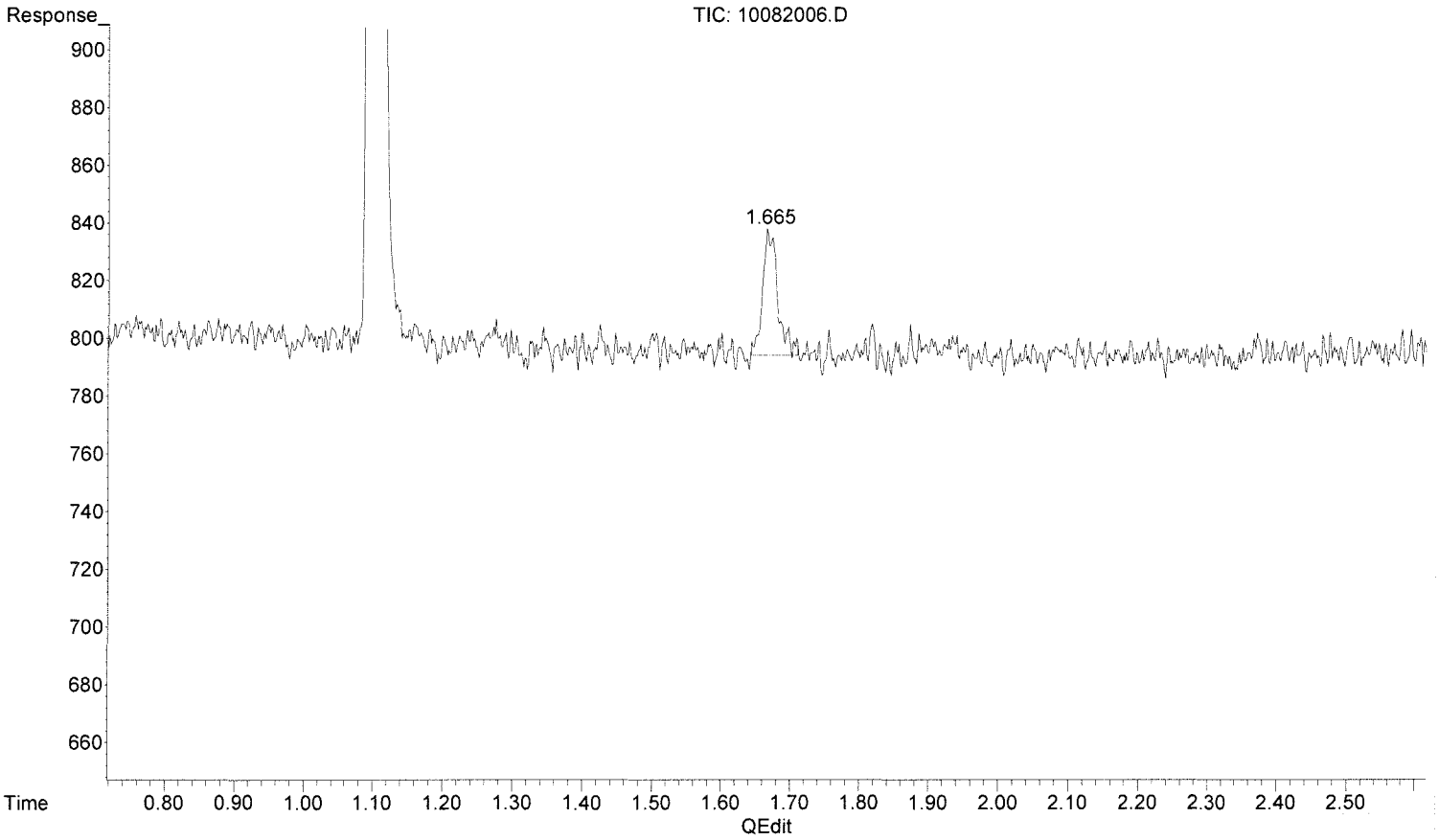
(+) = Expected Retention Time

01078165

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082006.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:53:36
Operator : WH
Sample : P2005613-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 13:04:43 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(7) Ethylene

1.665min 0.040 ppm m

response 663

MR 10/14/20

(+) = Expected Retention Time
RS091217_R.M Wed Oct 14 13:17:55 2020

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082007.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 13:02:07
Operator : WH
Sample : P2005613-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 14:09:46 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

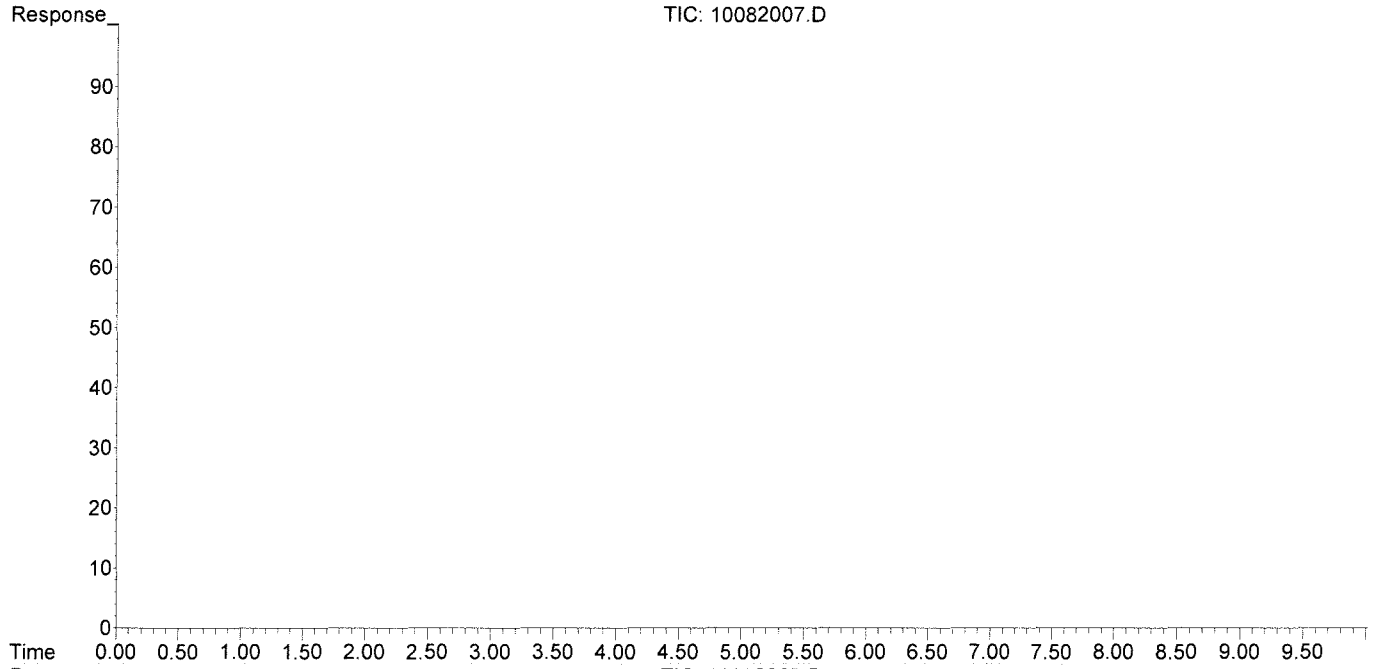
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.116	18334	2.021	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.739	5001	0.188	ppm
13)	n-Butane	6.739	5001	0.188	ppm

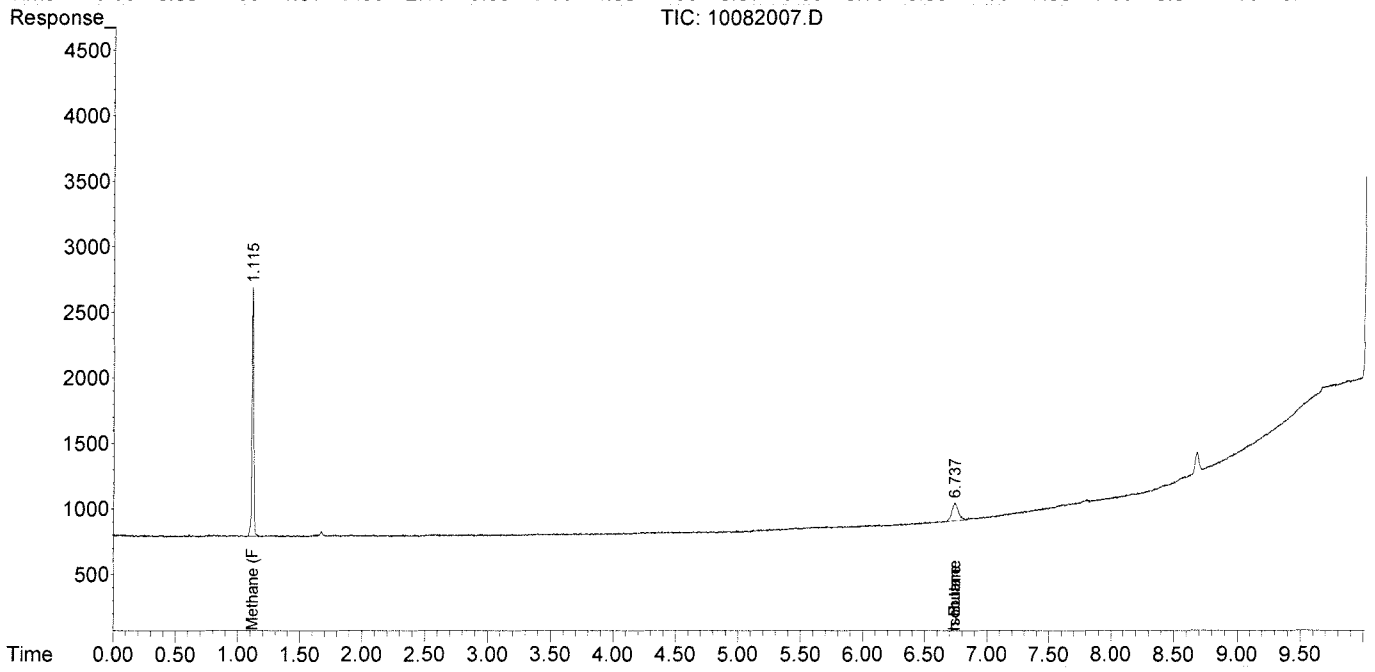
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082007.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 13:02:07
Operator : WH
Sample : P2005613-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 14:09:46 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082008.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 13:23:46
Operator : WH
Sample : P2005613-006 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 13:18:40 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

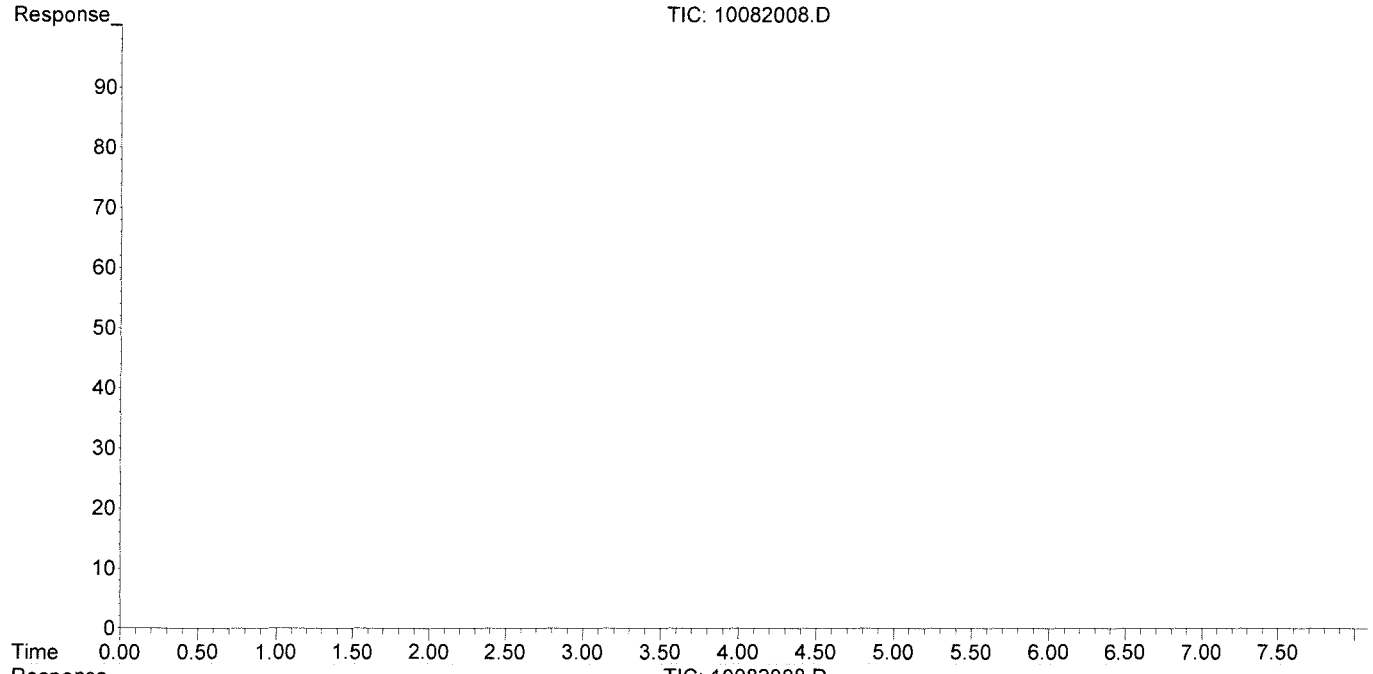
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.120	3970	0.438	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

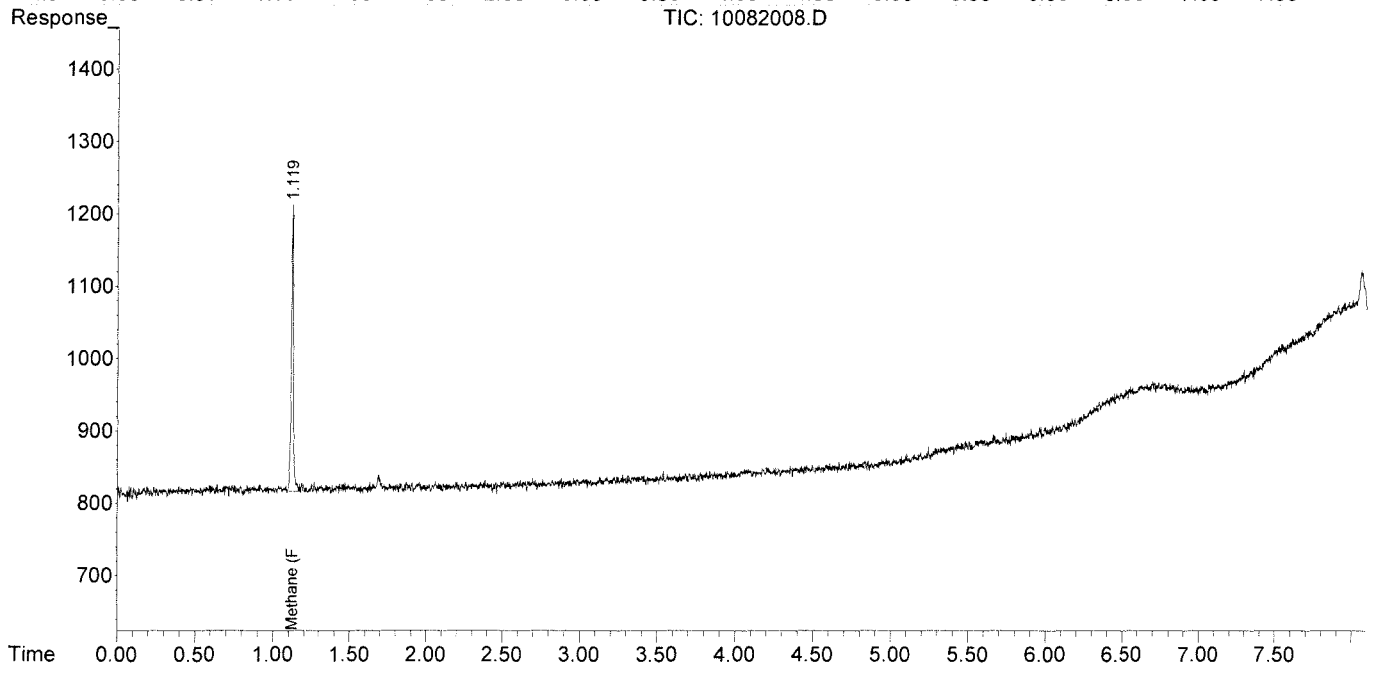
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082008.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 13:23:46
Operator : WH
Sample : P2005613-006 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 13:18:40 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (Not Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082003.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:03:51
Operator : WH
Sample : mcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 12:53:46 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

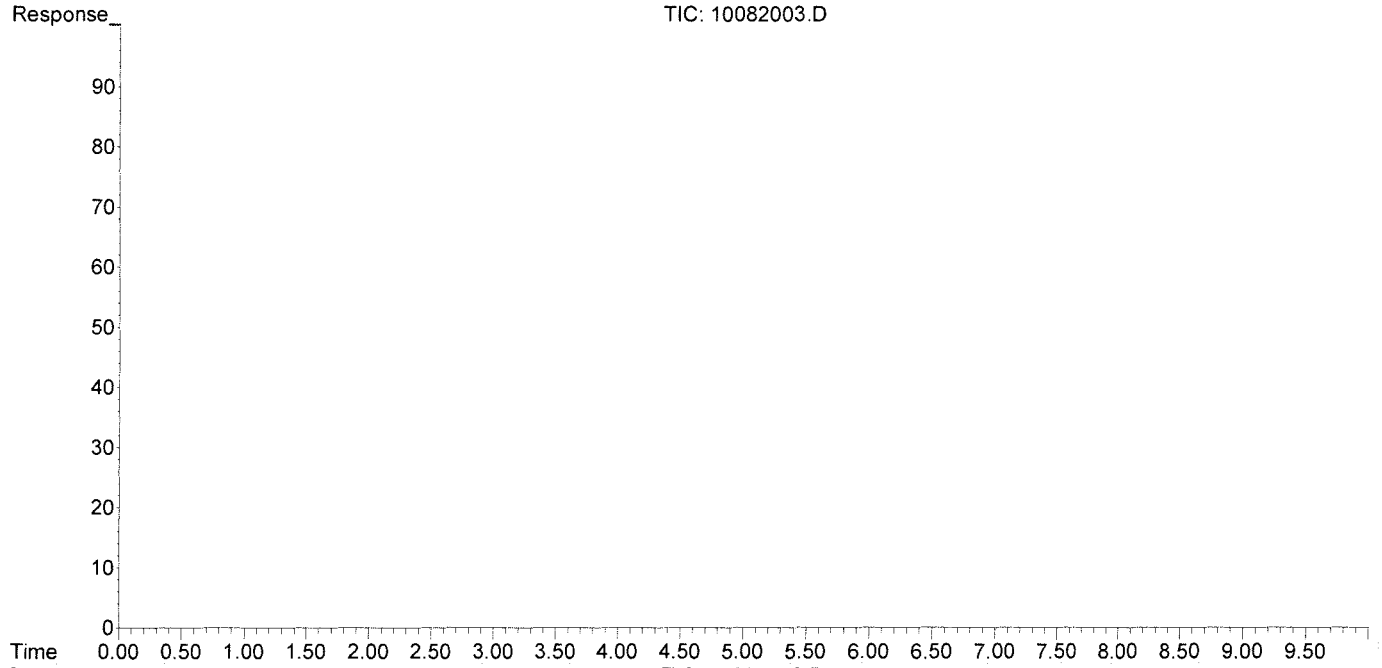
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.720	28150	1.058	ppm
13)	n-Butane	6.720	28150	1.058	ppm

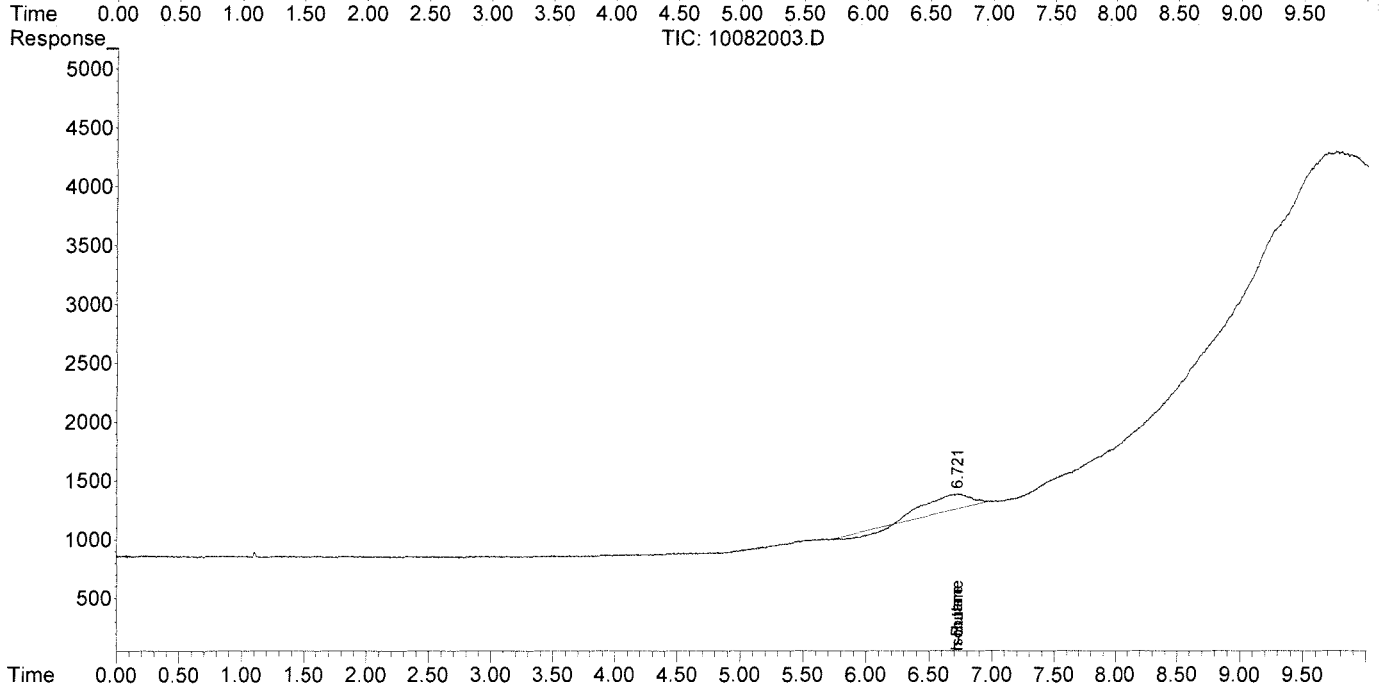
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082003.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:03:51
Operator : WH
Sample : mcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 12:53:46 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082012.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 14:31:22
Operator : WH
Sample : fid lcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 15:03:16 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

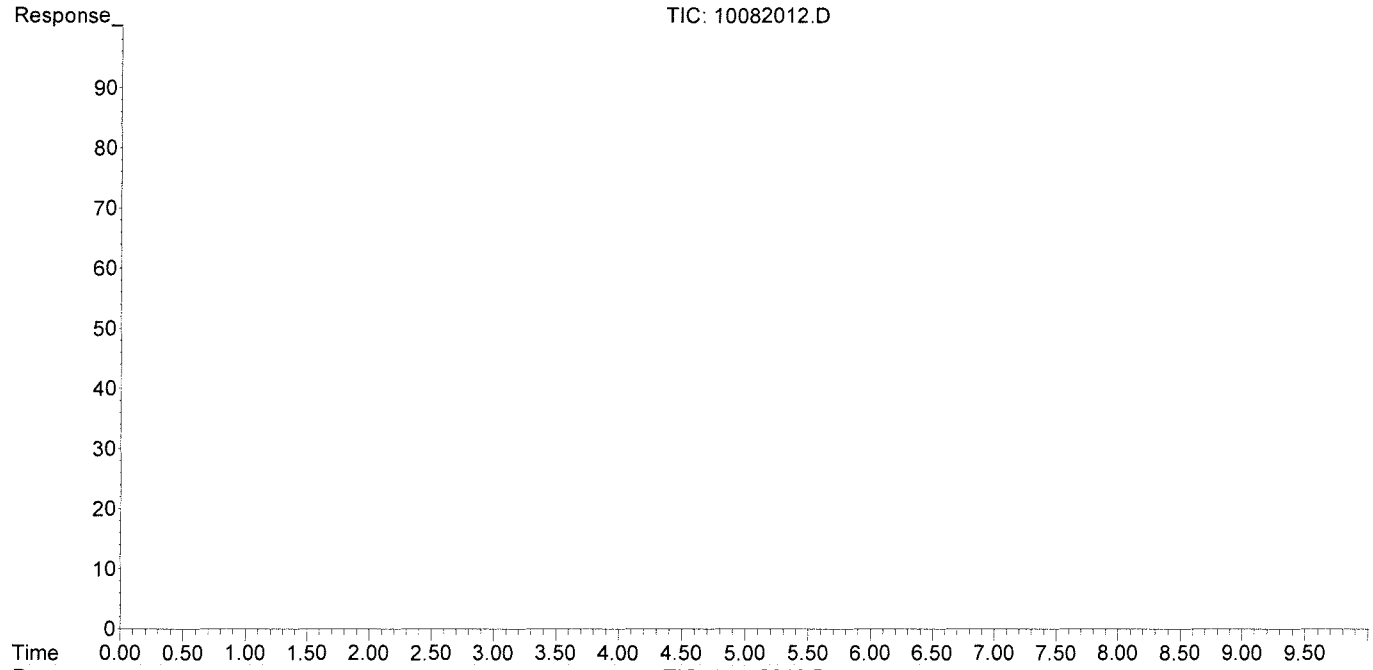
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.118	13367	1.474	ppm
7)	Ethylene	1.685	20418	1.220	ppm
8)	Ethane	1.948	22564	1.331	ppm
9)	Propylene	4.318	27877	1.190	ppm
10)	Propane	4.439	34219	1.375	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.643f	45572	1.712	ppm
13)	n-Butane	6.643f	45572	1.712	ppm

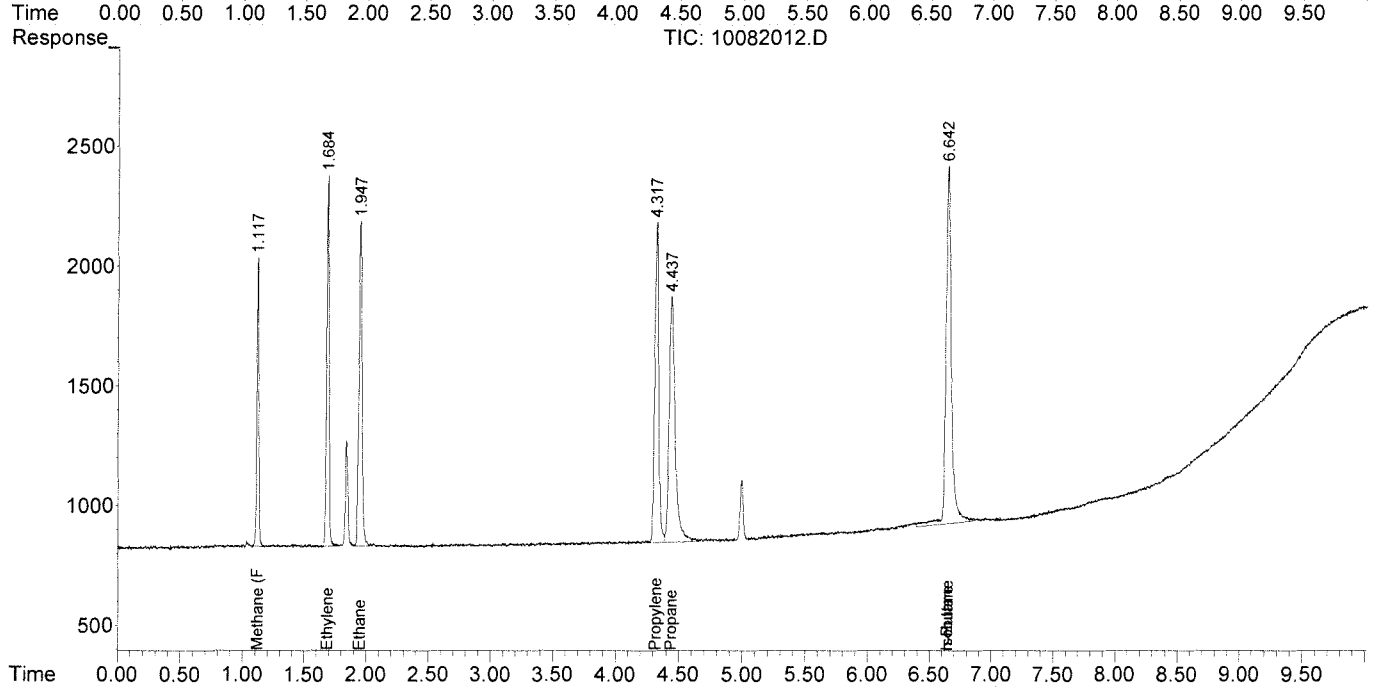
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082012.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 14:31:22
Operator : WH
Sample : fid lcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 15:03:16 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082013.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 15:03:59
Operator : WH
Sample : fid lcsd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 15:18:19 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

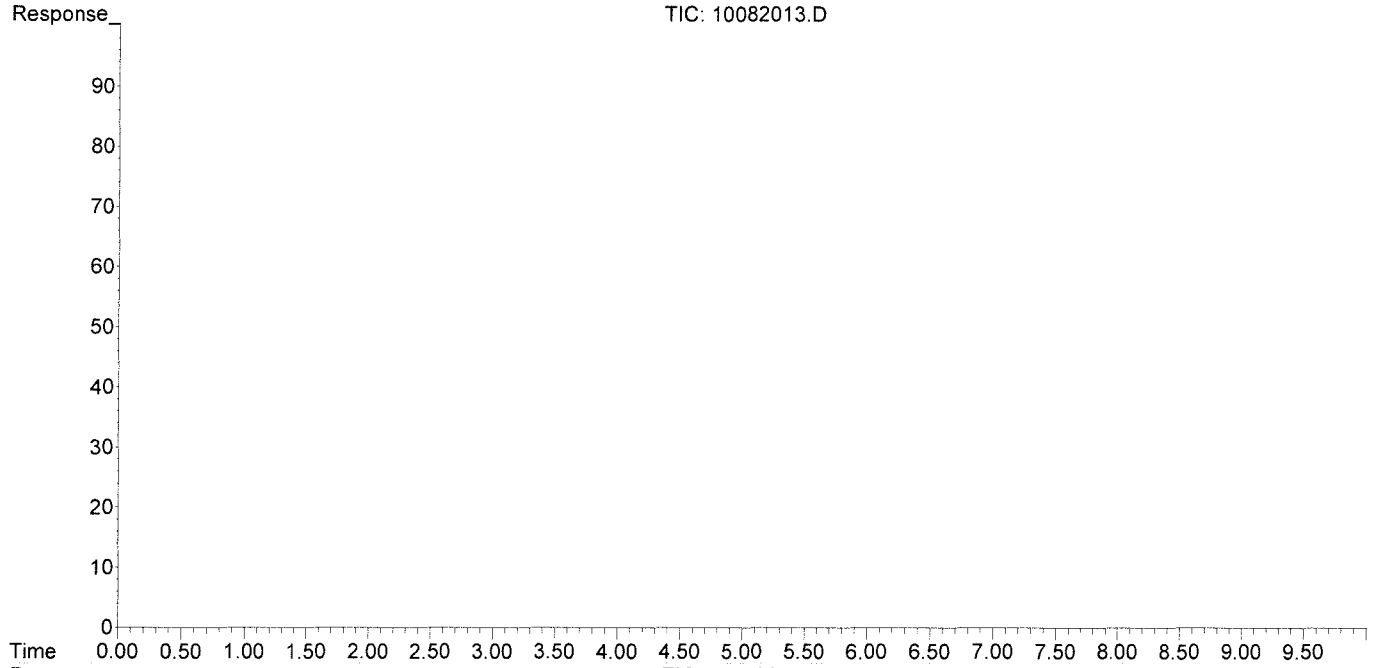
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.119	12263	1.352	ppm
7)	Ethylene	1.685	19015	1.136	ppm
8)	Ethane	1.947	21400	1.263	ppm
9)	Propylene	4.317	25395	1.084	ppm
10)	Propane	4.437	31486	1.265	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.643f	39877	1.498	ppm
13)	n-Butane	6.643f	39877	1.498	ppm

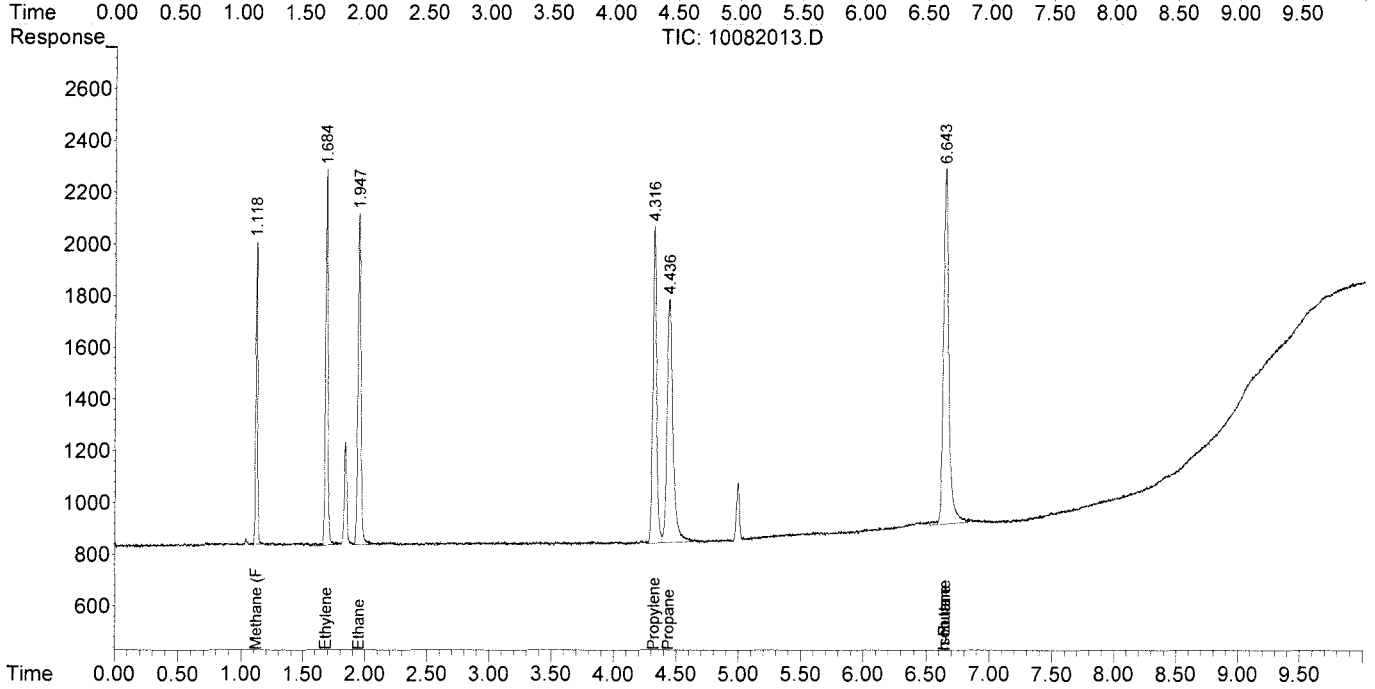
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082013.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 15:03:59
Operator : WH
Sample : fid lcsd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 15:18:19 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Response Factor Report HP5890

Method Path : J:\GC10\METHODS\
Method File : RS091217_R.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Wed Sep 13 11:14:47 2017
Response Via : Initial Calibration

Calibration Files
1 =09121702.D 2 =09121703.D 3 =09121704.D
4 =09121705.D 5 =09121706.D 6 =09121707.D

	Compound	1	2	3	4	5	6	Avg	%RSD
1)	Oxygen/Argon	3.739		1.014				0.001 0.793 E6	189.17
2)	Carbon monoxide	3.739		1.014				0.001 0.594 E6	221.92
3)	Methane (TCD)							2.161 0.951 E2	106.37
4)	Carbon dioxide	2.365	2.569	2.558	2.361	2.459	2.314	2.438 E2	4.44

Signal #2 Calibration Files
1 =09121702.D 2 =09121703.D 3 =09121704.D
4 =09121705.D 5 =09121706.D 6 =09121707.D

	Compound	1	2	3	4	5	6	Avg	%RSD
6)	Methane (FID)		1.180	0.975	0.908	0.870	0.868	0.907 E4	11.66
7)	Ethylene	1.736	1.638	1.780	1.720	1.628	1.670	1.673 E4	3.90
8)	Ethane	1.781	1.676	1.784	1.730	1.692	1.675	1.695 E4	3.83
9)	Propylene	2.505	2.296	2.592	2.480	2.346	2.252	2.343 E4	6.56
10)	Propane	2.439	2.283	2.645	2.555	2.433	2.522	2.488 E4	4.20
11)	Isobutylene							0.652 E1	138.46
12)	Isobutane	6.058	4.793	2.214	1.553	1.353		2.662 E4	86.17
13)	n-Butane	6.058	4.793	2.214	1.553	1.353		2.662 E4	86.17

(#) = Out of Range ### Number of calibration levels exceeded format ###

RS091217_R.M Wed Sep 13 15:11:48 2017

Edit Compounds -- Compound #6 -- Methane (FID)

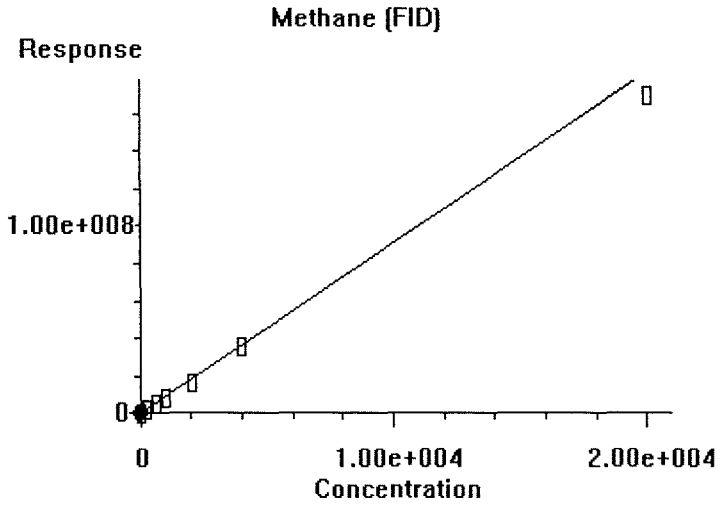
Search by: Ret Time Name Index Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	
2	0.302000	3564.400000
3	1.510000	14725.268625
4	4.530000	41128.575000
5	10.570000	91966.784531
6	200.000000	1735997.497500
7	600.000000	5189848.900000
8	1000.000000	8598533.570000
9	2000.000000	16098209.390000
10	4000.000000	35776839.311362

Lvl ID	Concentration	Response
11	20000.000000	169009160.49199



0.000e+000	Quadratic term
9.071e+003	Linear term
0.000e+000	Constant term
11.657%	RF Rel Std Dev

OK Cancel Help Print Calibration Curve Copy Calibration Curve

Edit Compounds -- Compound #7 -- Ethylene

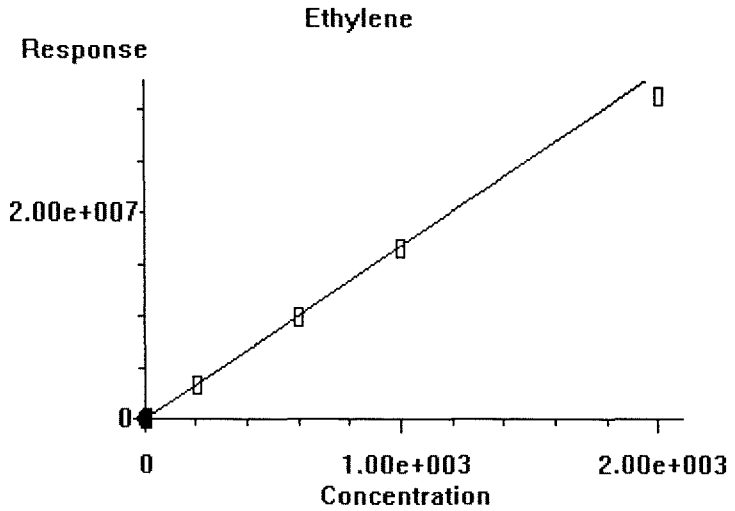
Search by: Ret Time Name Index Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	2621.970000
2	0.302000	4946.731301
3	1.510000	26884.746847
4	4.530000	77902.721497
5	10.570000	172085.529560
6	200.000000	3339702.313219
7	600.000000	10007758.776971
8	1000.000000	16608503.805988
9	2000.000000	31192443.898600
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
1.673e+004	Linear term
0.000e+000	Constant term
3.897%	RF Rel Std Dev

OK Cancel Help Print Calibration Curve Copy Calibration Curve

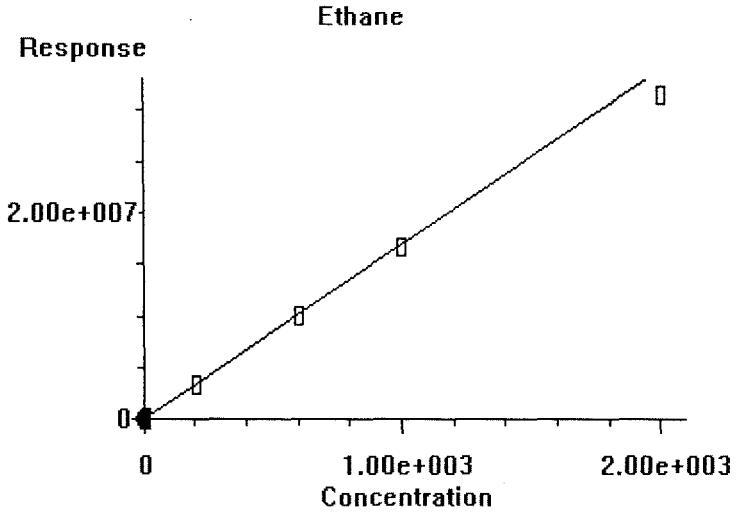
Edit Compounds -- Compound #8 -- Ethane

Search by: Ret Time Name Index Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response	Lvl ID	Concentration	Response
1	0.151000	2689.928008	11	20000.000000	
2	0.302000	5060.331943			
3	1.510000	26943.667500			
4	4.530000	78353.525045			
5	10.570000	178840.731148			
6	200.000000	3350442.319129			
7	600.000000	10048964.218029			
8	1000.000000	16709164.879012			
9	2000.000000	31424217.938900			
10	4000.000000				



0.000e+000	Quadratic term
1.695e+004	Linear term
0.000e+000	Constant term
3.831%	RF Rel Std Dev

OK Cancel Help Print Calibration Curve Copy Calibration Curve

Edit Compounds -- Compound #9 -- Propylene

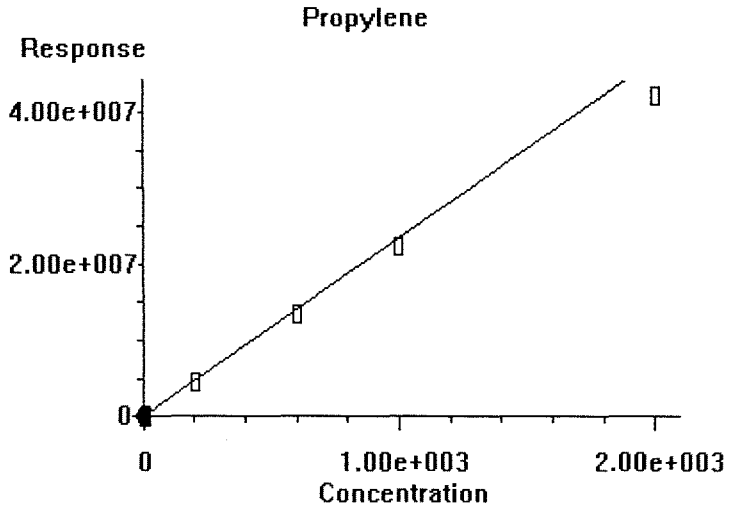
Search by: Ret Time | Name | Index | Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	3782.537646
2	0.302000	6933.285530
3	1.510000	39139.518208
4	4.530000	112341.896872
5	10.570000	248003.903623
6	200.000000	4504060.086084
7	600.000000	13569342.761419
8	1000.000000	22494887.720990
9	2000.000000	42124689.656800
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
2.343e+004	Linear term
0.000e+000	Constant term
6.559%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Edit Compounds -- Compound #10 -- Propane

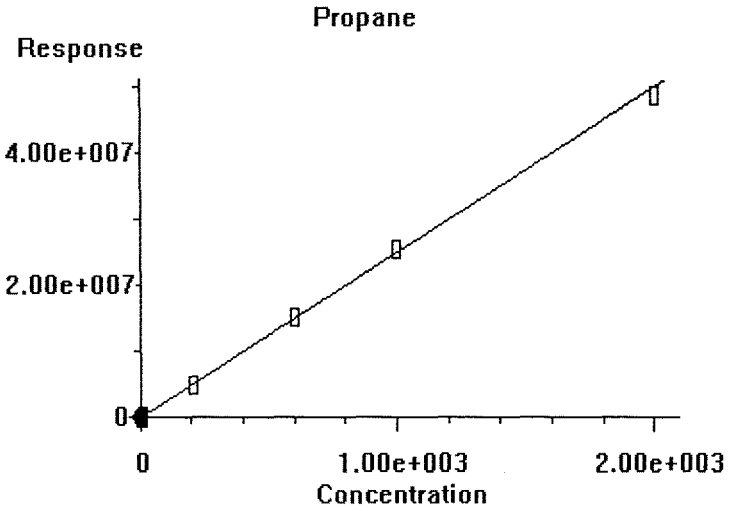
Search by: Ret Time | Name | Index | Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	3682.897354
2	0.302000	6894.237803
3	1.510000	39934.166792
4	4.530000	115723.428128
5	10.570000	257124.432806
6	200.000000	5043035.663916
7	600.000000	15251325.797404
8	1000.000000	25459410.657938
9	2000.000000	48583085.287451
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
2.488e+004	Linear term
0.000e+000	Constant term
4.200%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Calibration Status Report HP5890

Method Path : J:\GC10\METHODS\
Method File : RS091217_R.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Wed Sep 13 11:14:47 2017
Response Via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	1	0	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121702.D
2	2	0	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121703.D
3	3	3	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121704.D
4	4	10	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121705.D
5	5	25	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121706.D
6	6	125	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121707.D
7	7	5000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121708.D
8	8	25000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121709.D
9	9	2000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121710.D
10	10	30000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121711.D
11	11	20000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121712.D

#	ID	Update Time	Quant Time	Acquisition Time
1	1	Sep 13 11:04 2017	Sep 12 15:03 2017	12-Sep-2017, 10:52
2	2	Sep 13 11:05 2017	Sep 13 11:05 2017	12-Sep-2017, 11:05
3	3	Sep 13 11:06 2017	Sep 13 11:05 2017	12-Sep-2017, 11:45
4	4	Sep 13 11:09 2017	Sep 13 11:06 2017	12-Sep-2017, 12:09
5	5	Sep 13 11:09 2017	Sep 13 11:09 2017	12-Sep-2017, 12:30
6	6	Sep 13 11:10 2017	Sep 13 11:10 2017	12-Sep-2017, 12:47
7	7	Sep 13 11:11 2017	Sep 13 11:10 2017	12-Sep-2017, 13:00
8	8	Sep 13 11:12 2017	Sep 13 11:11 2017	12-Sep-2017, 13:47
9	9	Sep 13 11:12 2017	Sep 13 11:12 2017	12-Sep-2017, 14:07
10	10	Sep 13 11:14 2017	Sep 13 11:13 2017	12-Sep-2017, 14:48
11	11	Sep 13 11:14 2017	Sep 13 11:14 2017	12-Sep-2017, 15:21

RS091217_R.M Wed Sep 13 15:11:22 2017

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121702.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 10:52
Operator : MC
Sample : 0.151ppm 0.250ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 12 11:03:15 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.767	373920	0.128	ppm	
2)	Carbon monoxide	1.767	373920	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	1.595	2622	0.156	ppm	
8)	Ethane	1.848	2690	0.156	ppm	
9)	Propylene	4.222	3783	0.154	ppm	
10)	Propane	4.348	3683	0.139	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.582f	6058	NoCal	ppm	
13)	n-Butane	6.582f	6058	NoCal	ppm	

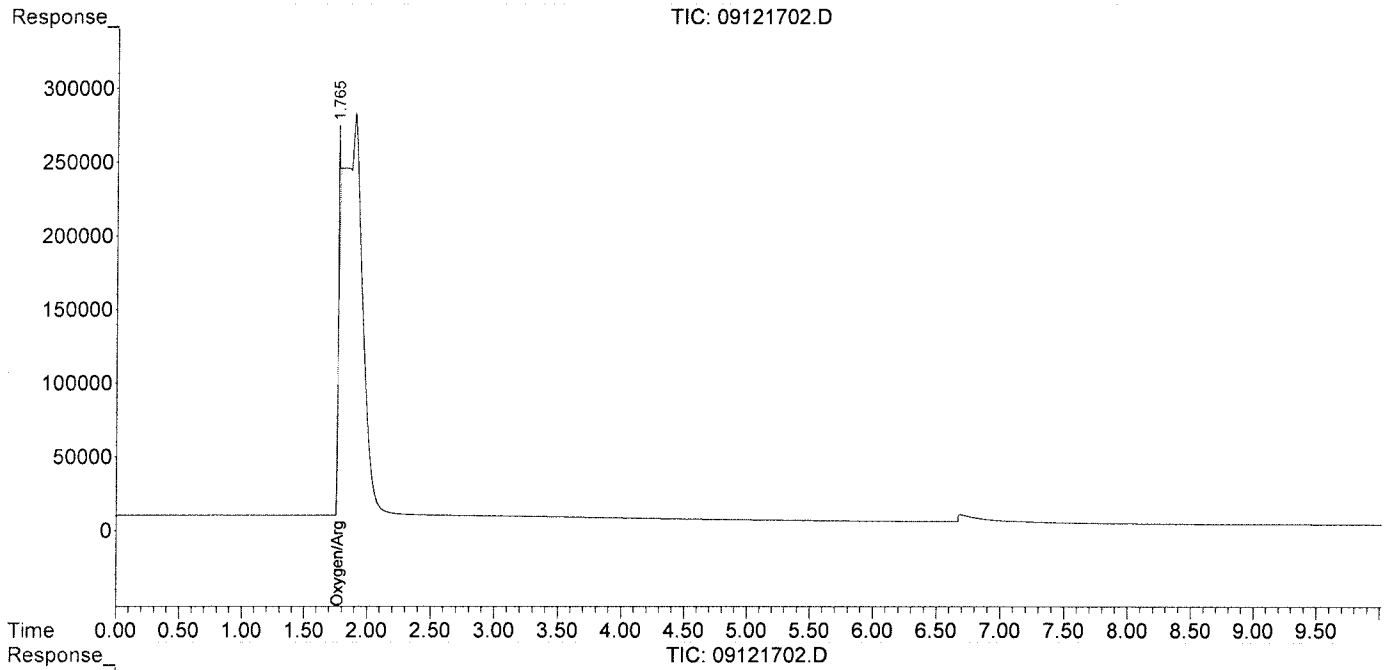
(f)=RT Delta > 1/2 Window (m)=manual int.

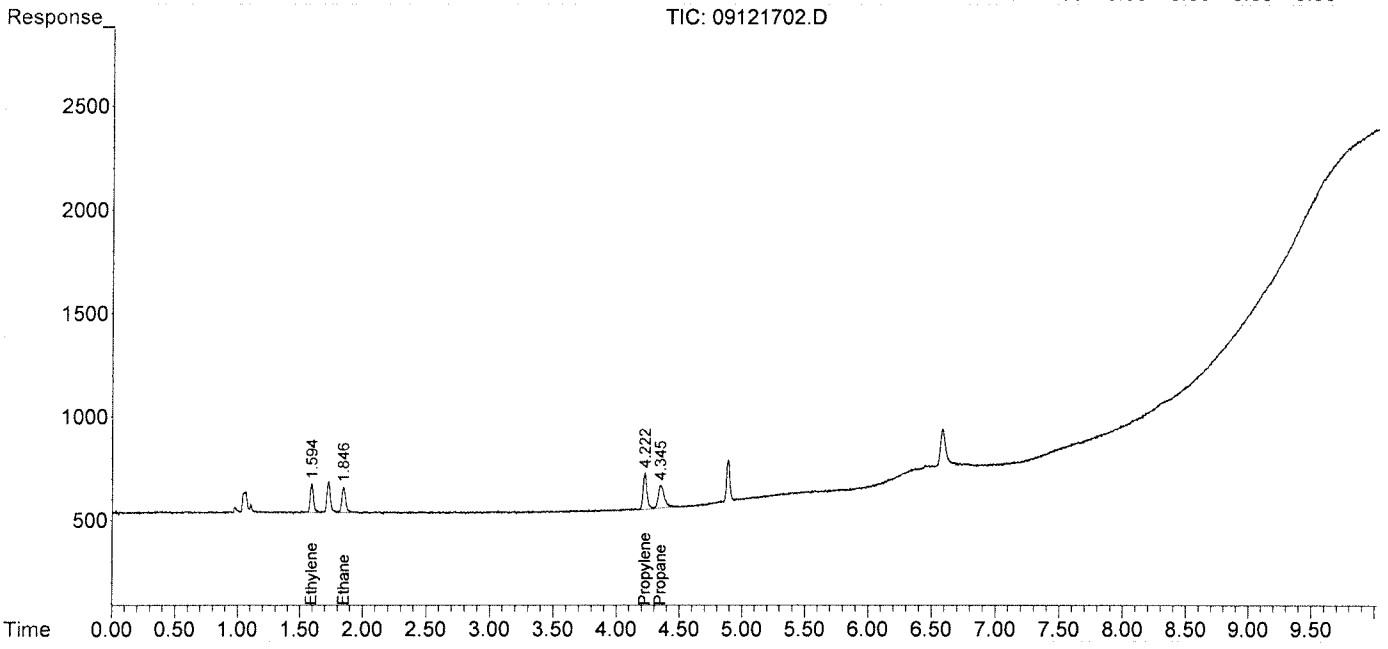
9/13/17

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121702.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 10:52
Operator : MC
Sample : 0.151ppm 0.250ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 12 11:03:15 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

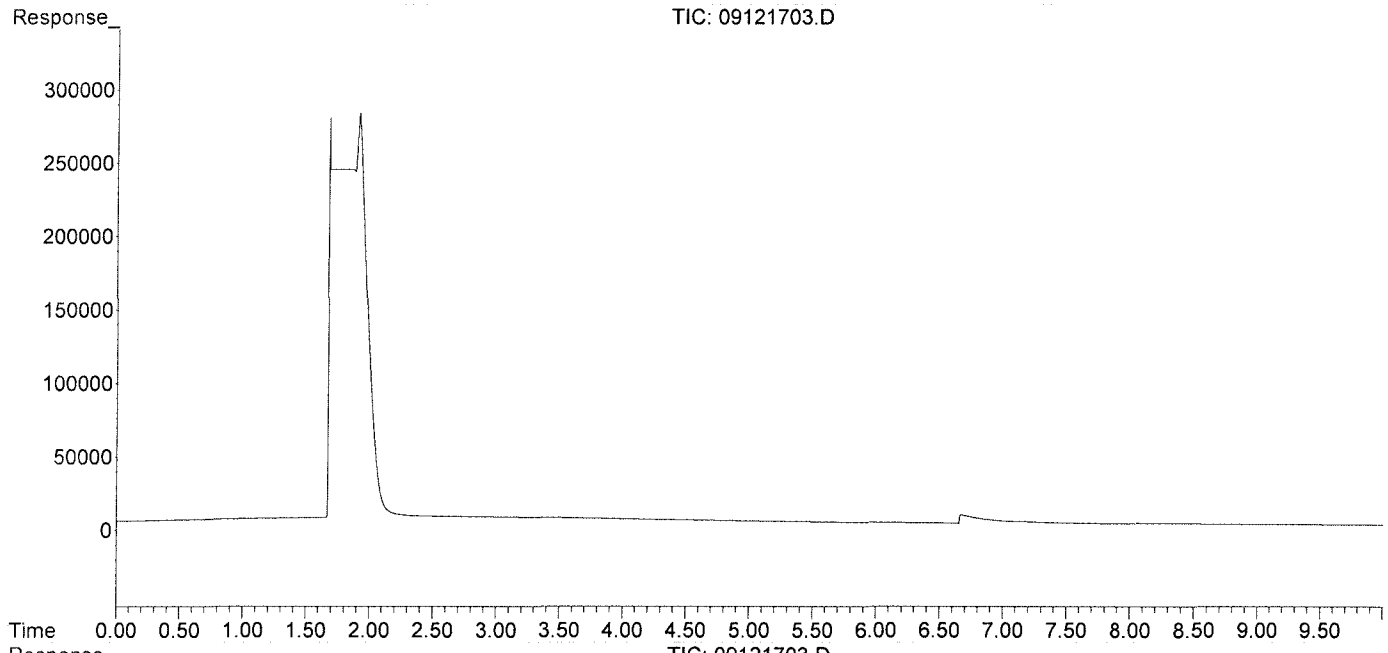
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.913f	-25181981	N.D.	ppm	
2)	Carbon monoxide	1.913f	-25181981	1.089	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.049	3564	0.391	ppm	m
7)	Ethylene	1.577	4947	0.292	ppm	
8)	Ethane	1.828	5060	0.293	ppm	
9)	Propylene	4.207	6933	0.281	ppm	
10)	Propane	4.337	6894	0.268	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.579f	9587	0.158	ppm	
13)	n-Butane	6.579f	9587	0.158	ppm	

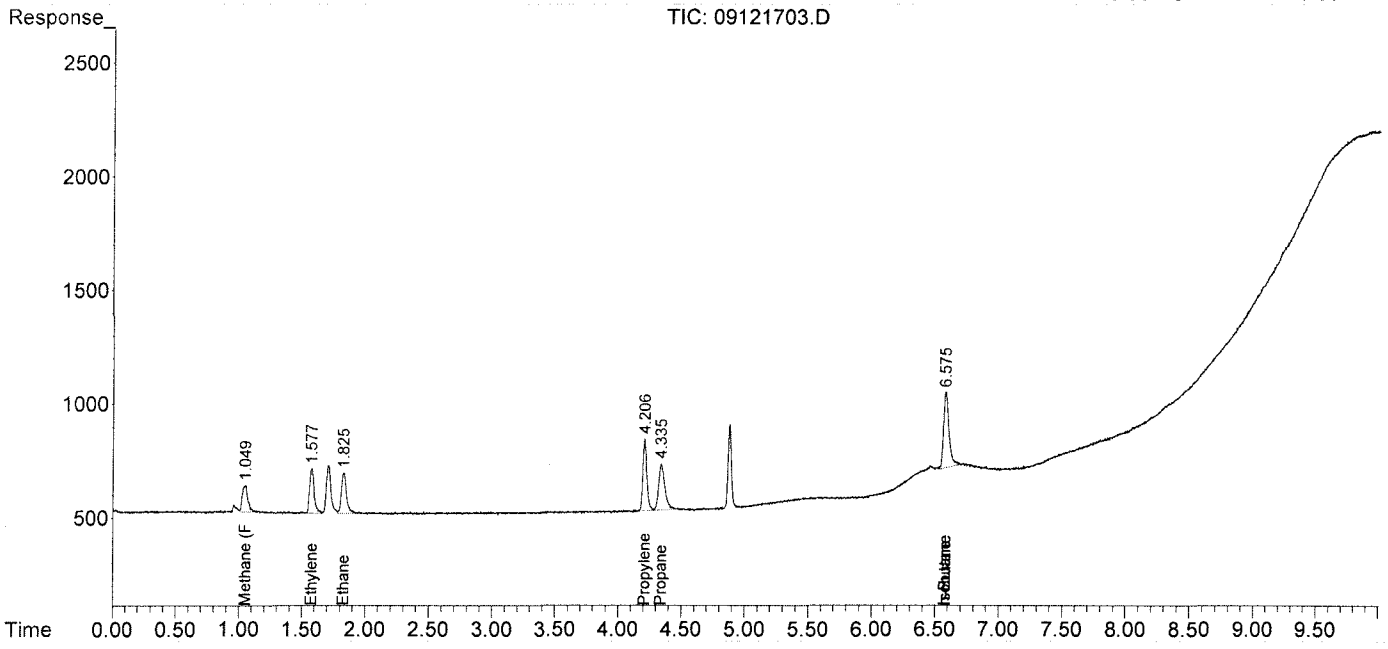
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

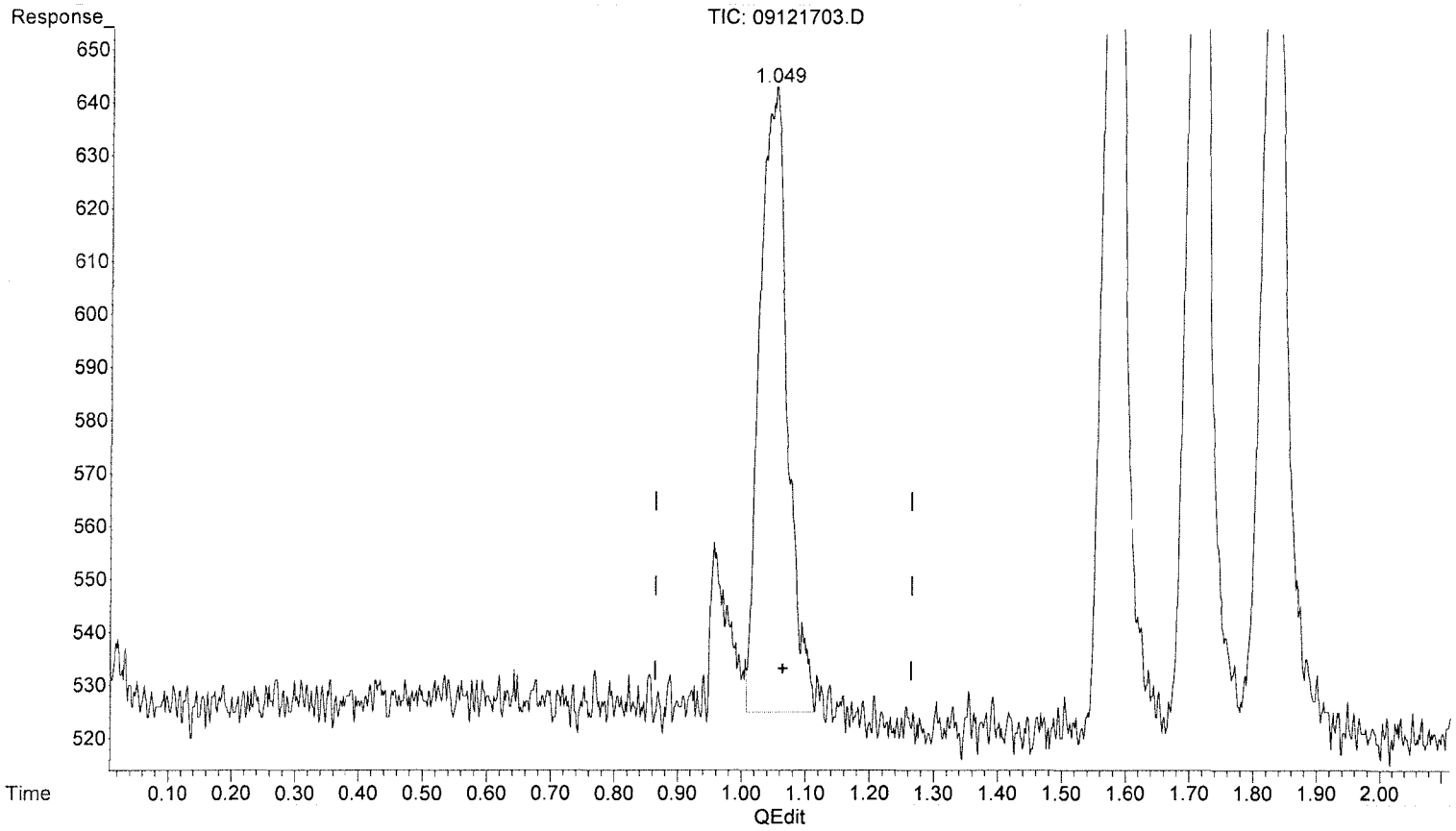




Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)

1.049min 0.391 ppm m

response 3564

(+) = Expected Retention Time

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121704.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:45
Operator : MC
Sample : 1.51ppm 0.1ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:55 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

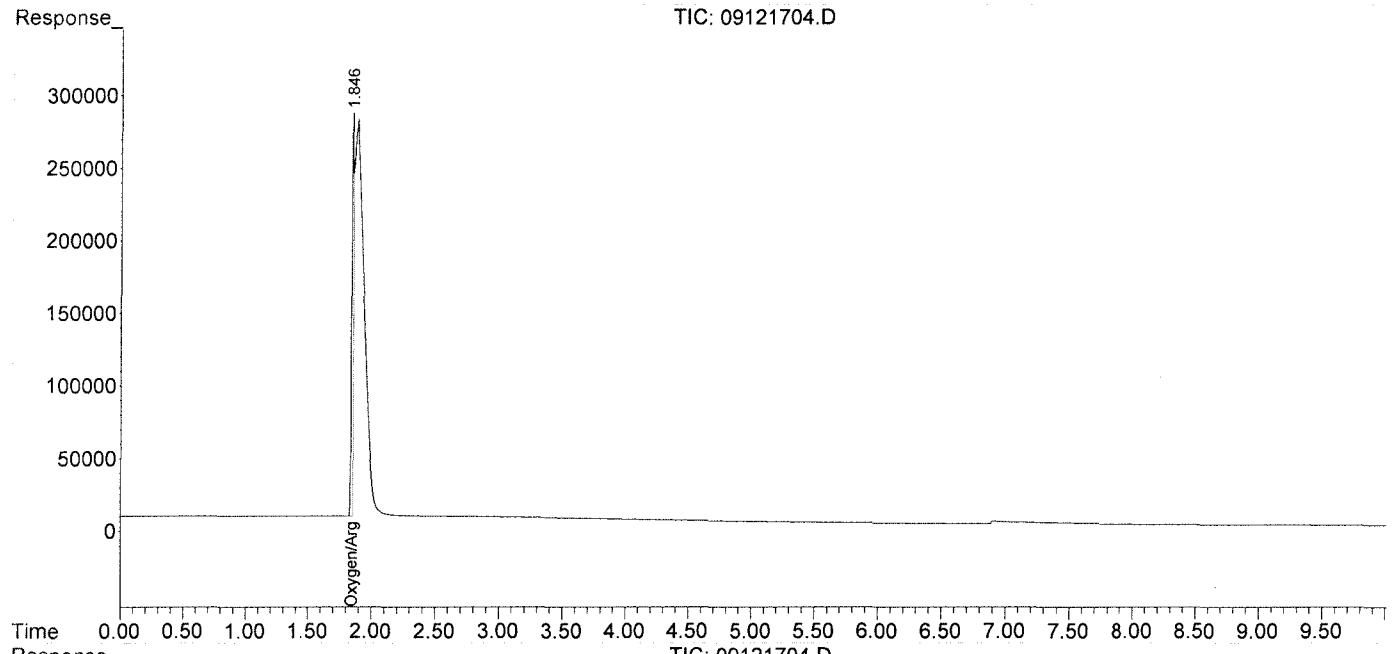
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.847	2536230	1.056	ppm
2)	Carbon monoxide	1.847	2536230	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.064	14725	1.613	ppm
7)	Ethylene	1.598	26885	1.582	ppm
8)	Ethane	1.851	26944	1.555	ppm
9)	Propylene	4.220	39140	1.589	ppm
10)	Propane	4.349	39934	1.596	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.578f	55348	1.020	ppm
13)	n-Butane	6.578f	55348	1.020	ppm

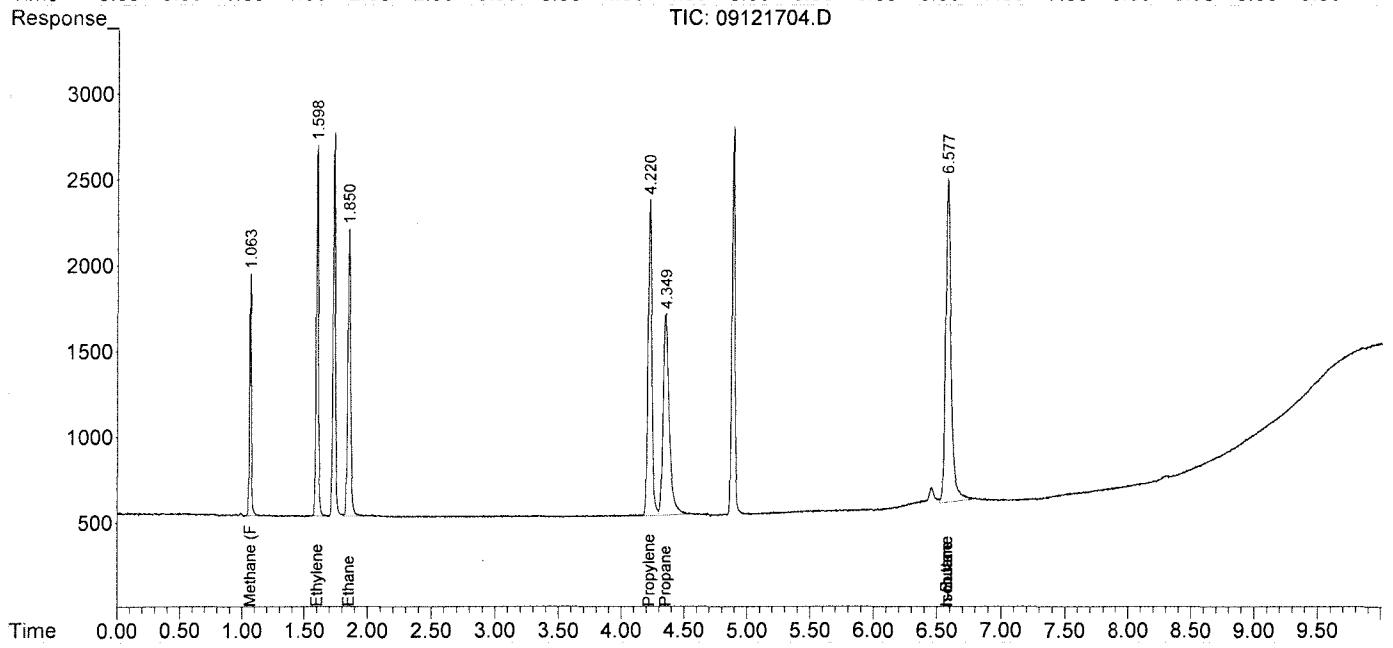
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121704.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:45
Operator : MC
Sample : 1.51ppm 0.1ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:55 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121705.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:09
Operator : MC
Sample : 4.53ppm 0.3ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:06:32 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

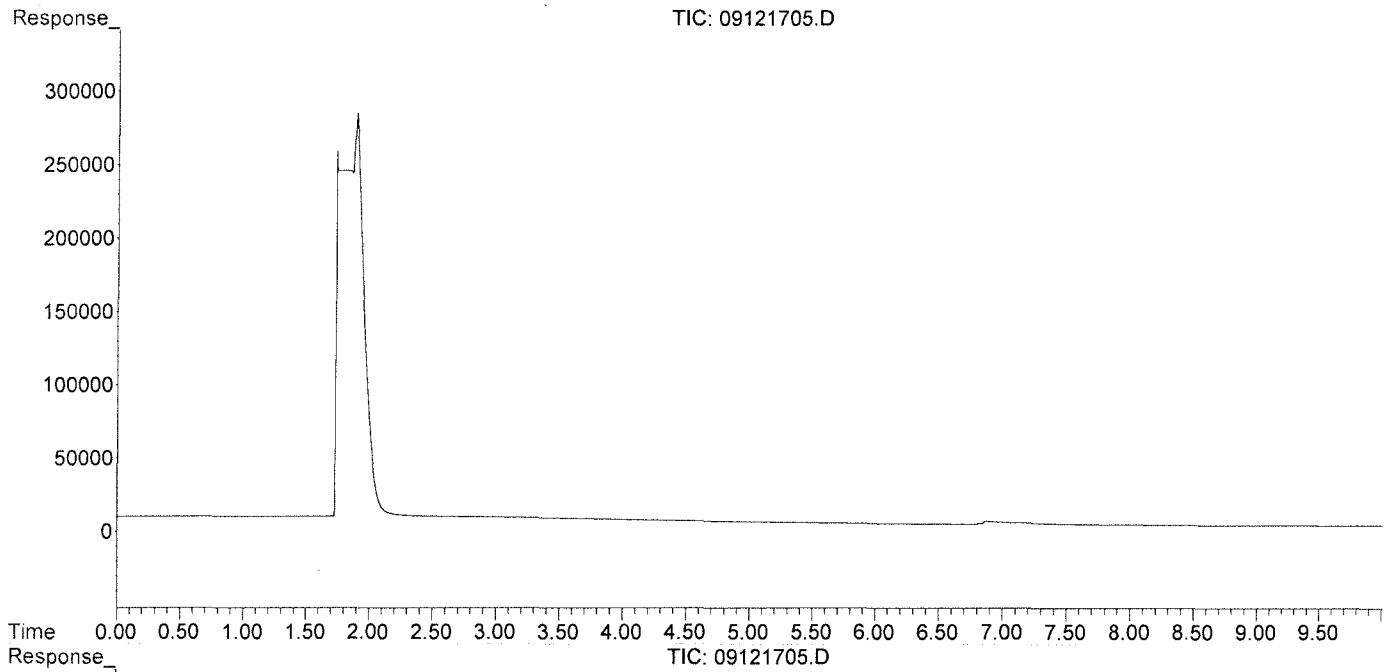
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.738	-331216	N.D.	ppm
2)	Carbon monoxide	1.738	-331216	0.019	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.052	41129	4.522	ppm
7)	Ethylene	1.586	77903	4.637	ppm
8)	Ethane	1.838	78354	4.558	ppm
9)	Propylene	4.218	112342	4.614	ppm
10)	Propane	4.347	115723	4.680	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.580f	155256	3.565	ppm
13)	n-Butane	6.580f	155256	3.565	ppm

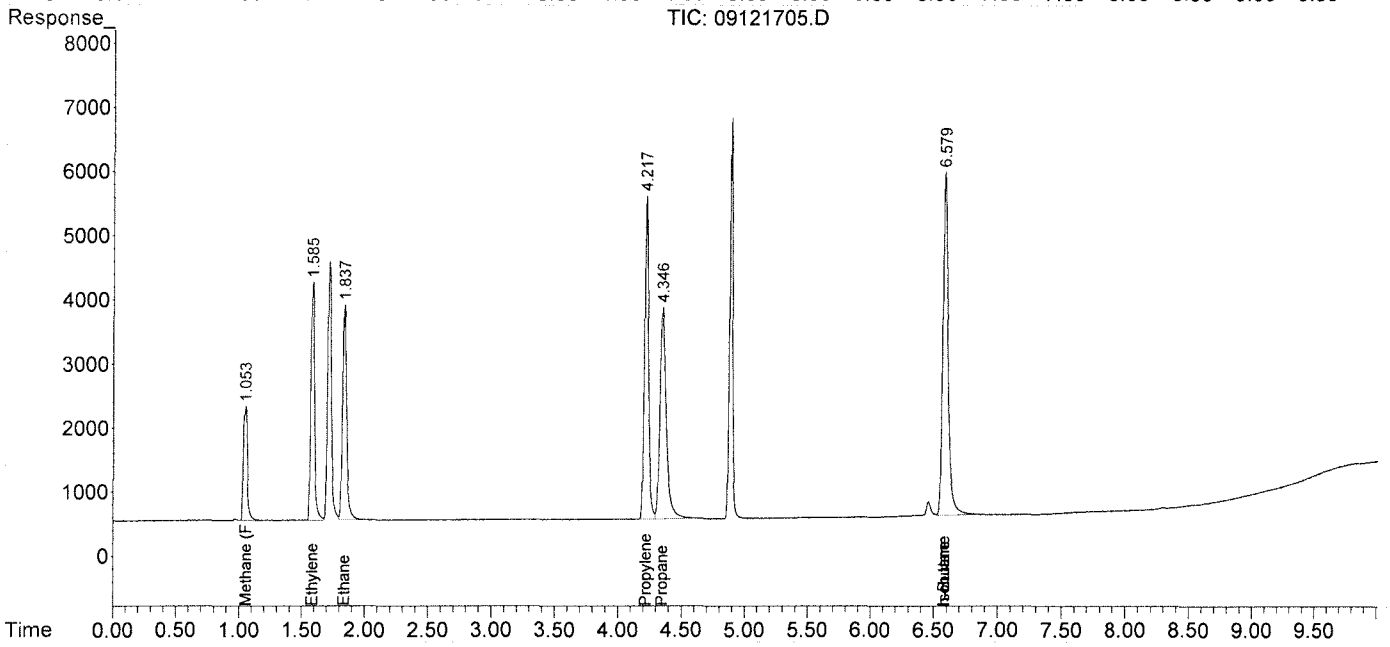
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121705.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:09
Operator : MC
Sample : 4.53ppm 0.3ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:06:32 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121706.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:30
Operator : MC
Sample : 10.57ppm 0.7ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:24 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

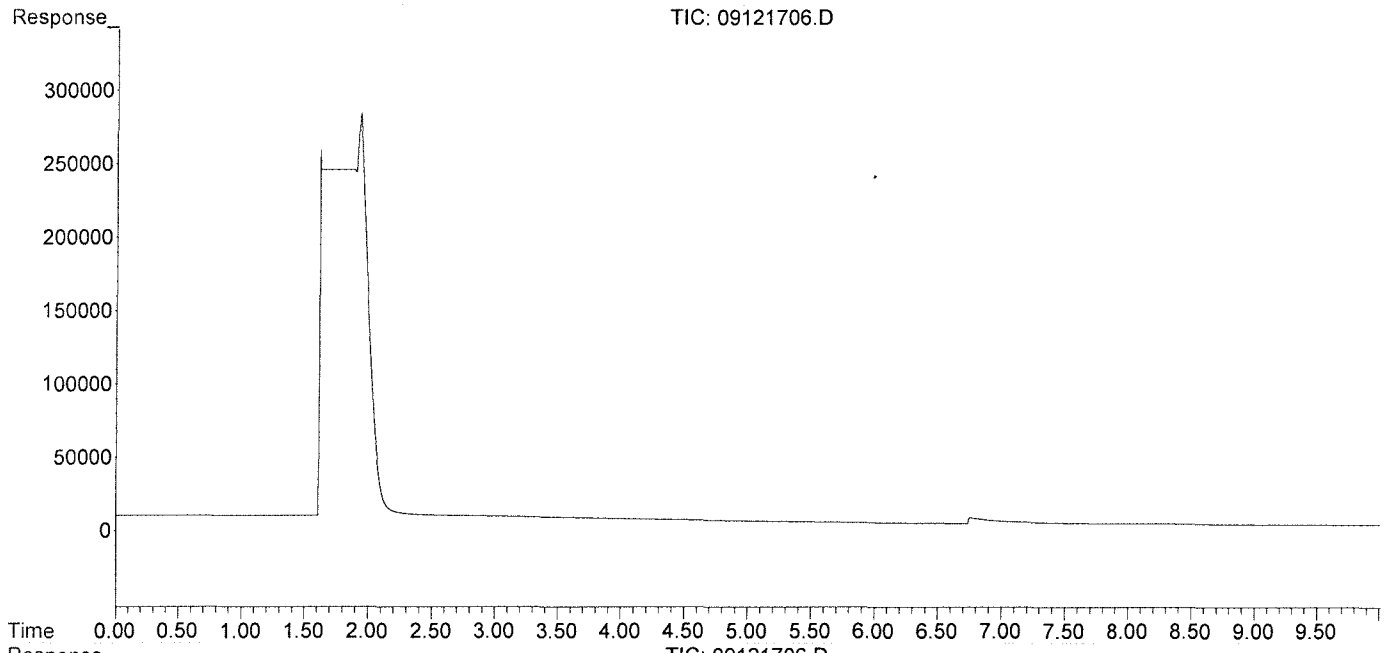
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.929f	-31871242	N.D.	ppm
2)	Carbon monoxide	1.929f	-31871242	1.818	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.025	91967	10.135	ppm
7)	Ethylene	1.568	172086	10.273	ppm
8)	Ethane	1.822	178841	10.441	ppm
9)	Propylene	4.214	248004	10.236	ppm
10)	Propane	4.344	257124	10.458	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.578f	338181	9.254	ppm
13)	n-Butane	6.578f	338181	9.254	ppm

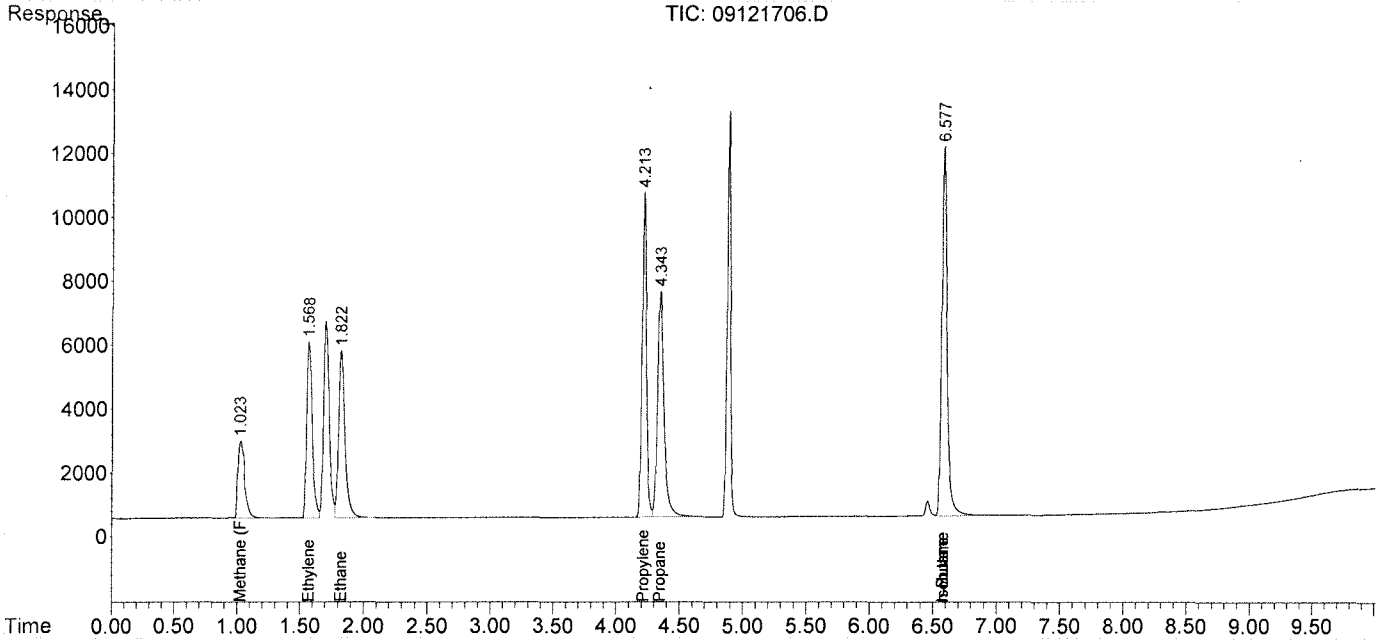
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121706.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:30
Operator : MC
Sample : 10.57ppm 0.7ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:24 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121707.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:47
Operator : MC
Sample : 200ppm 0.1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:59 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

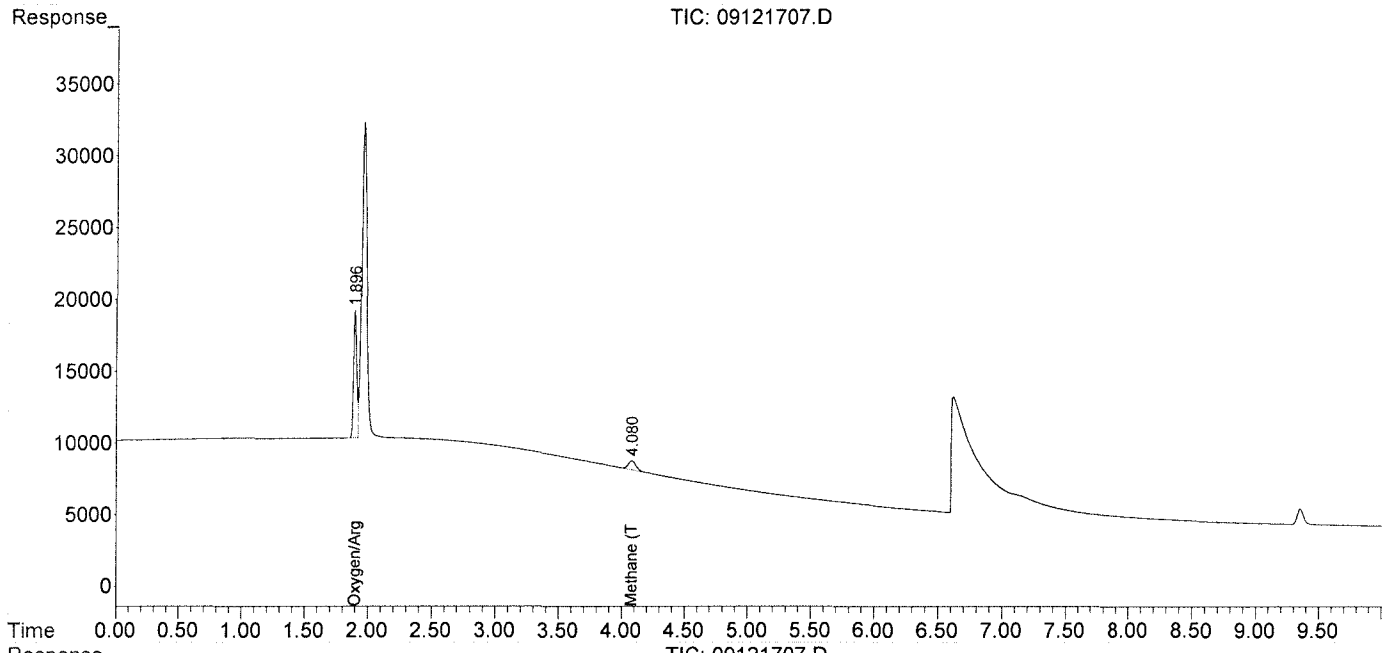
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.897	155286	0.065	ppm
2)	Carbon monoxide	1.897	155286	N.D.	ppm
3)	Methane (TCD)	4.079f	27015	2856.472	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.063	1735997	190.792	ppm
7)	Ethylene	1.597	3339702	198.758	ppm
8)	Ethane	1.849	3350442	194.597	ppm
9)	Propylene	4.201	4504060	185.706	ppm
10)	Propane	4.333	5043036	204.809	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

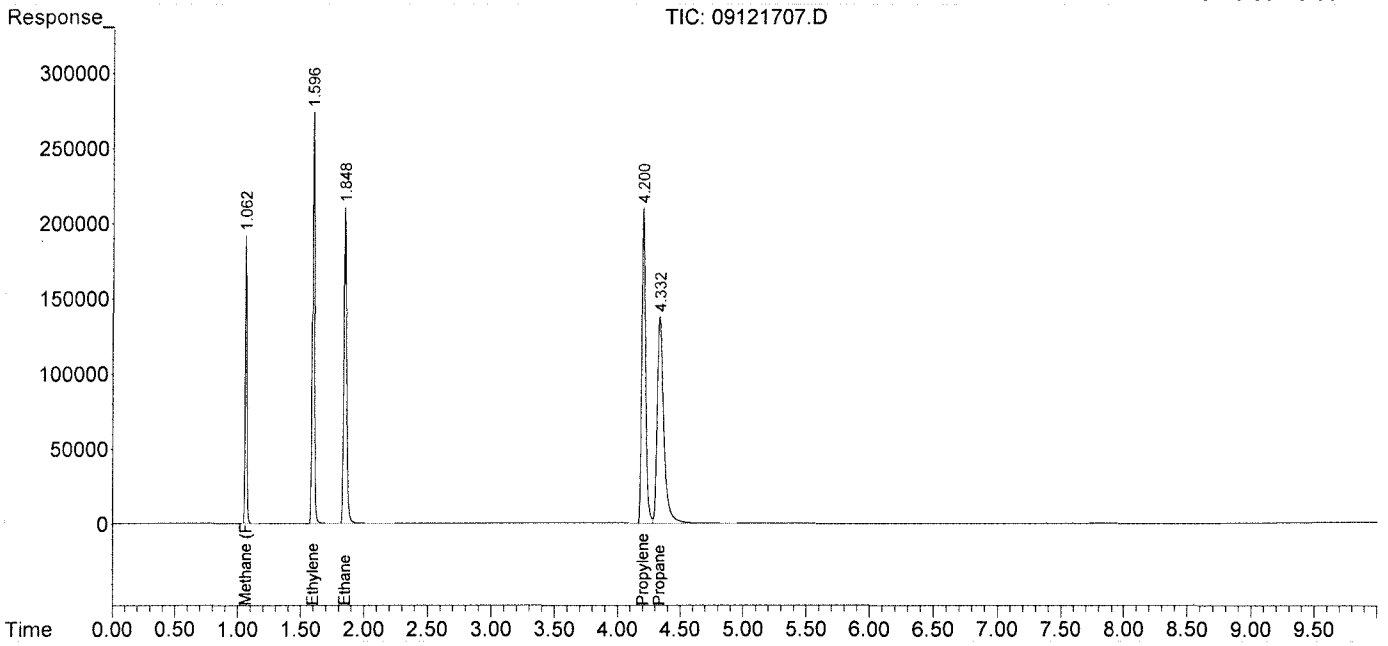
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121707.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:47
Operator : MC
Sample : 200ppm 0.1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:59 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121708.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:00
Operator : MC
Sample : 600ppm 0.3ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:10:57 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:10:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

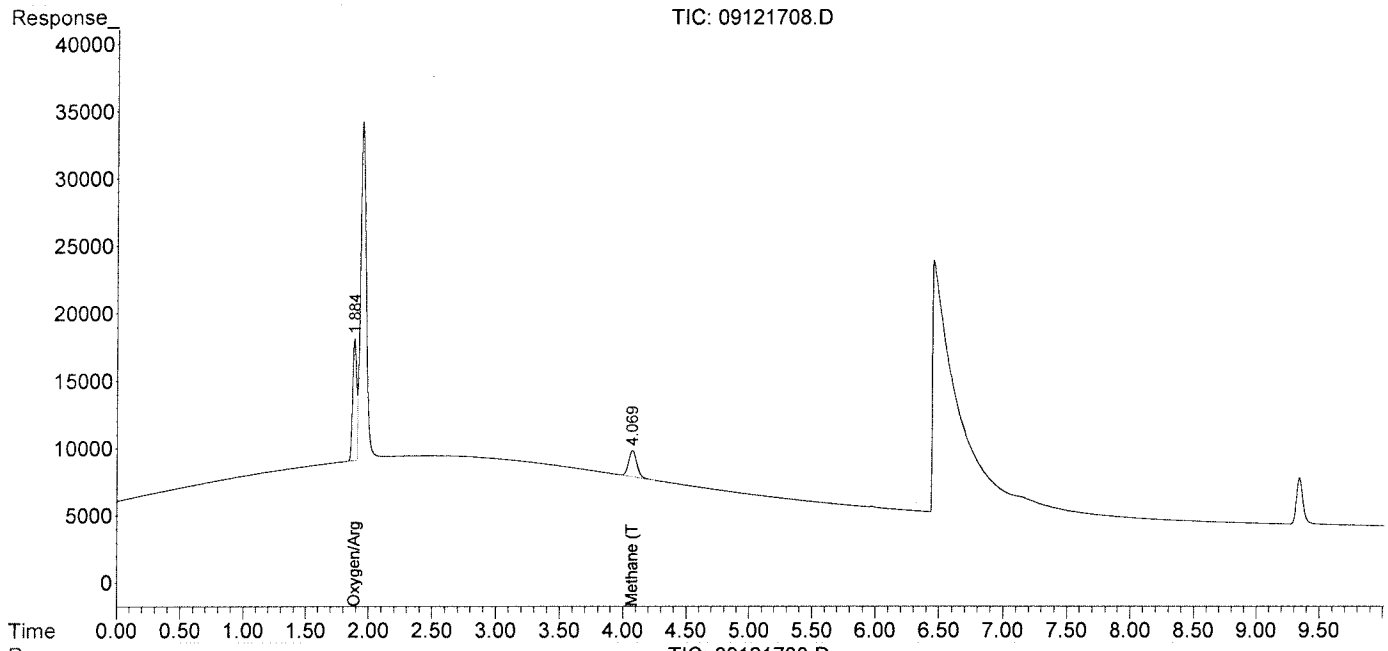
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.884	196022	0.124	ppm
2)	Carbon monoxide	1.884	196022	N.D.	ppm
3)	Methane (TCD)	4.070f	88282	782.730	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.044	5189849	539.759	ppm
7)	Ethylene	1.573	10007759	590.286	ppm
8)	Ethane	1.822	10048964	583.213	ppm
9)	Propylene	4.160	13569343	562.612	ppm
10)	Propane	4.300	15251326	615.171	ppm
11)	Isobutylene	6.143	9815	NoCal	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

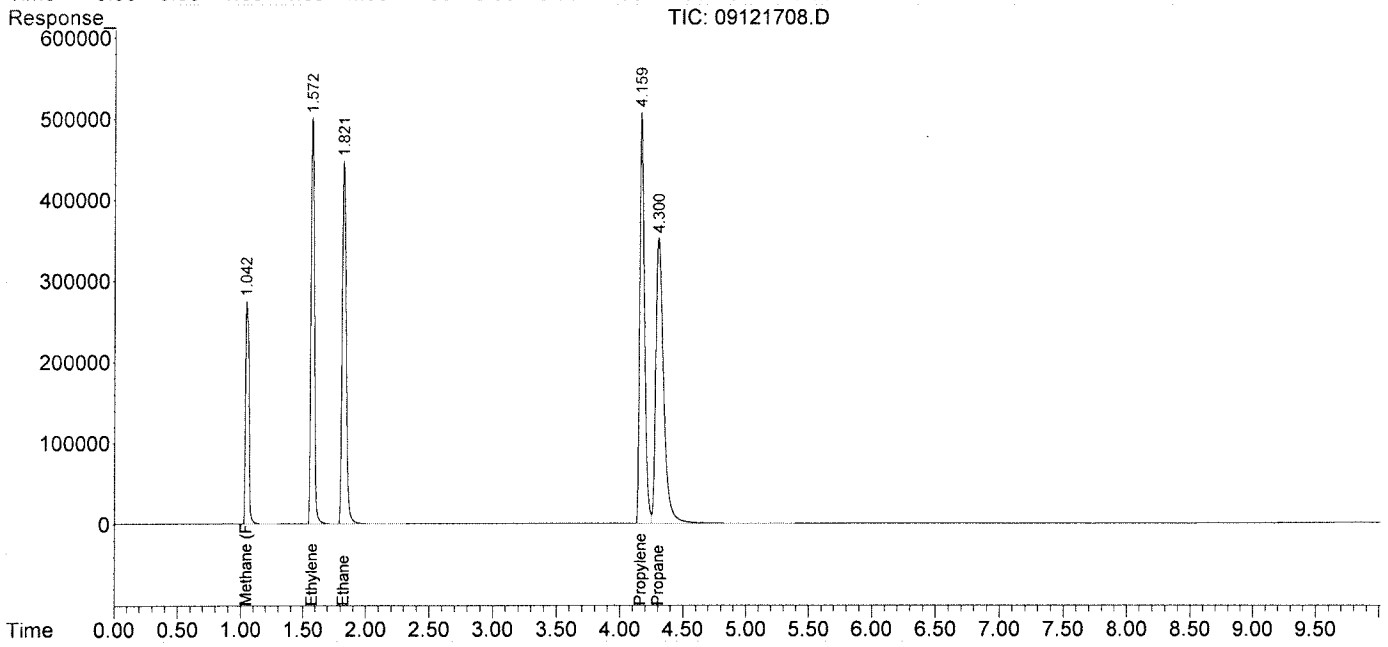
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121708.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:00
Operator : MC
Sample : 600ppm 0.3ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:10:57 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:10:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121709.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:47
Operator : MC
Sample : 1000ppm 0.5ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:11:46 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:11:38 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

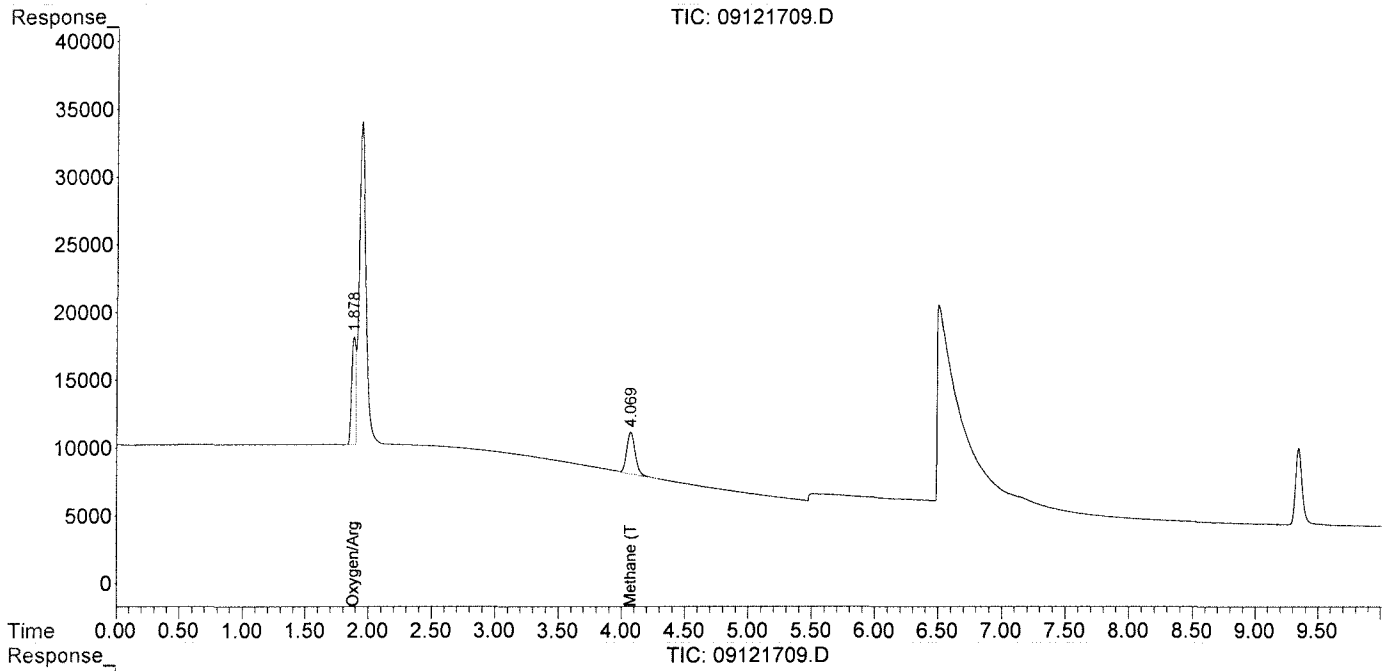
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.879	192611	0.162	ppm
2)	Carbon monoxide	1.879	192611	N.D.	ppm
3)	Methane (TCD)	4.070f	145492	1244.729	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.039	8598534	945.644	ppm
7)	Ethylene	1.576	16608504	981.887	ppm
8)	Ethane	1.827	16709165	973.644	ppm
9)	Propylene	4.161	22494888	941.060	ppm
10)	Propane	4.298	25459411	1023.223	ppm
11)	Isobutylene	6.138	16970	8645.243	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

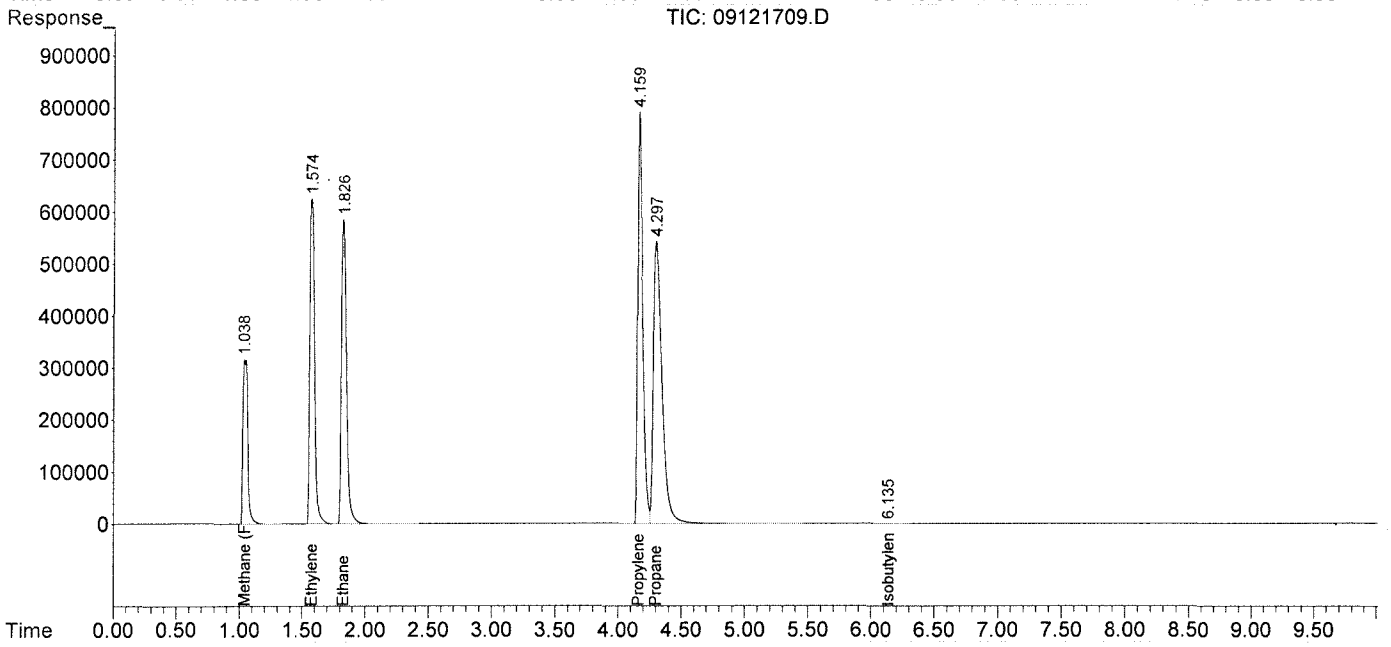
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121709.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:47
Operator : MC
Sample : 1000ppm 0.5ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:11:46 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:11:38 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121710.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:07
Operator : MC
Sample : 2000ppm 1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:12:33 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:12:25 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

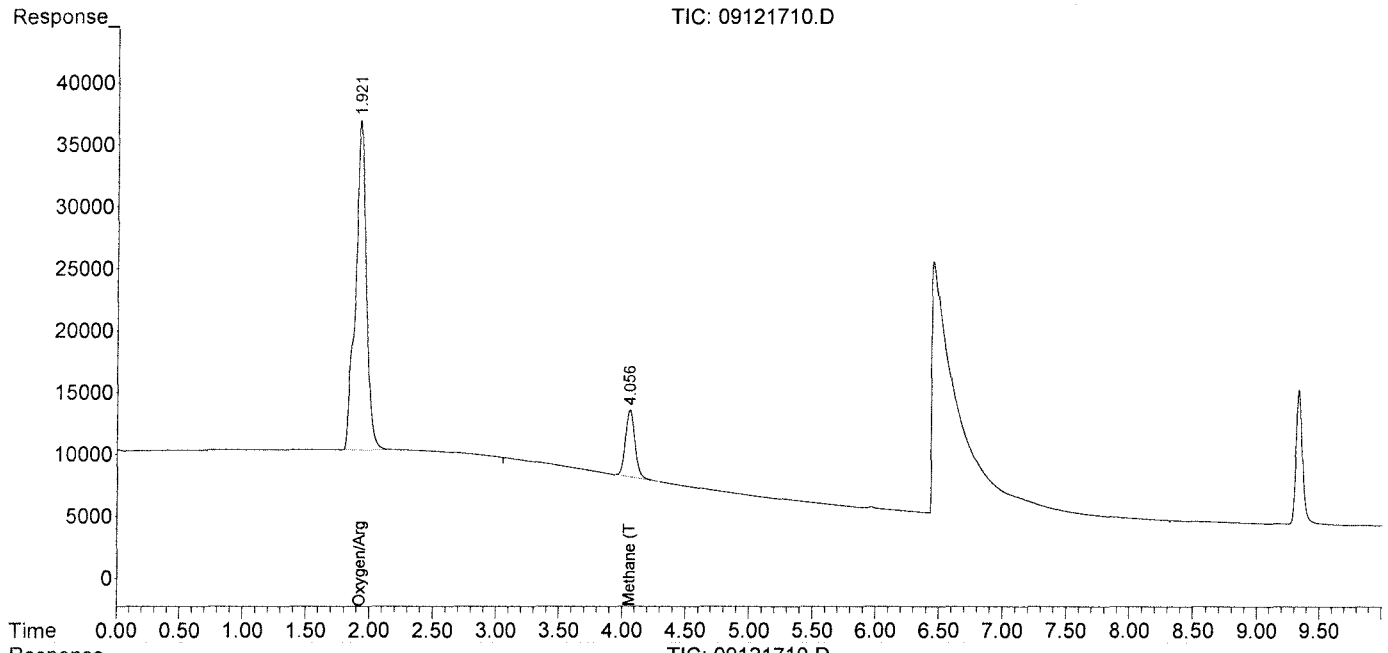
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.922f	1578147	1.659	ppm	
2)	Carbon monoxide	1.922f	1578147	N.D.	ppm	
3)	Methane (TCD)	4.057f	281651	3526.607	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.016	16098209	1763.622	ppm	
7)	Ethylene	1.552	31192444	1848.268	ppm	
8)	Ethane	1.801	31424218	1837.143	ppm	
9)	Propylene	4.129	42124690	1775.341	ppm	m
10)	Propane	4.269	48583085	1946.921	ppm	
11)	Isobutylene	6.136	33832	25613.603	ppm	
12)	Isobutane	6.576f	3845	0.120	ppm	
13)	n-Butane	6.576f	3845	0.120	ppm	

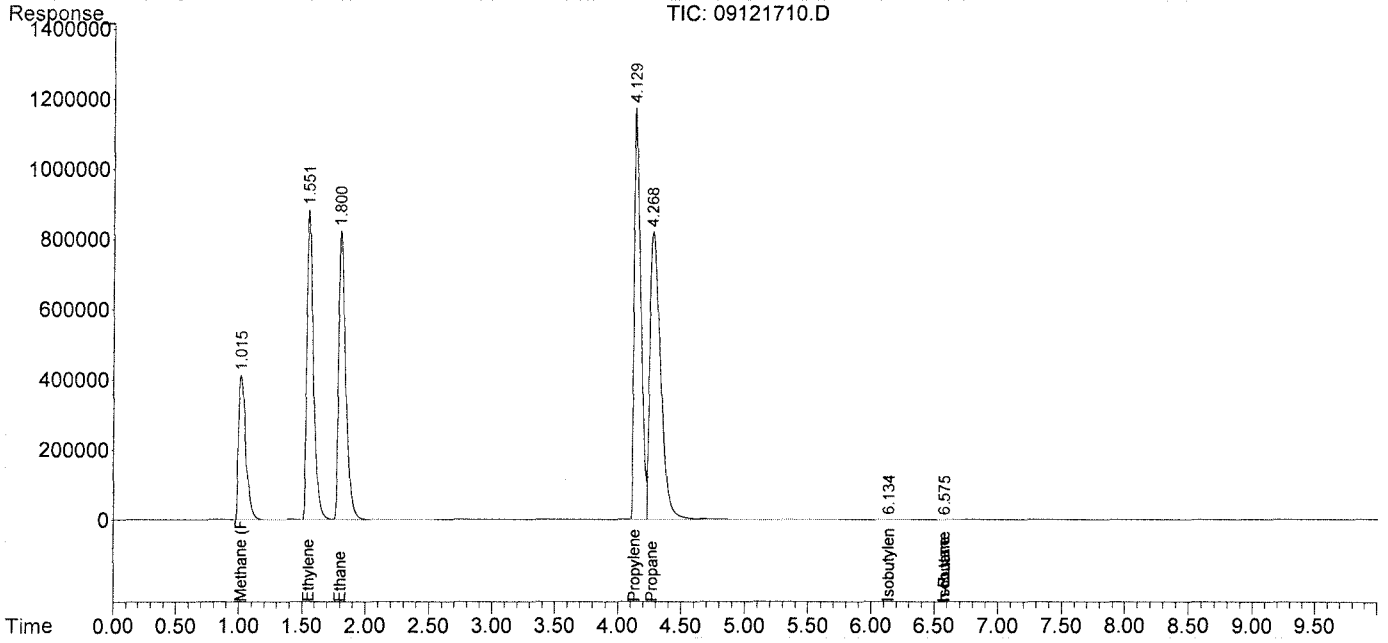
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121710.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:07
Operator : MC
Sample : 2000ppm 1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:12:33 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:12:25 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

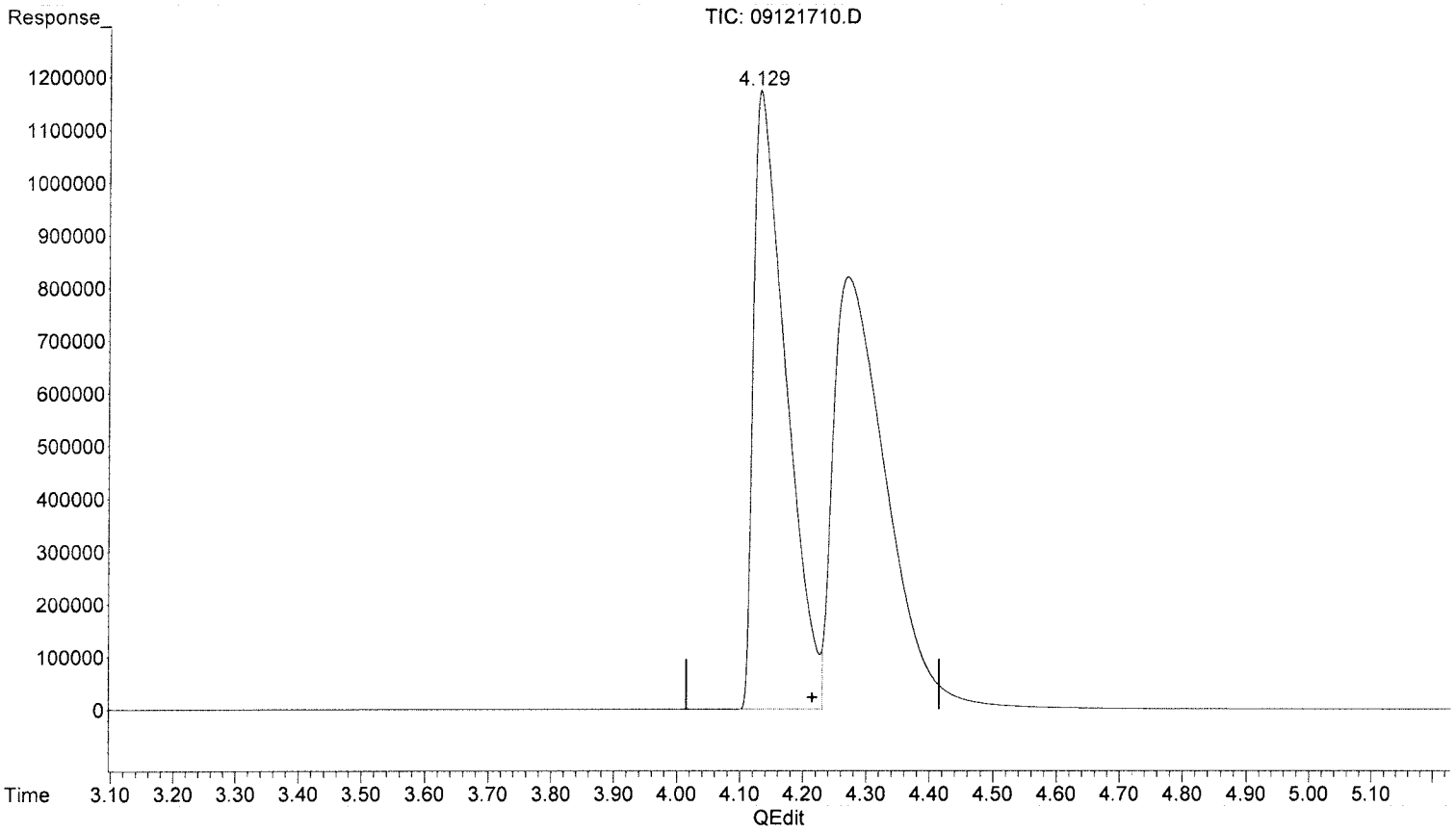




Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121710.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:07
Operator : MC
Sample : 2000ppm 1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:12:33 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:12:25 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(9) Propylene
4.129min 1775.341 ppm m
response 42124690

(+) = Expected Retention Time
RS091217_R.M Wed Sep 13 15:08:03 2017 Page: 1

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121711.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:48
Operator : MC
Sample : 4000ppm 0.1ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:13:37 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

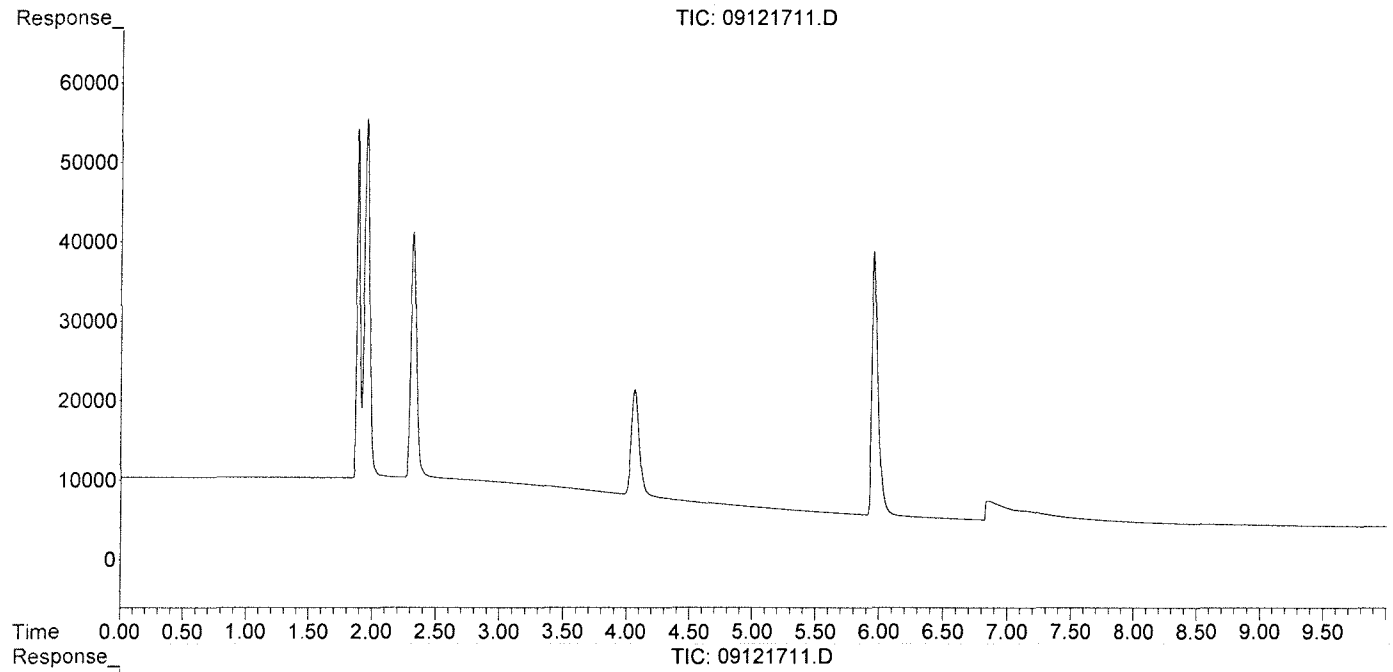
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	0.000	0	N.D.	ppm	d
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	0.000	0	N.D.	ppm	d
6)	Methane (FID)	1.059	35776839	3925.122	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

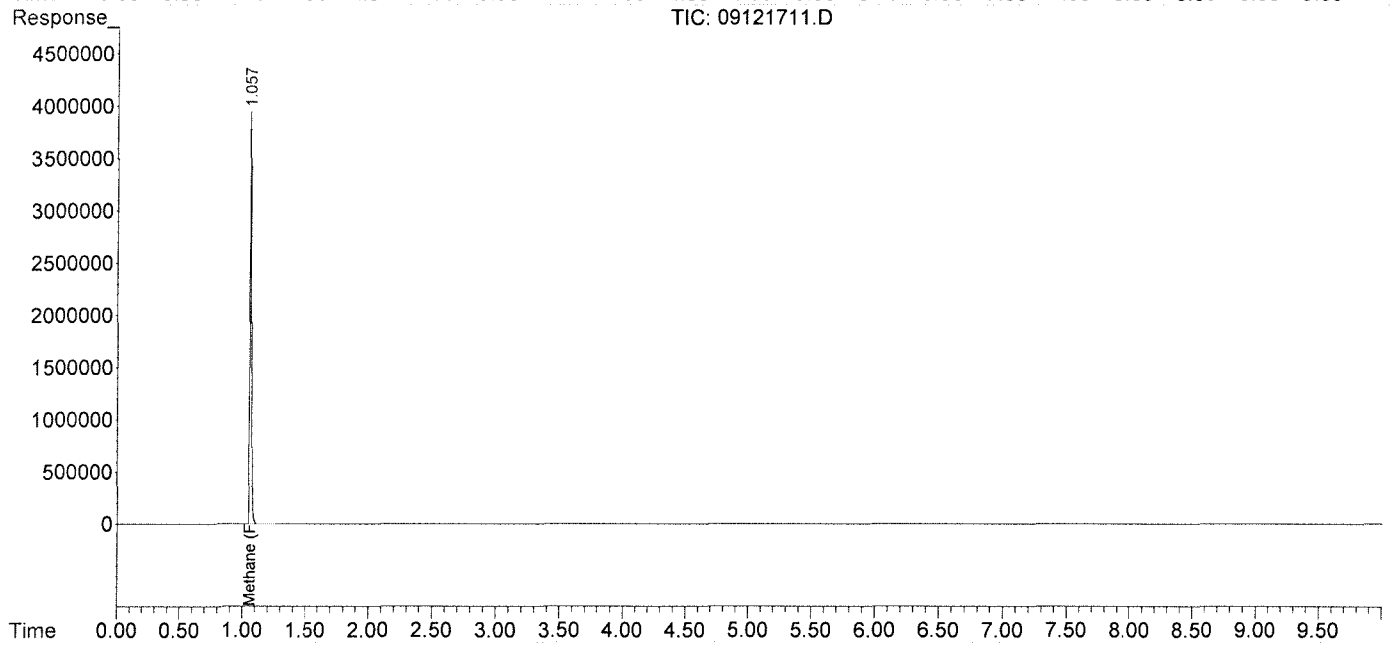
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121711.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:48
Operator : MC
Sample : 4000ppm 0.1ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:13:37 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121712.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 15:21
Operator : MC
Sample : 20000ppm 0.5ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:14:17 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

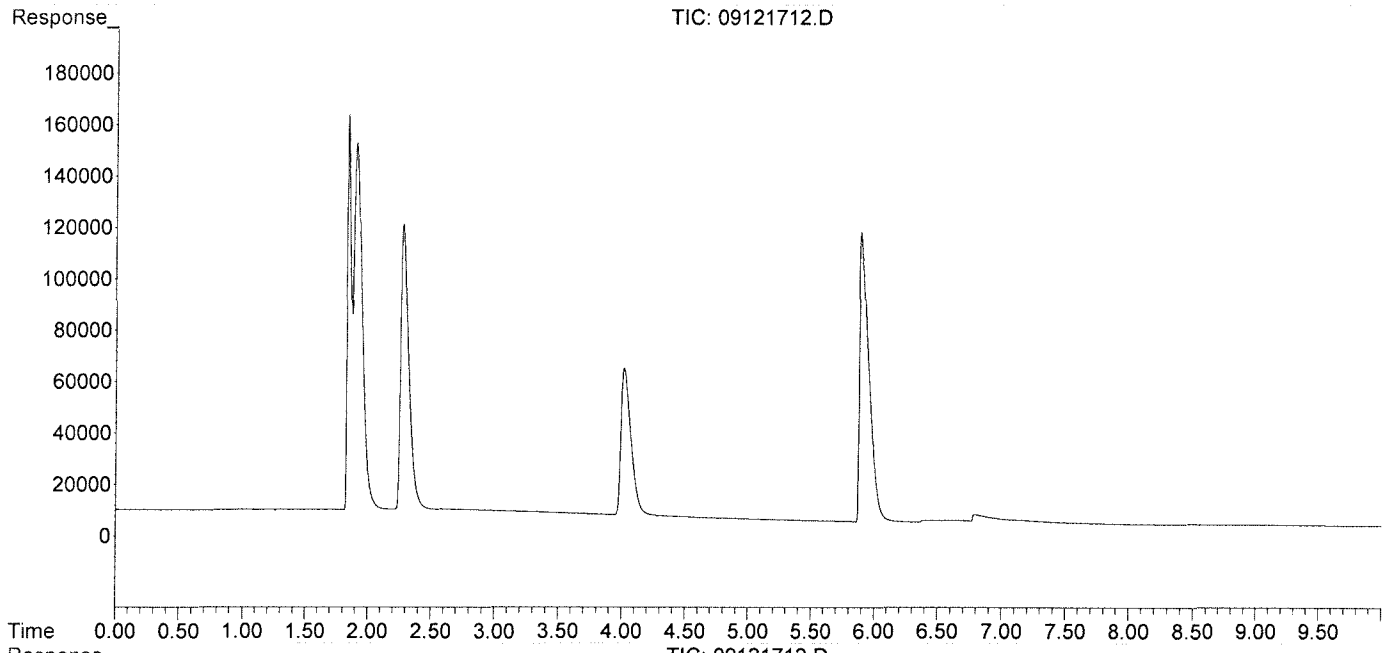
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.836	3190788	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	0.000	0	N.D.	ppm	d
6)	Methane (FID)	1.034	169009160	18492.064	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

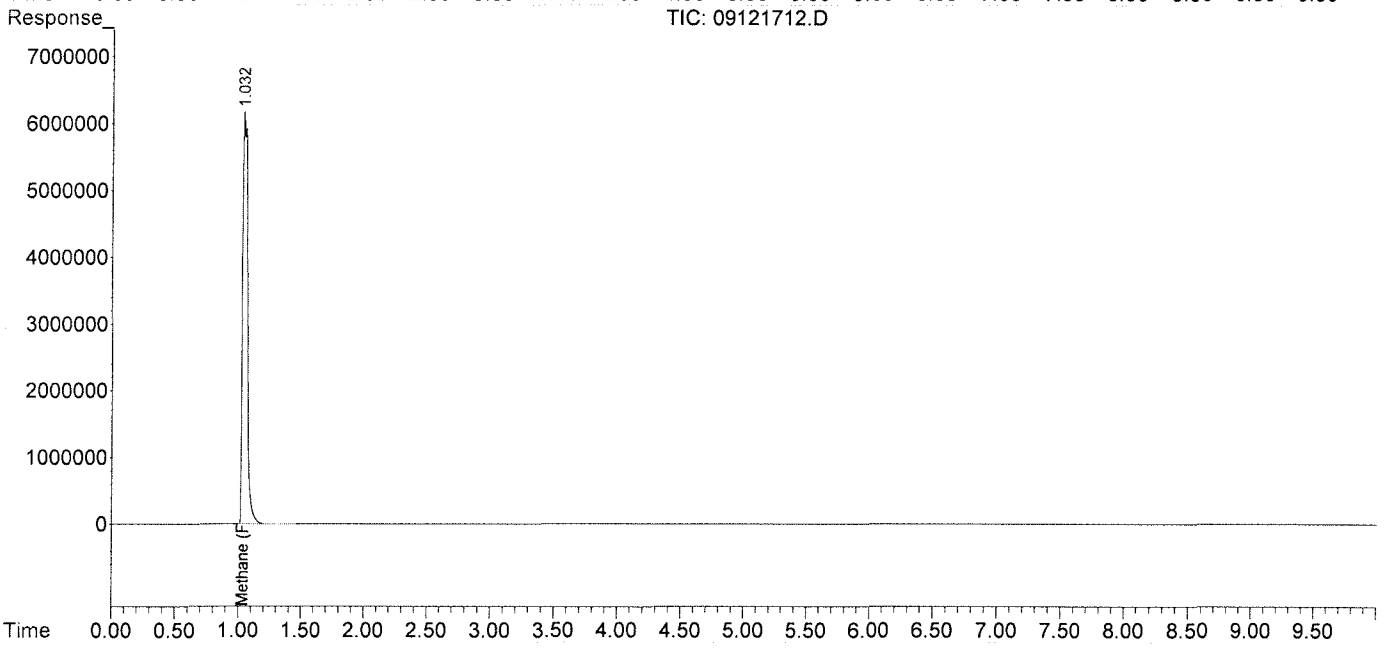
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121712.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 15:21
Operator : MC
Sample : 20000ppm 0.5ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:14:17 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 16:15
Operator : MC
Sample : icv s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:15:11 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.843	2922459	3.687	ppm	
2)	Carbon monoxide	1.843	2922459	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.063	13748	1.516	ppm	1.50 101.1
7)	Ethylene	1.598	24153	1.443	ppm	1.50 96.2
8)	Ethane	1.850	24488	1.445	ppm	1.50 96.3
9)	Propylene	4.221	36004	1.537	ppm	1.50 102.5
10)	Propane	4.350	37738	1.517	ppm	1.51 100.5
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.579f	48019	1.804	ppm	
13)	n-Butane	6.579f	48019	1.804	ppm	

actual %D

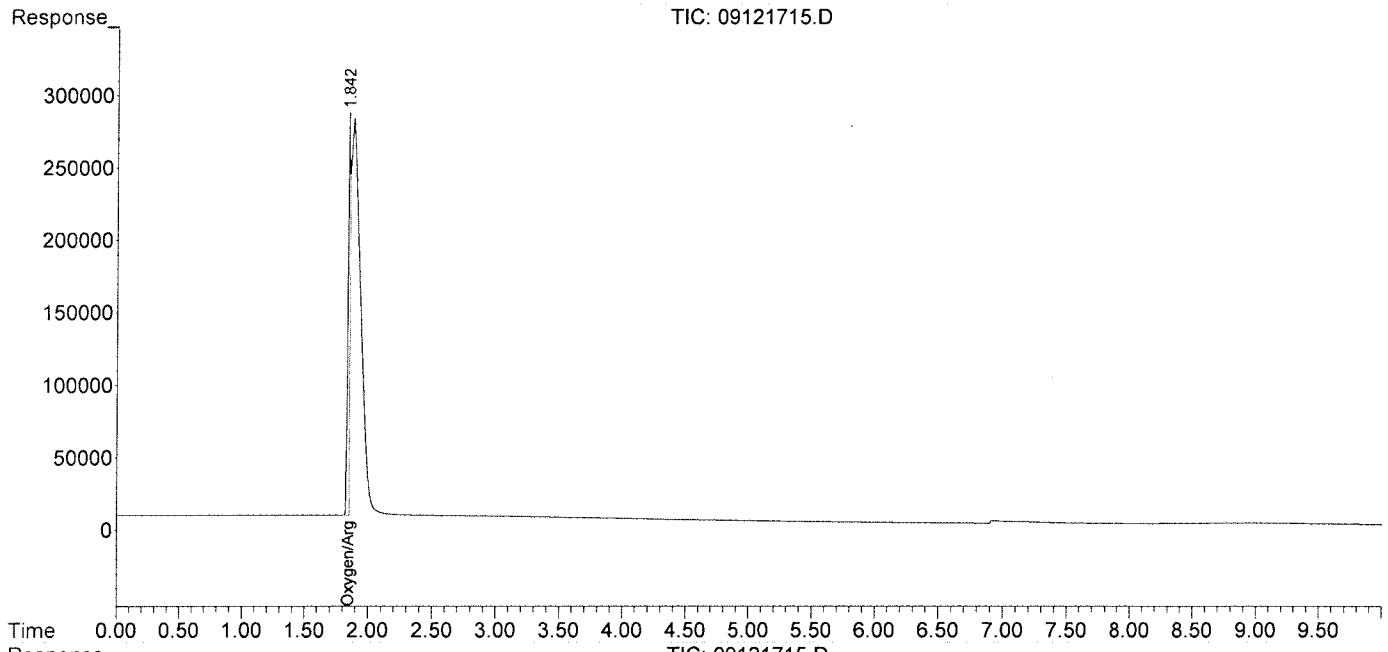
(f)=RT Delta > 1/2 Window (m)=manual int.

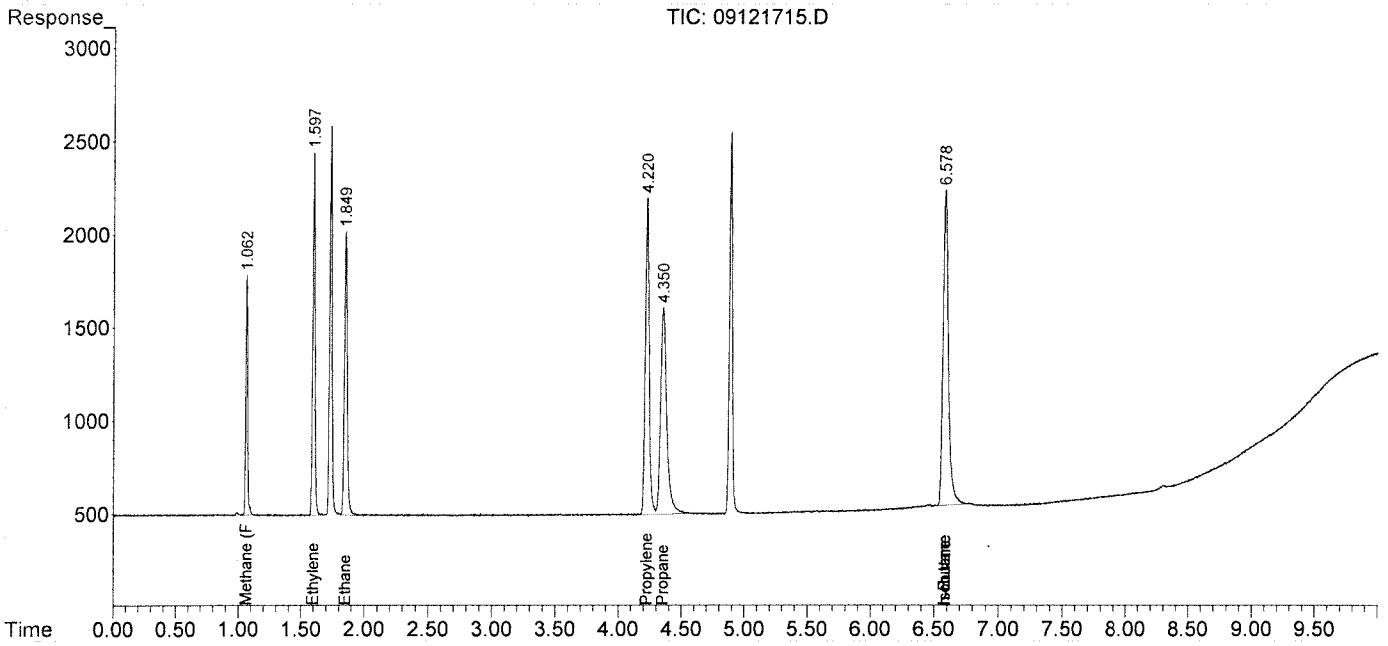
9/14/17

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 16:15
Operator : MC
Sample : icv s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:15:11 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Dissolved Gases by RSK175

ALS Environmental

Method : RSK175 Headspace Method for Dissolved Hydrocarbon in Water by FID/TCD
Client : ALS Laboratory Group
Service Request: P2005613
Sample Vol. (ml) : 32.00 ml
Analyst : WH
Date Analysis : 10/08/20
Head Space Vol.(ml) : 8.00 ml
Instrument : GC#10
Detector : FID#10, TCD#10
Gas Constant : 24.05684 (20°C)

FINAL RESULT (ug/L)

Sample ID	Methane		Ethylene	Ethane
RL	**1.30**		**1.00**	**0.60**
mcs 0.1ml	ND		ND	ND
rb 0.1ml	ND		ND	ND
fid lcs 0.1ml	2.806		5.419	5.004
fid lcsd 0.1ml	2.574		5.046	4.748
P2005613-001 0.1ml	2.172		0.000	0.000
P2005613-002 0.1ml	4.226		0.000	0.000
P2005613-003 0.1ml	4.586		0.142	0.000
P2005613-004 0.1ml	5.100		0.178	0.000
P2005613-005 0.1ml	3.847		0.000	0.000
P2005613-006 0.1ml	0.834	J	0.000	0.000

SPIKE RECOVERY SUMMARY (ug/L)

Sample ID	Methane	Ethylene	Ethane
mcs 0.1ml	ND	ND	ND
Amount Spiked	2.52	4.40	4.72
fid lcs	2.806	5.419	5.004
% Recovered	111.5%	123.1%	106.0%
fid lcsd	2.574	5.046	4.748
% Recovered	102.3%	114.6%	100.6%
% RPD	8.6%	7.1%	5.2%
Amount Spiked	169.19	294.12	316.86
P2005613-001ms 0.1ml	137.393	292.619	273.843
	79.9%	99.5%	86.4%
P2005613-001msd 0.1ml	137.366	289.728	273.324
	79.9%	98.5%	86.3%
	0.0%	1.0%	0.2%

P2005613-001ms 0.1ml	137.393	292.619	273.843	ND	ND	ND
P2005613-001msd 0.1ml	137.366	289.728	273.324	ND	ND	ND

Calculation :
1). Final Headspace Result (ppm) = ppm / Actual Injection Volume (mL)
2). Gas in Water (ug/L) : =[Final Headspace Result (mL) / 10^6 mL * 55.51 mole/L * MWt.(16.04 g/mole for CH4) * 1000 mg/g * 1000 ug/mg]/Henry's Constant
3). Gas in Head Space (ug/L) : = Final Headspace Result (mL) / 10^6 mL * mole/24.06 L (gas constant @20°C) * MWt.(16.04 g/mole for CH4) * 1000 mg/g * 1000 ug/g * L/1000mL * Headspace Volume (mL) / Sample Volume (mL) * 1000 mL/L
4.) Total final result : = 1) + 2)

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082001.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 11:09:32
Operator : WH
Sample : STD S32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 11:22:15 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

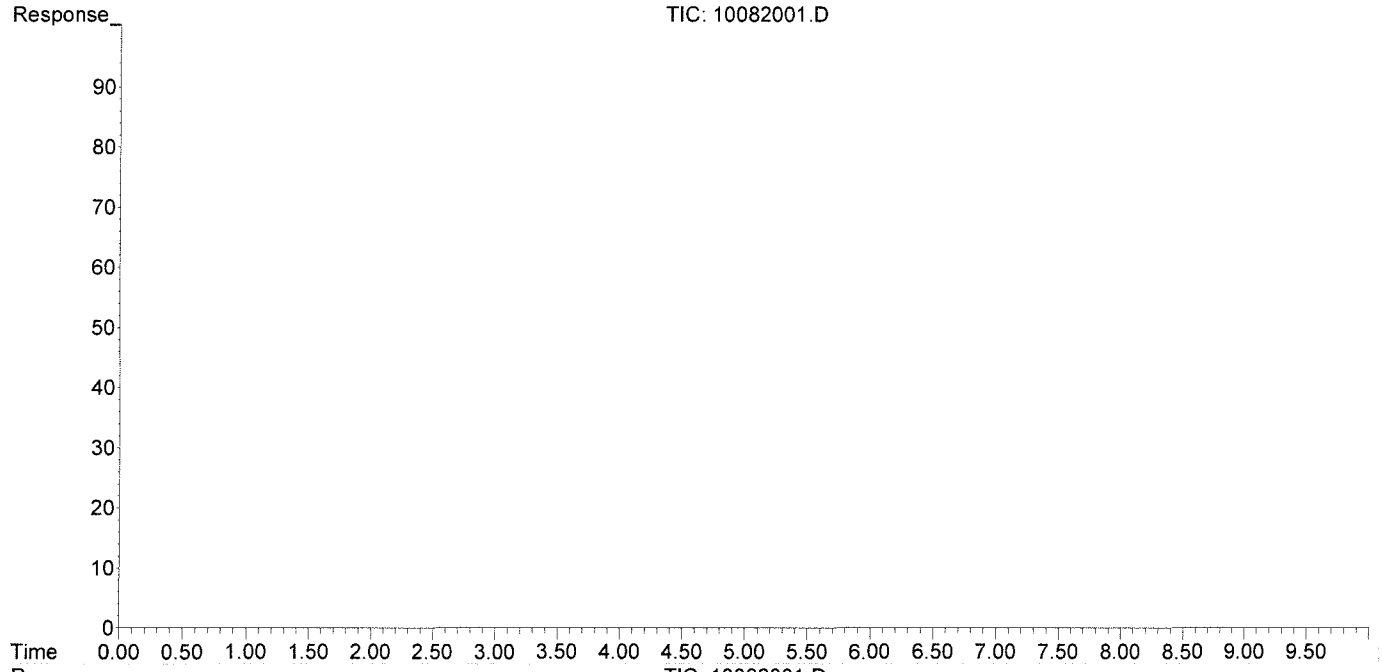
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.120	893552	98.510	ppm
7)	Ethylene	1.688	1748850	104.507	ppm
8)	Ethane	1.951	1753238	103.435	ppm
9)	Propylene	4.318	2558614	109.195	ppm
10)	Propane	4.439	2624489	105.485	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

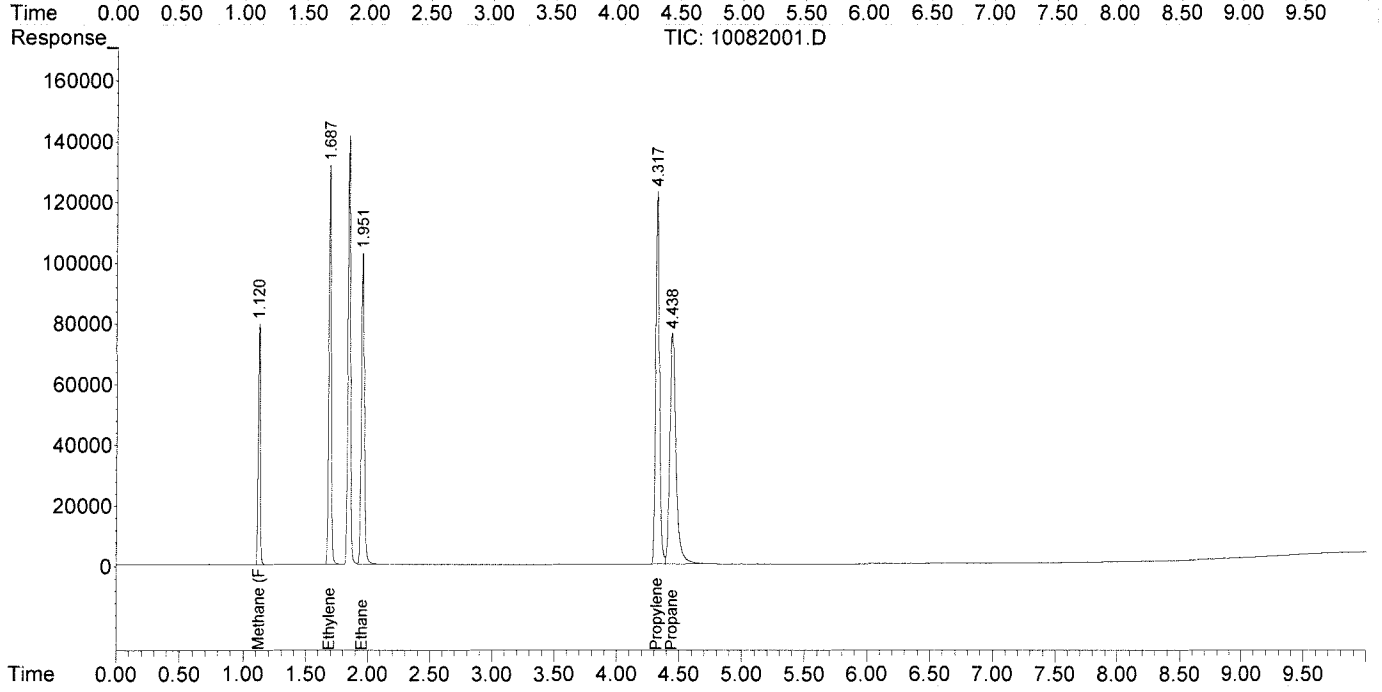
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082001.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 11:09:32
Operator : WH
Sample : STD S32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 11:22:15 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082014.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 15:19:17
Operator : WH
Sample : STD S32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 15:29:35 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

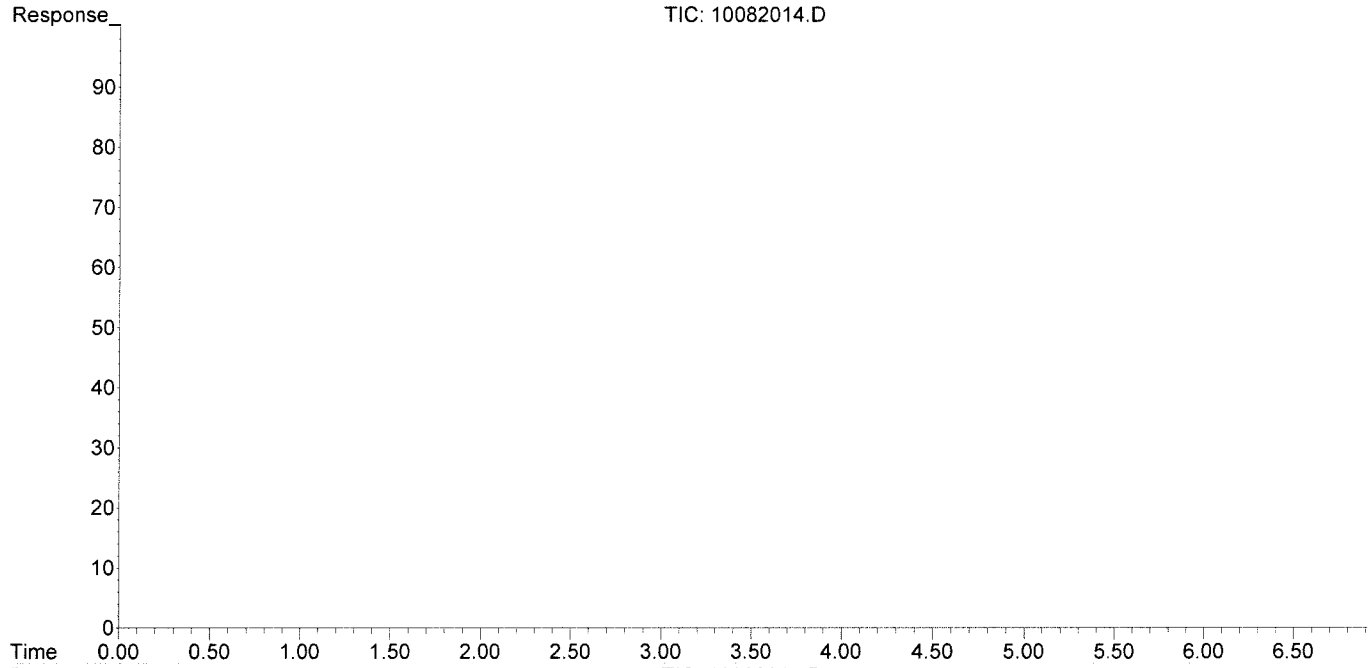
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.117	858400	94.635	ppm
7)	Ethylene	1.685	1675048	100.097	ppm
8)	Ethane	1.948	1683302	99.309	ppm
9)	Propylene	4.315	2446293	104.402	ppm
10)	Propane	4.436	2513672	101.031	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

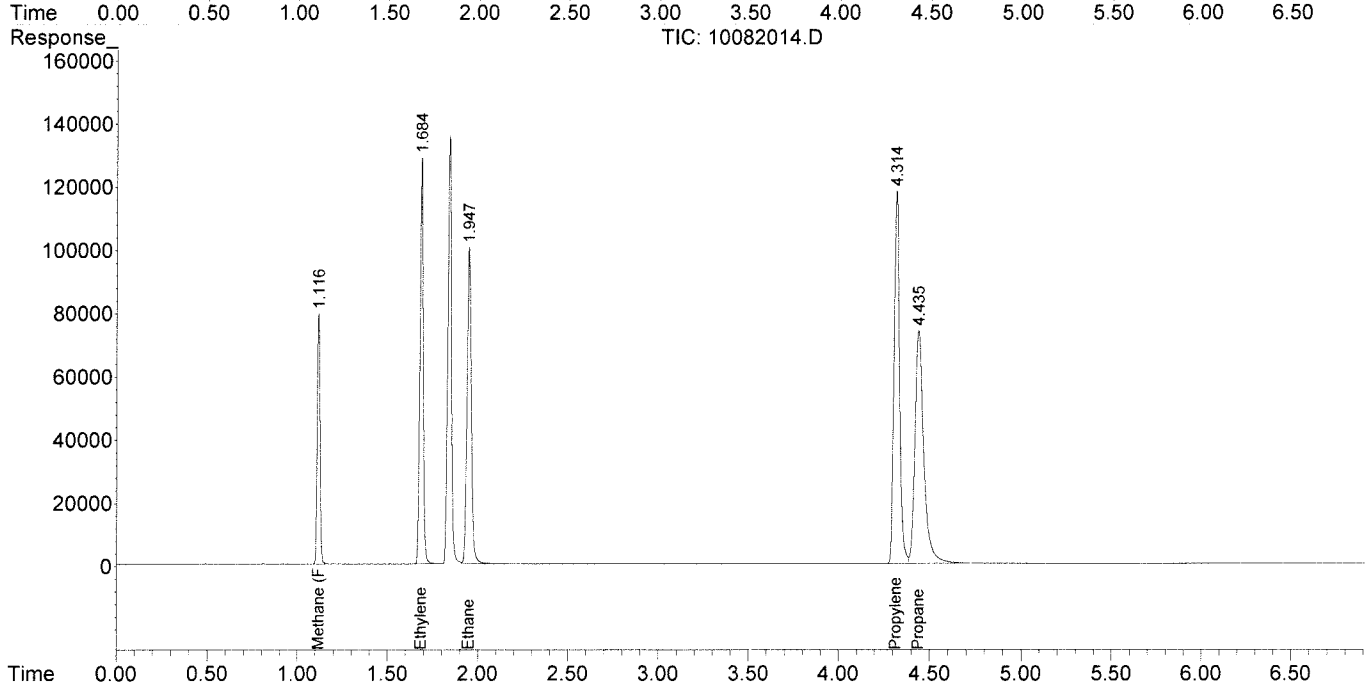
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082014.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 15:19:17
Operator : WH
Sample : STD S32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 15:29:35 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Injection Log

Directory: I:\GC10\DATA\RSK_FID\2017_09\12\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	12-Sep-17, 08:38:08	09121701.D	test		MC	RSKBOTH.M	
2	12-Sep-17, 10:52:40	09121702.D	0.151ppm 0.250ml s32-09121702		MC	RSKBOTH.M	Curve
3	12-Sep-17, 11:05:49	09121703.D	0.302ppm 0.5ml s32-09121702		MC	RSKBOTH.M	Curve
4	12-Sep-17, 11:45:34	09121704.D	1.51ppm 0.1ml s32-09051701		MC	RSKBOTH.M	Curve
5	12-Sep-17, 12:09:33	09121705.D	4.53ppm 0.3ml s32-09051701		MC	RSKBOTH.M	Curve
6	12-Sep-17, 12:30:23	09121706.D	10.57ppm 0.7ml s32-09051701		MC	RSKBOTH.M	Curve
7	12-Sep-17, 12:47:18	09121707.D	200ppm 0.1ml s32-09121701		MC	RSKBOTH.M	Curve
8	12-Sep-17, 13:00:22	09121708.D	600ppm 0.3ml s32-09121701		MC	RSKBOTH.M	Curve
9	12-Sep-17, 13:47:48	09121709.D	1000ppm 0.5ml s32-09121701		MC	RSKBOTH.M	Curve
10	12-Sep-17, 14:07:58	09121710.D	2000ppm 1ml s32-09121701		MC	RSKBOTH.M	Curve
11	12-Sep-17, 14:48:48	09121711.D	4000ppm 0.1ml s32-08231701		MC	RSKBOTH.M	Curve
12	12-Sep-17, 15:21:51	09121712.D	20000ppm 0.5ml s32-08231701		MC	RSKBOTH.M	Curve
13	12-Sep-17, 15:38:59	09121713.D	mb 0.5ml		MC	RSKBOTH.M	Pass
14	12-Sep-17, 15:55:35	09121714.D	mb 0.1ml		MC	RSKBOTH.M	Pass
15	12-Sep-17, 16:15:26	09121715.D	icv s30-05241604		MC	RSKBOTH.M	Pass

Injection Log

Directory: I:\GC10\DATA\RSK_FID\2020_10\08\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	08-Oct-20, 11:09:32	10082001.D	STD S32-05221901		WH	RSKBOTH.M	pass
2	08-Oct-20, 11:47:08	10082002.D	rb 0.1ml		WH	RSKBOTH.M	pass
3	08-Oct-20, 12:03:51	10082003.D	mcs 0.1ml		WH	RSKBOTH.M	pass
4	08-Oct-20, 12:25:34	10082004.D	P2005613-002 0.1ml		WH	RSKBOTH.M	
5	08-Oct-20, 12:39:23	10082005.D	P2005613-003 0.1ml		WH	RSKBOTH.M	
6	08-Oct-20, 12:53:36	10082006.D	P2005613-004 0.1ml		WH	RSKBOTH.M	
7	08-Oct-20, 13:02:07	10082007.D	P2005613-005 0.1ml		WH	RSKBOTH.M	
8	08-Oct-20, 13:23:46	10082008.D	P2005613-006 0.1ml		WH	RSKBOTH.M	
9	08-Oct-20, 13:34:41	10082009.D	P2005613-001 0.1ml		WH	RSKBOTH.M	
10	08-Oct-20, 13:50:37	10082010.D	P2005613-001ms 0.1ml		WH	RSKBOTH.M	pass
11	08-Oct-20, 14:11:07	10082011.D	P2005613-001msd 0.1ml		WH	RSKBOTH.M	pass
12	08-Oct-20, 14:31:22	10082012.D	fid lcs 0.1ml		WH	RSKBOTH.M	pass
13	08-Oct-20, 15:03:59	10082013.D	fid lcsd 0.1ml		WH	RSKBOTH.M	pass
14	08-Oct-20, 15:19:17	10082014.D	STD S32-05221901		WH	RSKBOTH.M	pass
15	08-Oct-20, 15:30:40	10082015.D	P2005607-001 0.1		WH	RSKBOTH.M	
16	08-Oct-20, 15:45:29	10082016.D	P2005607-002 0.1		WH	RSKBOTH.M	
17	08-Oct-20, 15:58:00	10082017.D	P2005607-003 0.1		WH	RSKBOTH.M	
18	08-Oct-20, 16:20:20	10082018.D	P2005607-004 0.1		WH	RSKBOTH.M	
19	08-Oct-20, 16:49:47	10082019.D	P2005607-005 0.1		WH	RSKBOTH.M	
20	08-Oct-20, 17:11:07	10082020.D	STD S32-05221901		WH	RSKBOTH.M	pass

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

October 16, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS20100103**

Laboratory Results for: **LHAAP-50 OCTOBER 2020**

Dear Susan Huang,

ALS Environmental received 3 sample(s) on Oct 02, 2020 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: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 OCTOBER 2020
Work Order: HS20100103

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20100103-01	50WW29-201001	Groundwater		01-Oct-2020 12:30	02-Oct-2020 09:40	☐
HS20100103-02	50WW05-201001	Groundwater		01-Oct-2020 13:15	02-Oct-2020 09:40	☐
HS20100103-03	Trip Blank-201001	Water		01-Oct-2020 00:00	02-Oct-2020 09:40	☐

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 OCTOBER 2020
Work Order: HS20100103

CASE NARRATIVE

Work Order Comments

- The analysis for Perchlorate was subcontracted to our ALS Houston TX, High Resolution Lab. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R370141

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 OCTOBER 2020
Sample ID: 50WW29-201001
Collection Date: 01-Oct-2020 12:30

ANALYTICAL REPORT
WorkOrder:HS20100103
Lab ID:HS20100103-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Oct-2020 20:59
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Oct-2020 20:59
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Oct-2020 20:59
Tetrachloroethene	1.0	U	0.30	1.0	1.0	UG/L	1	08-Oct-2020 20:59
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Oct-2020 20:59
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	08-Oct-2020 20:59
Surr: 1,2-Dichloroethane-d4	*92.4*			**0**	*81-118*	*%REC*	*1*	*08-Oct-2020 20:59*
Surr: 4-Bromofluorobenzene	*109*			**0**	*85-114*	*%REC*	*1*	*08-Oct-2020 20:59*
Surr: Dibromofluoromethane	*93.5*			**0**	*80-119*	*%REC*	*1*	*08-Oct-2020 20:59*
Surr: Toluene-d8	*96.6*			**0**	*89-112*	*%REC*	*1*	*08-Oct-2020 20:59*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 14:14

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

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP-50 OCTOBER 2020 WorkOrder:HS20100103
Sample ID: 50WW05-201001 Lab ID:HS20100103-02
Collection Date: 01-Oct-2020 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-Dichloroethene	**7.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	08-Oct-2020 17:47
1,2-Dichloroethane	**3.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	08-Oct-2020 17:47
cis-1,2-Dichloroethene	**280**		**2.0**	**5.0**	**10**	**UG/L**	10	08-Oct-2020 18:59
Tetrachloroethene	**0.75**	J	**0.30**	**0.50**	**1.0**	**UG/L**	1	08-Oct-2020 17:47
Trichloroethene	**370**		**2.0**	**5.0**	**10**	**UG/L**	10	08-Oct-2020 18:59
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	08-Oct-2020 17:47
Surr: 1,2-Dichloroethane-d4	*93.6*			**0**	*81-118*	*%REC*	*1*	*08-Oct-2020 17:47*
Surr: 1,2-Dichloroethane-d4	*93.6*			**0**	*81-118*	*%REC*	*10*	*08-Oct-2020 18:59*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*1*	*08-Oct-2020 17:47*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*10*	*08-Oct-2020 18:59*
Surr: Dibromofluoromethane	*94.2*			**0**	*80-119*	*%REC*	*1*	*08-Oct-2020 17:47*
Surr: Dibromofluoromethane	*94.8*			**0**	*80-119*	*%REC*	*10*	*08-Oct-2020 18:59*
Surr: Toluene-d8	*97.8*			**0**	*89-112*	*%REC*	*1*	*08-Oct-2020 17:47*
Surr: Toluene-d8	*98.3*			**0**	*89-112*	*%REC*	*10*	*08-Oct-2020 18:59*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 14:14

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

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP-50 OCTOBER 2020 WorkOrder:HS20100103
Sample ID: Trip Blank-201001 Lab ID:HS20100103-03
Collection Date: 01-Oct-2020 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-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Oct-2020 20:35
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Oct-2020 20:35
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Oct-2020 20:35
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Oct-2020 20:35
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Oct-2020 20:35
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	08-Oct-2020 20:35
Surr: 1,2-Dichloroethane-d4	*91.4*			**0**	*81-118*	*%REC*	*1*	*08-Oct-2020 20:35*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*1*	*08-Oct-2020 20:35*
Surr: Dibromofluoromethane	*93.6*			**0**	*80-119*	*%REC*	*1*	*08-Oct-2020 20:35*
Surr: Toluene-d8	*98.6*			**0**	*89-112*	*%REC*	*1*	*08-Oct-2020 20:35*

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

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 OCTOBER 2020
WorkOrder: HS20100103

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R370141 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS20100103-03	Trip Blank-201001	01 Oct 2020 00:00			08 Oct 2020 20:35	1
Batch ID: R370141 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20100103-01	50WW29-201001	01 Oct 2020 12:30			08 Oct 2020 20:59	1
HS20100103-02	50WW05-201001	01 Oct 2020 13:15			08 Oct 2020 18:59	10
HS20100103-02	50WW05-201001	01 Oct 2020 13:15			08 Oct 2020 17:47	1
Batch ID: R370673 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS20100103-01	50WW29-201001	01 Oct 2020 12:30			16 Oct 2020 14:14	1
HS20100103-02	50WW05-201001	01 Oct 2020 13:15			16 Oct 2020 14:14	1

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 OCTOBER 2020
WorkOrder: HS20100103

QC BATCH REPORT

Batch ID: R370141 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200108** Units: **UG/L** Analysis Date: **08-Oct-2020 13:22**
Client ID: Run ID: **VOA6_370141** SeqNo: **5772406** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
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
Tetrachloroethene	1.0	1.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*45.45*	*1.0*	*50*	*0*	*90.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.43*	*1.0*	*50*	*0*	*107*	*85 - 114*				
Surr: Dibromofluoromethane	*46.76*	*1.0*	*50*	*0*	*93.5*	*80 - 119*				
Surr: Toluene-d8	*49.28*	*1.0*	*50*	*0*	*98.6*	*89 - 112*				

LCS Sample ID: **VLCSW-200108** Units: **UG/L** Analysis Date: **08-Oct-2020 12:34**
Client ID: Run ID: **VOA6_370141** SeqNo: **5772405** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	20.03	1.0	20	0	100	71 - 131				
1,2-Dichloroethane	19.53	1.0	20	0	97.6	73 - 128				
cis-1,2-Dichloroethene	19.53	1.0	20	0	97.7	78 - 123				
Tetrachloroethene	19.59	1.0	20	0	98.0	74 - 129				
Trichloroethene	19.52	1.0	20	0	97.6	79 - 123				
Vinyl chloride	19.52	1.0	20	0	97.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.31*	*1.0*	*50*	*0*	*96.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.07*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*47.4*	*1.0*	*50*	*0*	*94.8*	*80 - 119*				
Surr: Toluene-d8	*47.9*	*1.0*	*50*	*0*	*95.8*	*89 - 112*				

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 OCTOBER 2020
WorkOrder: HS20100103

QC BATCH REPORT

Batch ID: R370141 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS20100283-03MS** Units: **UG/L** Analysis Date: **08-Oct-2020 18:11**
Client ID: Run ID: **VOA6_370141** SeqNo: **5772418** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	25.88	1.0	20	0	129	71 - 131				
1,2-Dichloroethane	23.07	1.0	20	0	115	73 - 128				
cis-1,2-Dichloroethene	23.83	1.0	20	0	119	78 - 123				
Tetrachloroethene	23.99	1.0	20	0	120	74 - 129				
Trichloroethene	24.07	1.0	20	0	120	79 - 123				
Vinyl chloride	23.53	1.0	20	0	118	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.99*	*1.0*	*50*	*0*	*92.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.78*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*47.78*	*1.0*	*50*	*0*	*95.6*	*80 - 119*				
Surr: Toluene-d8	*48.23*	*1.0*	*50*	*0*	*96.5*	*89 - 112*				

MSD Sample ID: **HS20100283-03MSD** Units: **UG/L** Analysis Date: **08-Oct-2020 18:35**
Client ID: Run ID: **VOA6_370141** SeqNo: **5772419** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	24.17	1.0	20	0	121	71 - 131	25.88	6.84	20	
1,2-Dichloroethane	22.31	1.0	20	0	112	73 - 128	23.07	3.37	20	
cis-1,2-Dichloroethene	23.29	1.0	20	0	116	78 - 123	23.83	2.29	20	
Tetrachloroethene	23.46	1.0	20	0	117	74 - 129	23.99	2.24	20	
Trichloroethene	23.55	1.0	20	0	118	79 - 123	24.07	2.16	20	
Vinyl chloride	21.67	1.0	20	0	108	58 - 137	23.53	8.23	20	
Surr: 1,2-Dichloroethane-d4	*46.36*	*1.0*	*50*	*0*	*92.7*	*81 - 118*	*45.99*	*0.785*	*20*	
Surr: 4-Bromofluorobenzene	*52.77*	*1.0*	*50*	*0*	*106*	*85 - 114*	*52.78*	*0.0282*	*20*	
Surr: Dibromofluoromethane	*47.96*	*1.0*	*50*	*0*	*95.9*	*80 - 119*	*47.78*	*0.384*	*20*	
Surr: Toluene-d8	*48.02*	*1.0*	*50*	*0*	*96.0*	*89 - 112*	*48.23*	*0.434*	*20*	

The following samples were analyzed in this batch: HS20100103-01 HS20100103-02 HS20100103-03

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 OCTOBER 2020
WorkOrder: **HS20100103**

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: 16-Oct-20

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	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	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2020-2021	30-Apr-2021
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 OCTOBER 2020
Work Order: HS20100103

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20100103-01	50WW29-201001	Login	10/3/2020 8:11:36 AM	NDR	Sub
HS20100103-01	50WW29-201001	Login	10/3/2020 8:11:36 AM	NDR	Disposed
HS20100103-02	50WW05-201001	Login	10/3/2020 8:11:36 AM	NDR	Sub
HS20100103-02	50WW05-201001	Login	10/3/2020 8:11:36 AM	NDR	Disposed
HS20100103-03	Trip Blank-201001	Login	10/3/2020 8:11:36 AM	NDR	Sub
HS20100103-03	Trip Blank-201001	Login	10/3/2020 8:11:36 AM	NDR	Disposed

ALS Houston, US Date: 16-Oct-20

Sample Receipt Checklist

Work Order ID: HS20100103 **Date/Time Received:** **02-Oct-2020 09:40**

Client Name: CBI-Houston **Received by:** **Nilesh D. Ranchod**

Completed By: */S/ Nilesh D. Ranchod* (eSignature) 03-Oct-2020 08:17 (Date/Time) **Reviewed by:** */S/ RJ Modashia* (eSignature) 05-Oct-2020 10:56 (Date/Time)

Matrices: **GW** 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:N/A
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 uC/C		IR 31
Cooler(s)/Kit(s):	Blue		
Date/Time sample(s) sent to storage:	10/02/2020 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:

01078229

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 ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS LONGHORN	Project No. 501032
Job: **LHAAP50 October 2020**	
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 (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW6850	Remarks (Preservatives, etc.)	Lab I.D.#
50WW29-201001	WG	10/1/20/1230		4	X					X		
50WW05-201001	WG	10/1/20/1315		4	X					X		
Trip Blank-201001	W	10/1/20		2	X							

HS20100103

Aptim Environmental & Infrastucture, Inc.

LHAAP-50 OCTOBER 2020

Additional Remarks: **Standard TAT on all parameters. Please email results to Susan.Huang@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	10/1/20	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Mussmann	10/2/20	09:40							

Remarks:

Cooler - Blue 1K31

Temp 1.3°C CFO

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

Bme

CUSTODY SEAL	Seal Broken By:
Date: 10/1/20 Time: 1430	SM
Name: Scott Beesinger	Date: 10/02/20
Company: BHMTA	

Bme OCT 0 2 2020

Must Deliver Next Business Day
Time and Tempature Sensitive!

Bme

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
ARTIM
1203-B EAST GRAND AVE.
PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 21SEP20
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 26x14x14 IN

551C6/1545/104C

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5666
REF: LHAAP-50-BO 73885-RJ

RMA:

FedEx Express

J151110100001uu

FedEx.
TRK# 0221 1891 8880 4955

FRI - 02 OCT AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FID: 162785 010ct2020 GGGA 56DG2/A27E/05A2

October 16, 2020 Service Request No:E2000943

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: HS20100103

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 05, 2020
For your reference, these analyses have been assigned our service request number **E2000943.**

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.:**	E2000943
Project:	HS20100103	**Date Received:**	10/05/20
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 IV. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Two samples were received for analysis at ALS Environmental in Houston on 10/05/20.

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:

EQ2000497: 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 & LCSD recoveries are within QC limits. The MS/MSD was performed on an unrelated sample.

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
Project: HS20100103

Service Request:E2000943

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2000943-001	50WW29-201001	10/1/2020	1230
E2000943-002	50WW05-201001	10/1/2020	1315

Service Request Summary

Folder #: **E2000943**
Client Name: ALS Environmental - US
Project Name: HS20100103
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: 10/05/20
Internal Due Date: 10/16/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20100103
EDD: No EDD Specified

2 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 7A
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2000943-001	50WW29-201001	Ground Water	10/01/20 1230	**IV**
E2000943-002	50WW05-201001	Ground Water	10/01/20 1315	**IV**

Service Request Summary

Folder #: **E2000943**
Client Name: ALS Environmental - US
Project Name: HS20100103
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: 10/05/20
Internal Due Date: 10/16/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20100103
EDD: No EDD Specified

2 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 7A
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	2	Level II due 10/16,level IV 10/23

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.
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.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

Data Qualifiers

Lab 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	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
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	LA028-2020	12/31/2020
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Minnesota Department of Health	1785988	12/31/2020
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
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	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022
Washington Department of Health	C819	11/14/2020

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: **Texas** **COC ID:** **14821**

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:	HS20100103
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20100103-01**	**50WW29-201001**	**Groundwater**	**01 Oct 2020 12:30**
	SUB_Perch-6850			16 Oct 2020
2.	**HS20100103-02**	**50WW05-201001**	**Groundwater**	**01 Oct 2020 13:15**
	SUB_Perch-6850			16 Oct 2020

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: 10/2/20 1000

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

Cooler Receipt Form

Project Chemist CH

Client/Project ALS-HH

Thermometer ID IR51

Date/Time Received: 10/15/20

Initials: CH

Date/Time Logged in: 10/15/20

Initials CH

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?
-		10/15/20	1200	CH	1.9	☑
						☐
						☐
						☐

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#: 367345 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/KBROWN **Prep Method:** Method **Prep Date/Time:** 10/9/20 11:34

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2000943-001	50WW29-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2000943-002	50WW05-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2000944-001	50WW14-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2000944-002	50WW13-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2000944-003	50WW11-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2000944-004	50WW11-201001-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2000944-005	50WW06-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2000944-006	50WW12-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2000949-001	LH18/24-SP650_100620-AIX	.01	6850/ClO4 DOD			Water	10mL	
10	E2000949-002	LH18/24-SP650_100620-BIX	.01	6850/ClO4 DOD			Water	10mL	
11	E2000964-001	50WW09-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2000964-002	50WW08-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2000964-003	50WW22-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2000964-004	50WW23-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2000964-005	50WW15-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2000964-006	50WW16-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
17	E2000964-007	50WW18-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
18	E2000964-008	50WW1-201005-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
19	EQ2000497-01	MB		6850/ClO4 DOD			Liquid	10mL	
20	EQ2000497-02	LCS		6850/ClO4 DOD			Liquid	10mL	
21	EQ2000497-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
22	EQ2000497-04	50WW14-201001 MS	.02	6850/ClO4 DOD			Liquid	10mL	
23	EQ2000497-05	50WW14-201001 DMS	.03	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 209764 Logbook Ref: Perchlorate Int. Stock1 51820 Expires On: 11/18/2020

EQ2000497-02	1.00µL	EQ2000497-03	1.00µL	EQ2000497-04	1.00µL	EQ2000497-05	1.00µL

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 212340 Logbook Ref: Sodium Perchlorate Expires On: 07/13/2022

E2000943-001	100.00µL	E2000943-002	100.00µL	E2000944-001	100.00µL	E2000944-002	100.00µL	E2000944-003	100.00µL	E2000944-004	100.00µL
E2000944-005	100.00µL	E2000944-006	100.00µL	E2000949-001	100.00µL	E2000949-002	100.00µL	E2000964-001	100.00µL	E2000964-002	100.00µL
E2000964-003	100.00µL	E2000964-004	100.00µL	E2000964-005	100.00µL	E2000964-006	100.00µL	E2000964-007	100.00µL	E2000964-008	100.00µL
EQ2000497-01	100.00µL	EQ2000497-02	100.00µL	EQ2000497-03	100.00µL	EQ2000497-04	100.00µL	EQ2000497-05	100.00µL		

Preparation Information Benchsheet

Prep Run#: 367345
Team: Semivoa GCMS/KBROWN
Prep WorkFlow: GenExt28Day
Prep Method: Method
Status: Prepped
Prep Date/Time: 10/9/20 11:34

Preparation Steps

Step: Preparation
Started: 10/9/20 11:34
Finished: 10/9/20 13:30
By: KBROWN
Comments

Comments: _____

Reviewed By: GR Date: 10/10/2020

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:**	E2000943
Project:	HS20100103	**Date Collected:**	10/ 1/20 1230
Sample Matrix:	Ground Water	**Date Received:**	10/ 5/20
Sample Name:	50WW29-201001	**Units:**	µg/L
Lab Code:	E2000943-001	**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	**5.96**		0.200	0.100	0.0500	2	10/ 9/20	10/16/20 11:06	367345	699559	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000943
Project:	HS20100103	**Date Collected:**	10/ 1/20 1315
Sample Matrix:	Ground Water	**Date Received:**	10/ 5/20
Sample Name:	50WW05-201001	**Units:**	µg/L
Lab Code:	E2000943-002	**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	**0.621**		0.100	0.0500	0.0250	1	10/ 9/20	10/16/20 09:41	367345	699559	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000943
Project:	HS20100103	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2000497-01	**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	10/ 9/20	10/9/20 15:24	367345	698929	

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:**	E2000943
Project:	HS20100103	**Date Analyzed:**	10/ 9/20
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:**	NA
		Extraction Lot:	367345

	Lab Control Sample EQ2000497-02			Duplicate Lab Control Sample EQ2000497-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0996	0.100	100	0.111	0.100	111	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:**	E2000943
Project:	HS20100103	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000497-02	**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	**0.0996**	J	0.100	0.0500	0.0250	1	10/ 9/20	10/9/20 15:32	367345	698929	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000943
Project:	HS20100103	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000497-03	**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	**0.111**		0.100	0.0500	0.0250	1	10/ 9/20	10/9/20 15:40	367345	698929	

Initial Calibration

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20200915

ALS Environmental

ICAL Date: 9/15/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000032**

1st Review: Grivera
2nd Review: Hvan

Injection Log
LCMS01 -Shimadzu 8050

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	PERCHLORATE1		20200915_044	Perchlorate6850b.lcm	1x	☒	3100806-05	9/15/2020 17:55
2	PERCHLORATE2		20200915_024	Perchlorate6850b.lcm	1x	☒	3100806-06	9/15/2020 15:10
3	PERCHLORATE3		20200915_046	Perchlorate6850b.lcm	1x	☒	3100806-07	9/15/2020 18:13
4	PERCHLORATE4		20200915_047	Perchlorate6850b.lcm	1x	☒	3100807-01	9/15/2020 18:21
5	PERCHLORATE5		20200915_048	Perchlorate6850b.lcm	1x	☒	3100807-02	9/15/2020 18:29
6	PERCHLORATE6		20200915_049	Perchlorate6850b.lcm	1x	☒	3100807-03	9/15/2020 18:37
7	PERCHLORATE7		20200915_029	Perchlorate6850b.lcm	1x	☒	3100807-04	9/15/2020 15:49
8	PERCHLORATE8		20200915_051	Perchlorate6850b.lcm	1x	☒	3100807-05	9/15/2020 18:52
9	PERCHLORATE9		20200915_052	Perchlorate6850b.lcm	1x	☒	3100807-06	9/15/2020 19:00
10	PERCHLORATE10		20200915_053	Perchlorate6850b.lcm	1x	☒	3100807-07	9/15/2020 19:08
11	PERCHLORATE ICV		20200915_054	Perchlorate6850b.lcm	1x	☒	3100807-08	9/15/2020 19:16
12	LODV		20200915_055	Perchlorate6850b.lcm	1x	☒		9/15/2020 19:24
13	E2000817-001		20200915_056	Perchlorate6850b.lcm	1x	☒		9/15/2020 19:40
14	E2000817-001x10		20200915_057	Perchlorate6850b.lcm	1x	☒		9/15/2020 19:48
15	PERCHLORATE7		20200915_058	Perchlorate6850b.lcm	1x	☒	3100807-04	9/15/2020 19:56
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								

Initial Calibration - Detailed Report

Calibration ID: EC2000032 **Instrument ID:** E-LCMS-01
Column Name: 1

#	Lab Code	Sample Name	File Location	Aquisition Date
01	EC2000032-01	PERCHLORATE2	20200915_024	09/15/2020 15:10
02	EC2000032-02	PERCHLORATE7	20200915_029	09/15/2020 15:49
03	EC2000032-03	PERCHLORATE1	20200915_044	09/15/2020 17:55
04	EC2000032-04	PERCHLORATE3	20200915_046	09/15/2020 18:13
05	EC2000032-05	PERCHLORATE4	20200915_047	09/15/2020 18:21
06	EC2000032-06	PERCHLORATE5	20200915_048	09/15/2020 18:29
07	EC2000032-07	PERCHLORATE6	20200915_049	09/15/2020 18:37
08	EC2000032-08	PERCHLORATE8	20200915_051	09/15/2020 18:52
09	EC2000032-09	PERCHLORATE9	20200915_052	09/15/2020 19:00
10	EC2000032-10	PERCHLORATE10	20200915_053	09/15/2020 19:08

Analyte **Curve Fit** **Weighting**

Perchlorate **Quadratic** **Equal** **COD = 0.9998** **Y= -9.474E-05 X² + 0.1066 X + 0.00148**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5000	0.1319	02	10.0000	0.1001	03	0.1000	0.1399	04	0.7000	0.1079
05	1.0000	0.1089	06	2.0000	0.1096	07	5.0000	0.1086	08	20.0000	0.1062
09	30.0000	0.104	10	50.0000	0.1018						

Analyte

Perchlorate

#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D
01	0.5000	0.605	21.0	02	10.0000	9.45	-5.5	03	0.1000	0.117	17.3
04	0.7000	0.695	-0.8	05	1.0000	1.01	0.8	06	2.0000	2.05	2.3
07	5.0000	5.10	2.0	08	20.0000	20.3	1.3	09	30.0000	30.1	0.2
10	50.0000	50.0	-0.1								

Initial Calibration Verification Summary Report

Calibration ID:	EC2000032	**Instrument ID:**	E-LCMS-01
Datafile ID:	20200915_054	**Column Name:**	1

Analyte	Lab Code	Type	Curve Fit	True Value	Calc Conc	Units	Result	Criteria
Perchlorate	EC2000032-11	T	Quadratic	10	9.462	ng/mL	-5.4	<= 15

ALS Group Houston

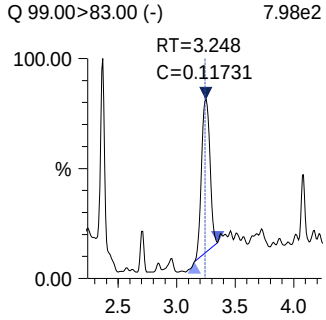
PERCHLORATE1

Date acquired: 9/15/2020 5:55:29 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_044.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE1	9/15/2020 5:55:29 PM	2833	0.11731	20200915_044	3.248	25.0000	1.0000	5
Sodium Perchlorate-18O4_IS	PERCHLORATE1	9/15/2020 5:55:29 PM	202512	1.00000	20200915_044	3.237	25.0000	1.0000	5

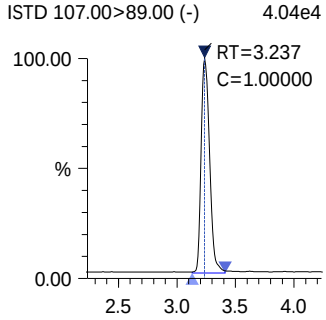
Perchlorate

Conc 0.11731
Area 2833



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 202512



ALS Group Houston

PERCHLORATE2

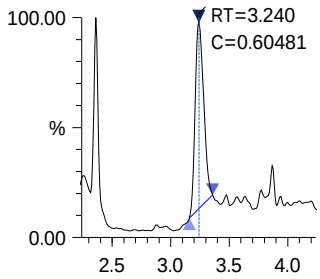
Date acquired: 9/15/2020 3:10:04 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_024.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE2	9/15/2020 3:10:04 PM	11634	0.60481	20200915_024	3.240	25.0000	1.0000	6
Sodium Perchlorate-18O4_IS	PERCHLORATE2	9/15/2020 3:10:04 PM	176422	1.00000	20200915_024	3.240	25.0000	1.0000	6

Perchlorate

Conc 0.60481
Area 11634

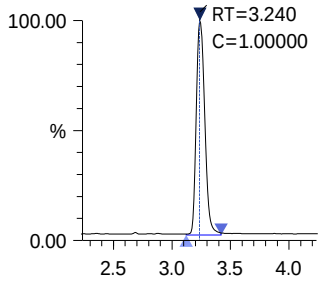
Q 99.00>83.00 (-) 2.66e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 176422

ISTD 107.00>89.00 (-) 3.50e4



ALS Group Houston

PERCHLORATE3

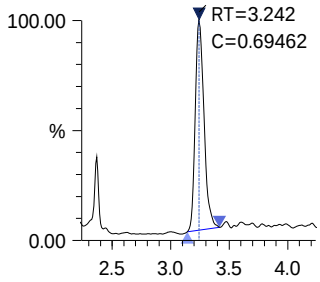
Date acquired: 9/15/2020 6:13:20 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_046.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE3	9/15/2020 6:13:20 PM	14722	0.69462	20200915_046	3.242	25.0000	1.0000	7
Sodium Perchlorate-18O4_IS	PERCHLORATE3	9/15/2020 6:13:20 PM	194971	1.00000	20200915_046	3.239	25.0000	1.0000	7

Perchlorate

Conc 0.69462
Area 14722

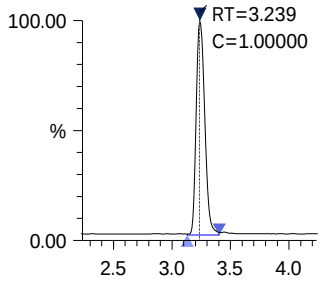
Q 99.00>83.00 (-) 2.91e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 194971

ISTD 107.00>89.00 (-) 3.85e4



ALS Group Houston

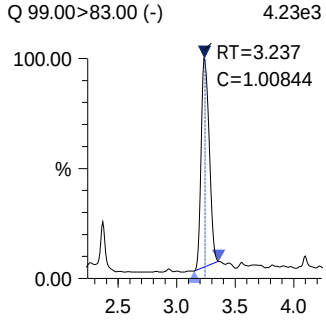
PERCHLORATE4

Date acquired: 9/15/2020 6:21:15 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_047.lcd
Vial: 8 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE4	9/15/2020 6:21:15 PM	19524	1.00844	20200915_047	3.237	25.0000	1.0000	8
Sodium Perchlorate-18O4_IS	PERCHLORATE4	9/15/2020 6:21:15 PM	179246	1.00000	20200915_047	3.240	25.0000	1.0000	8

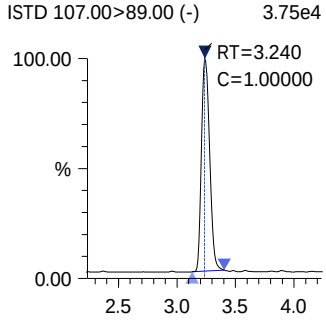
Perchlorate

Conc 1.00844
Area 19524



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 179246



ALS Group Houston

PERCHLORATE5

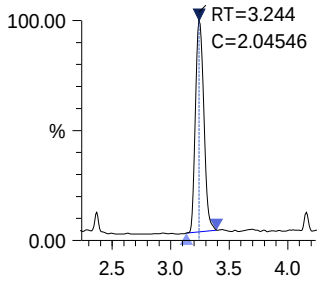
Date acquired: 9/15/2020 6:29:08 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_048.lcd
Vial: 9 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE5	9/15/2020 6:29:08 PM	38522	2.04546	20200915_048	3.244	25.0000	1.0000	9
Sodium Perchlorate-18O4_IS	PERCHLORATE5	9/15/2020 6:29:08 PM	175734	1.00000	20200915_048	3.240	25.0000	1.0000	9

Perchlorate

Conc 2.04546
Area 38522

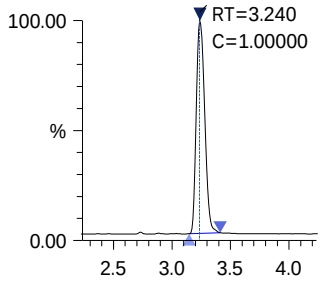
Q 99.00>83.00 (-) 7.92e3



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 175734

ISTD 107.00>89.00 (-) 3.56e4



ALS Group Houston

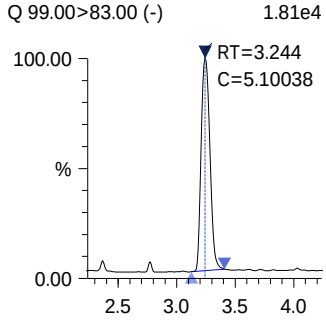
PERCHLORATE6

Date acquired: 9/15/2020 6:37:05 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_049.lcd
Vial: 10 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE6	9/15/2020 6:37:05 PM	92162	5.10038	20200915_049	3.244	25.0000	1.0000	10
Sodium Perchlorate-18O4_IS	PERCHLORATE6	9/15/2020 6:37:05 PM	169754	1.00000	20200915_049	3.239	25.0000	1.0000	10

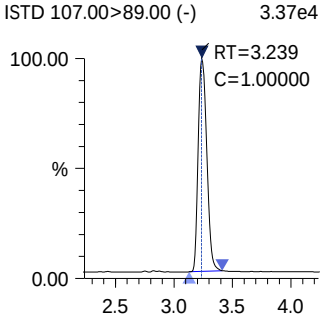
Perchlorate

Conc 5.10038
Area 92162



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 169754



ALS Group Houston

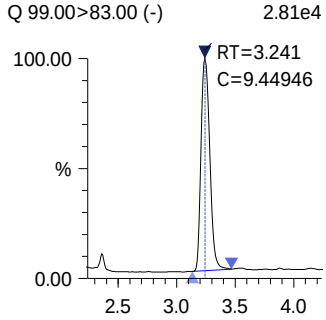
PERCHLORATE7

Date acquired: 9/15/2020 3:49:35 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_029.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	9/15/2020 3:49:35 PM	144012	9.44946	20200915_029	3.241	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	9/15/2020 3:49:35 PM	143911	1.00000	20200915_029	3.238	25.0000	1.0000	4

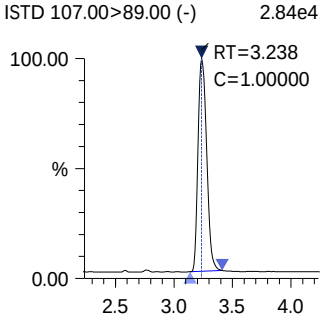
Perchlorate

Conc 9.44946
Area 144012



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 143911



ALS Group Houston

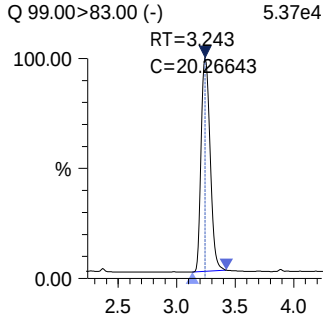
PERCHLORATE8

Date acquired: 9/15/2020 6:52:54 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_051.lcd
Vial: 11 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE8	9/15/2020 6:52:54 PM	284308	20.26643	20200915_051	3.243	25.0000	1.0000	11
Sodium Perchlorate-18O4_IS	PERCHLORATE8	9/15/2020 6:52:54 PM	133870	1.00000	20200915_051	3.240	25.0000	1.0000	11

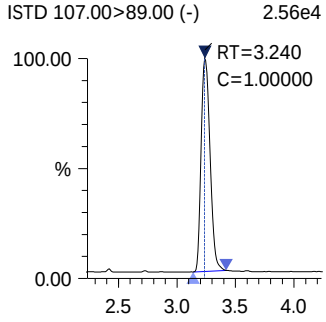
Perchlorate

Conc 20.26643
Area 284308



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 133870



ALS Group Houston

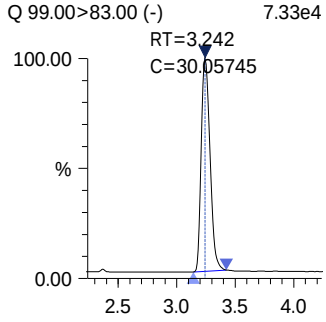
PERCHLORATE9

Date acquired: 9/15/2020 7:00:50 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_052.lcd
Vial: 12 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE9	9/15/2020 7:00:50 PM	377183	30.05745	20200915_052	3.242	25.0000	1.0000	12
Sodium Perchlorate-18O4_IS	PERCHLORATE9	9/15/2020 7:00:50 PM	120846	1.00000	20200915_052	3.240	25.0000	1.0000	12

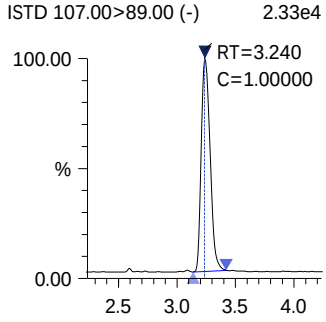
Perchlorate

Conc 30.05745
Area 377183



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 120846



ALS Group Houston

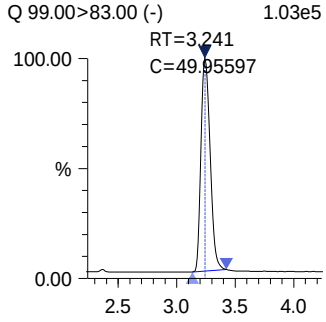
PERCHLORATE10

Date acquired: 9/15/2020 7:08:43 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_053.lcd
Vial: 13 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE10	9/15/2020 7:08:43 PM	553330	49.95597	20200915_053	3.241	25.0000	1.0000	13
Sodium Perchlorate-18O4_IS	PERCHLORATE10	9/15/2020 7:08:43 PM	108660	1.00000	20200915_053	3.240	25.0000	1.0000	13

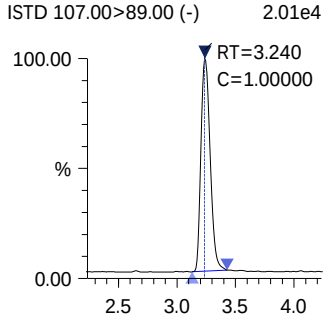
Perchlorate

Conc 49.95597
Area 553330



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 108660



ALS Group Houston

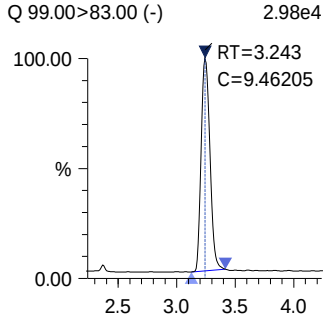
PERCHLORATEICV

Date acquired: 9/15/2020 7:16:39 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_054.lcd
Vial: 14 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATEICV	9/15/2020 7:16:39 PM	152650	9.46205	20200915_054	3.243	25.0000	1.0000	14
Sodium Perchlorate-18O4_IS	PERCHLORATEICV	9/15/2020 7:16:39 PM	152342	1.00000	20200915_054	3.241	25.0000	1.0000	14

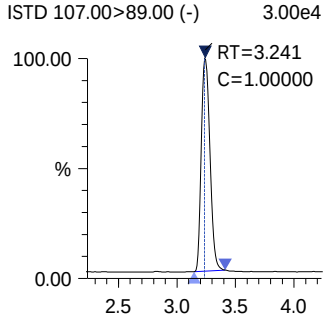
Perchlorate

Conc 9.46205
Area 152650



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 152342



Chromatograms and Selected Ion Monitoring

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 320, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20201009

ALS Environmental

ICAL Date: 9/15/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000032**

1st Review: Grivera
2nd Review: Kneir

Injection Log
LCMS01 -Shimadzu 8050

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	null		20201009_001	Perchlorate6850b.lcm	1x	☒		10/9/2020 13:57
2	null		20201009_002	Perchlorate6850b.lcm	1x	☒		10/9/2020 14:02
3	IB		20201009_003	Perchlorate6850b.lcm	1x	☒		10/9/2020 14:52
4	LODV		20201009_004	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:00
5	PERCHLORATE7		20201009_005	Perchlorate6850b.lcm	1x	☒	3100807-04	10/9/2020 15:08
6	ICS		20201009_006	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:16
7	EQ2000497-01		20201009_007	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:24
8	EQ2000497-02		20201009_008	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:32
9	EQ2000497-03		20201009_009	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:40
10	EQ2000497-04		20201009_010	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:48
11	EQ2000497-05		20201009_011	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:55
12	E2000943-001		20201009_012	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:03
13	E2000943-002		20201009_013	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:11
14	E2000944-001		20201009_014	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:19
15	E2000944-002		20201009_015	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:27
16	E2000944-003		20201009_016	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:35
17	PERCHLORATE7		20201009_017	Perchlorate6850b.lcm	1x	☒	3100807-04	10/9/2020 16:43
18	E2000944-004		20201009_018	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:51
19	E2000944-005		20201009_019	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:58
20	E2000944-006		20201009_020	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:06
21	E2000949-001		20201009_021	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:14
22	E2000949-002		20201009_022	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:22
23	E2000964-001		20201009_023	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:30
24	E2000964-002		20201009_024	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:38
25	E2000964-003		20201009_025	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:46
26	E2000964-004		20201009_026	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:54
27	E2000964-005		20201009_027	Perchlorate6850b.lcm	1x	☒		10/9/2020 18:02
28	PERCHLORATE7		20201009_028	Perchlorate6850b.lcm	1x	☒	3100807-04	10/9/2020 18:10
29	E2000964-006		20201009_029	Perchlorate6850b.lcm	1x	☒		10/9/2020 18:17
30	E2000964-007		20201009_030	Perchlorate6850b.lcm	1x	☒		10/9/2020 18:25
31	E2000964-008		20201009_031	Perchlorate6850b.lcm	1x	☒		10/9/2020 18:33
32	PERCHLORATE7		20201009_032	Perchlorate6850b.lcm	1x	☒	3100807-04	10/9/2020 18:41
33								
34								
35								
36								
37								
38								
39								

20201016

ALS Environmental

ICAL Date: 9/15/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000032**

1st Review: Grivera
2nd Review: Kneir

Injection Log
LCMS01 -Shimadzu 8050

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	null		20201016_001	Perchlorate6850b.lcm	1x	☒		10/16/2020 8:39
2	null		20201016_002	Perchlorate6850b.lcm	1x	☒		10/16/2020 8:44
3	IB		20201016_003	Perchlorate6850b.lcm	1x	☒		10/16/2020 8:49
4	IB		20201016_004	Perchlorate6850b.lcm	1x	☒		10/16/2020 8:57
5	LODV		20201016_005	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:05
6	ICS		20201016_006	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:13
7	PERCHLORATE7		20201016_007	Perchlorate6850b.lcm	1x	☒	3100807-04	10/16/2020 9:21
8	E2000943-001		20201016_008	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:33
9	E2000943-002		20201016_009	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:41
10	E2000944-001		20201016_010	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:49
11	E2000944-002		20201016_011	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:57
12	E2000944-003		20201016_012	Perchlorate6850b.lcm	1x	☒		10/16/2020 10:04
13	E2000944-004		20201016_013	Perchlorate6850b.lcm	1x	☒		10/16/2020 10:12
14	E2000944-005		20201016_014	Perchlorate6850b.lcm	1x	☒		10/16/2020 10:20
15	E2000944-006		20201016_015	Perchlorate6850b.lcm	1x	☒		10/16/2020 10:28
16	PERCHLORATE7		20201016_018	Perchlorate6850b.lcm	1x	☒	3100807-04	10/16/2020 10:52
17	E2000943-001X2		20201016_019	Perchlorate6850b.lcm	2x	☒		10/16/2020 11:06
18	E2000944-001X10		20201016_020	Perchlorate6850b.lcm	10x	☒		10/16/2020 11:14
19	E2000944-002X200		20201016_021	Perchlorate6850b.lcm	200x	☒		10/16/2020 11:22
20	E2000944-003X200		20201016_022	Perchlorate6850b.lcm	200x	☒		10/16/2020 11:30
21	E2000944-004X200		20201016_023	Perchlorate6850b.lcm	200x	☒		10/16/2020 11:38
22	E2000944-005X100		20201016_024	Perchlorate6850b.lcm	100x	☒		10/16/2020 11:46
23	E2000944-006X1000		20201016_025	Perchlorate6850b.lcm	1000x	☒		10/16/2020 11:54
24	EQ2000497-05		20201016_027	Perchlorate6850b.lcm	10x	☒		10/16/2020 12:09
25	PERCHLORATE7		20201016_028	Perchlorate6850b.lcm	1x	☒	3100807-04	10/16/2020 12:17
26	EQ2000497-04		20201016_029	Perchlorate6850b.lcm	10x	☒		10/16/2020 12:25
27	PERCHLORATE7		20201016_030	Perchlorate6850b.lcm	1x	☒	3100807-04	10/16/2020 12:36
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20100103

Service Request: E2000943
Date Analyzed: 10/16/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201016\20201016_007

Calibration Date: 9/15/20
Calibration ID: EC2000032
Analysis Lot: 699559
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.82	NA	NA	NA	-1.8	± 15 %	Quadratic

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20100103

Service Request: E2000943
Date Analyzed: 10/16/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201016\20201016_018

Calibration Date: 9/15/20
Calibration ID: EC2000032
Analysis Lot: 699559
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.4	NA	NA	NA	4.3	± 15 %	Quadratic

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20100103

Service Request: E2000943
Date Analyzed: 10/16/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201016\20201016_028

Calibration Date: 9/15/20
Calibration ID: EC2000032
Analysis Lot: 699559
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.2	NA	NA	NA	1.8	± 15 %	Quadratic

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20100103

Service Request: E2000943
Date Analyzed: 10/16/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201016\20201016_030

Calibration Date: 9/15/20
Calibration ID: EC2000032
Analysis Lot: 699559
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.2	NA	NA	NA	2.2	± 15 %	Quadratic

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000943
Project:	HS20100103	**Date Analyzed:**	10/16/20 09:21

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201016\20201016_007	**Lab Code:**	EQ2000509-01
Instrument ID:	E-LCMS-01	**Analysis Lot:**	699559
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	160,593	3.24
	Upper Limit ==>	240,890	5.24
	Lower Limit ==>	80,297	1.24
Associated Analyses			
Continuing Calibration Verification	EQ2000509-01	140,874	3.09
50WW05-201001	E2000943-002	98,162	3.08

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000943
Project:	HS20100103	**Date Analyzed:**	10/16/20 10:52

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201016\20201016_018	**Lab Code:**	EQ2000509-02
Instrument ID:	E-LCMS-01	**Analysis Lot:**	699559
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	160,593	3.24
	Upper Limit ==>	240,890	5.24
	Lower Limit ==>	80,297	1.24
Associated Analyses			
Continuing Calibration Verification	EQ2000509-02	134,004	3.10
50WW29-201001	E2000943-001	81,235	3.03
Batch QC	E2000944-001	127,843	3.09
Batch QCDMS	EQ2000497-05	124,382	3.09

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000943
Project:	HS20100103	**Date Analyzed:**	10/16/20 12:17

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201016\20201016_028	**Lab Code:**	EQ2000509-03
Instrument ID:	E-LCMS-01	**Analysis Lot:**	699559
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	160,593	3.24
	Upper Limit ==>	240,890	5.24
	Lower Limit ==>	80,297	1.24
Associated Analyses			
Continuing Calibration Verification	EQ2000509-03	137,447	3.09
Batch QCMS	EQ2000497-04	138,818	3.06

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000943
Project:	HS20100103	**Date Analyzed:**	10/16/20 12:36

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201016\20201016_030	**Lab Code:**	EQ2000509-04
Instrument ID:	E-LCMS-01	**Analysis Lot:**	699559
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	160,593	3.24
	Upper Limit ==>	240,890	5.24
	Lower Limit ==>	80,297	1.24
Associated Analyses			
Continuing Calibration Verification	EQ2000509-04	140,968	3.05

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group Houston

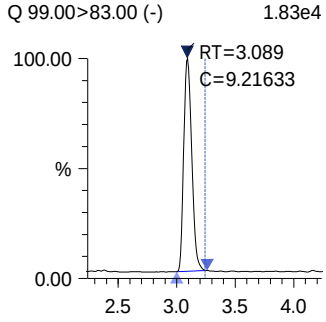
PERCHLORATE7

Date acquired: 10/9/2020 3:08:25 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201009\20201009_005.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/9/2020 3:08:25 PM	86435	9.21633	20201009_005	3.089	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/9/2020 3:08:25 PM	88538	1.00000	20201009_005	3.087	25.0000	1.0000	4

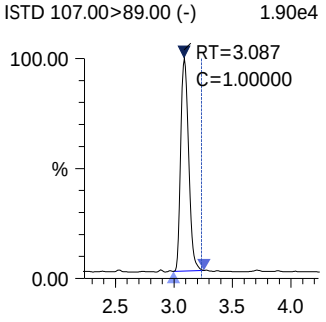
Perchlorate

Conc 9.21633
Area 86435



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 88538



ALS Group Houston

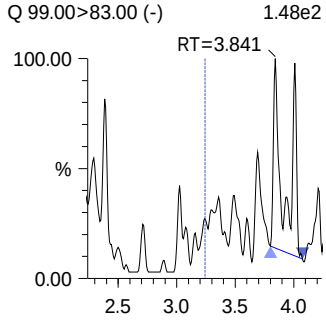
EQ2000497-01

Date acquired: 10/9/2020 3:24:21 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201009\20201009_007.lcd
Vial: 16 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000497-01	10/9/2020 3:24:21 PM	----	----	20201009_007	----	25.0000	1.0000	16
Sodium Perchlorate-18O4_IS	EQ2000497-01	10/9/2020 3:24:21 PM	96808	1.00000	20201009_007	3.098	25.0000	1.0000	16

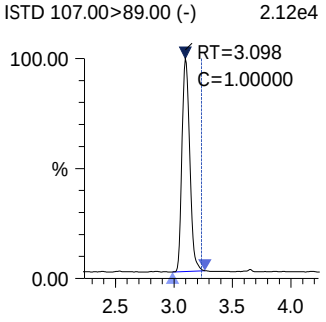
Perchlorate

Conc ----
Area ----



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 96808



ALS Group Houston

EQ2000497-02

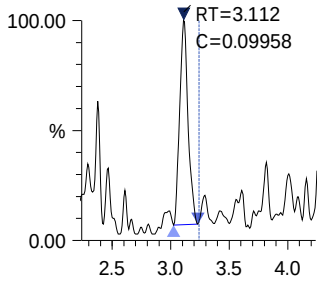
Date acquired: 10/9/2020 3:32:16 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201009\20201009_008.lcd
Vial: 17 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000497-02	10/9/2020 3:32:16 PM	1240	0.09958	20201009_008	3.112	25.0000	1.0000	17
Sodium Perchlorate-18O4_IS	EQ2000497-02	10/9/2020 3:32:16 PM	102528	1.00000	20201009_008	3.102	25.0000	1.0000	17

Perchlorate

Conc 0.09958
Area 1240

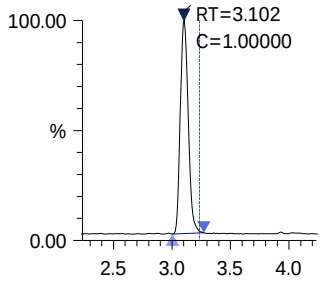
Q 99.00>83.00 (-) 2.59e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 102528

ISTD 107.00>89.00 (-) 2.19e4



ALS Group Houston

EQ2000497-03

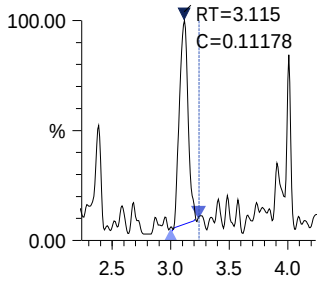
Date acquired: 10/9/2020 3:40:10 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201009\20201009_009.lcd
Vial: 18 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000497-03	10/9/2020 3:40:10 PM	1391	0.11178	20201009_009	3.115	25.0000	1.0000	18
Sodium Perchlorate-18O4_IS	EQ2000497-03	10/9/2020 3:40:10 PM	103828	1.00000	20201009_009	3.100	25.0000	1.0000	18

Perchlorate

Conc 0.11178
Area 1391

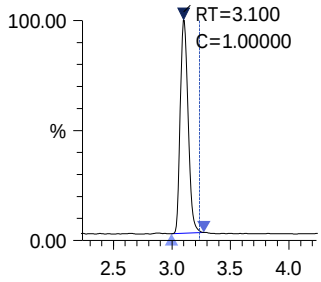
Q 99.00>83.00 (-) 3.62e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 103828

ISTD 107.00>89.00 (-) 2.24e4



ALS Group Houston

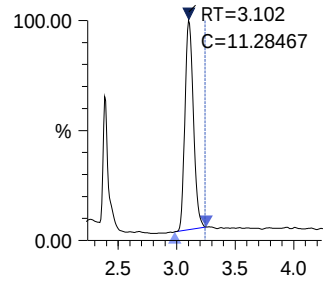
PERCHLORATE7

Date acquired: 10/9/2020 4:43:14 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201009\20201009_017.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/9/2020 4:43:14 PM	105826	11.28467	20201009_017	3.102	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/9/2020 4:43:14 PM	88721	1.00000	20201009_017	3.101	25.0000	1.0000	4

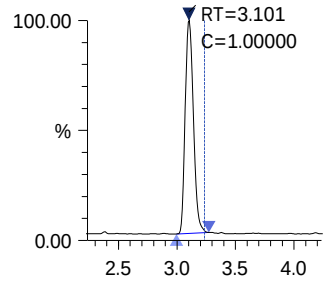
Perchlorate

Conc 11.28467
Area 105826



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 88721



ALS Group Houston

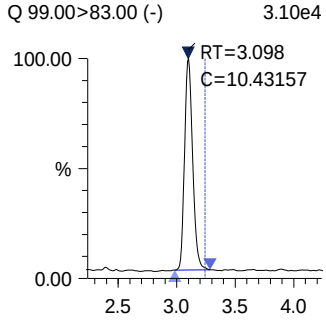
PERCHLORATE7

Date acquired: 10/16/2020 10:52:27 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201016\20201016_018.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/16/2020 10:52:27 AM	147880	10.43157	20201016_018	3.098	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/16/2020 10:52:27 AM	134004	1.00000	20201016_018	3.096	25.0000	1.0000	4

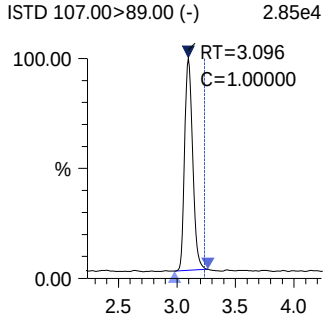
Perchlorate

Conc 10.43157
Area 147880



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 134004



ALS Group Houston

EQ2000497-05X10

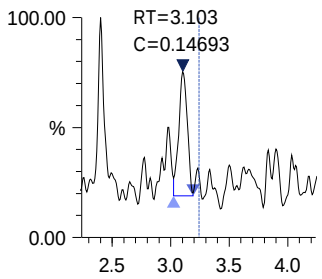
Date acquired: 10/16/2020 12:09:51 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201016\20201016_027.lcd
Vial: 28 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000497-05X10	10/16/2020 12:09:51 PM	2121	0.14693	20201016_027	3.103	25.0000	1.0000	28
Sodium Perchlorate-18O4_IS	EQ2000497-05X10	10/16/2020 12:09:51 PM	124382	1.00000	20201016_027	3.089	25.0000	1.0000	28

Perchlorate

Conc 0.14693
Area 2121

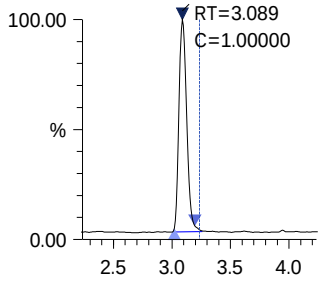
Q 99.00>83.00 (-) 7.11e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 124382

ISTD 107.00>89.00 (-) 2.93e4



ALS Group Houston

PERCHLORATE7

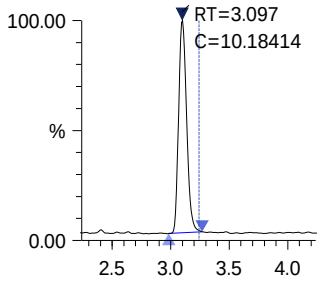
Date acquired: 10/16/2020 12:17:43 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201016\20201016_028.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/16/2020 12:17:43 PM	148120	10.18414	20201016_028	3.097	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/16/2020 12:17:43 PM	137447	1.00000	20201016_028	3.094	25.0000	1.0000	4

Perchlorate

Conc 10.18414
Area 148120

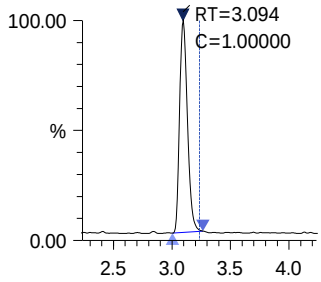
Q 99.00>83.00 (-) 3.13e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 137447

ISTD 107.00>89.00 (-) 3.01e4



ALS Group Houston

EQ2000497-04X10

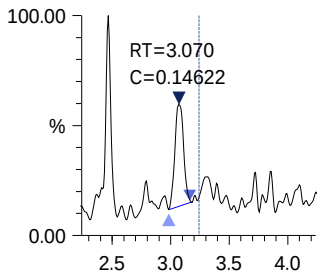
Date acquired: 10/16/2020 12:25:41 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201016\20201016_029.lcd
Vial: 27 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000497-04X10	10/16/2020 12:25:41 PM	2356	0.14622	20201016_029	3.070	25.0000	1.0000	27
Sodium Perchlorate-18O4_IS	EQ2000497-04X10	10/16/2020 12:25:41 PM	138818	1.00000	20201016_029	3.062	25.0000	1.0000	27

Perchlorate

Conc 0.14622
Area 2356

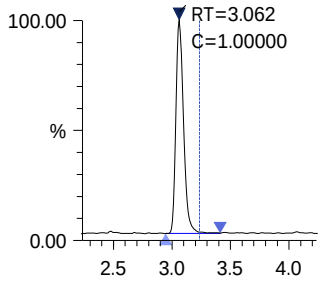
Q 99.00>83.00 (-) 1.11e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 138818

ISTD 107.00>89.00 (-) 3.08e4



ALS Group Houston

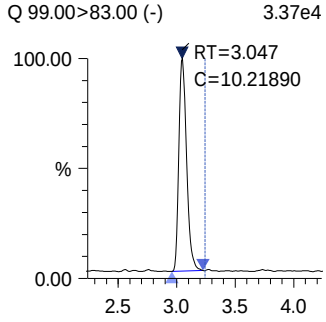
PERCHLORATE7

Date acquired: 10/16/2020 12:36:13 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201016\20201016_030.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/16/2020 12:36:13 PM	152426	10.21890	20201016_030	3.047	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/16/2020 12:36:13 PM	140968	1.00000	20201016_030	3.045	25.0000	1.0000	4

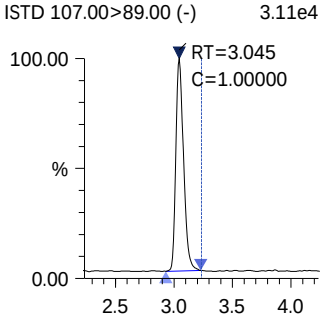
Perchlorate

Conc 10.21890
Area 152426



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 140968



10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

November 05, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS20100342**

Laboratory Results for: **LHAAP50 October 2020**

Dear Susan Huang,

ALS Environmental received 9 sample(s) on Oct 06, 2020 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: RJ.MODASHIA
RJ Modashia
Project Manager

ALS Houston, US Date: 05-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
Work Order: HS20100342

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20100342-01	50 ww09-201005	Groundwater		05-Oct-2020 08:00	06-Oct-2020 14:30	☐
HS20100342-02	50 ww08-201005	Groundwater		05-Oct-2020 08:45	06-Oct-2020 14:30	☐
HS20100342-03	50 ww22-201005	Groundwater		05-Oct-2020 09:35	06-Oct-2020 14:30	☐
HS20100342-04	50 ww23-201005	Groundwater		05-Oct-2020 10:20	06-Oct-2020 14:30	☐
HS20100342-05	50 ww15-201005	Groundwater		05-Oct-2020 11:05	06-Oct-2020 14:30	☐
HS20100342-06	50 ww16-201005	Groundwater		05-Oct-2020 11:50	06-Oct-2020 14:30	☐
HS20100342-07	50 ww18-201005	Groundwater		05-Oct-2020 12:45	06-Oct-2020 14:30	☐
HS20100342-08	50 ww18-201005-FD	Groundwater		05-Oct-2020 12:45	06-Oct-2020 14:30	☐
HS20100342-09	Trip Blank-201005	Water		05-Oct-2020 00:00	06-Oct-2020 14:30	☐

Revision:1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 05-Nov-20

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP50 October 2020
Work Order: HS20100342

Work Order Comments

- REV01: Revised to update the sample ID for HS20100342-08 to 50WW18-201005-FD
- The analysis for Methane, Methene, Ethane and CO2 by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.
- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Work Order Comments

- Analysis of Perchlorate was performed by ALS Houston TX, High Resolution. Laboratory. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R370245

Sample ID: HS20100352-03MS

- MS and MSD were performed on unrelated sample

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 05-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
Sample ID: 50 ww09-201005
Collection Date: 05-Oct-2020 08:00

ANALYTICAL REPORT
WorkOrder:HS20100342
Lab ID:HS20100342-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 13:46
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 13:46
cis-1,2-Dichloroethene	**2.8**		**0.20**	**0.50**	**1.0**	**UG/L**	1	09-Oct-2020 13:46
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Oct-2020 13:46
Trichloroethene	**21**		**0.20**	**0.50**	**1.0**	**UG/L**	1	09-Oct-2020 13:46
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 13:46
Surr: 1,2-Dichloroethane-d4	*90.9*			**0**	*81-118*	*%REC*	*1*	*09-Oct-2020 13:46*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*09-Oct-2020 13:46*
Surr: Dibromofluoromethane	*93.4*			**0**	*80-119*	*%REC*	*1*	*09-Oct-2020 13:46*
Surr: Toluene-d8	*98.5*			**0**	*89-112*	*%REC*	*1*	*09-Oct-2020 13:46*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	20-Oct-2020 16:12

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 05-Nov-20

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP50 October 2020 WorkOrder:HS20100342
Sample ID: 50 ww08-201005 Lab ID:HS20100342-02
Collection Date: 05-Oct-2020 08:45 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**1.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	09-Oct-2020 17:22
1,2-Dichloroethane	**2.2**		**0.20**	**0.50**	**1.0**	**UG/L**	1	09-Oct-2020 17:22
cis-1,2-Dichloroethene	**57**		**0.20**	**0.50**	**1.0**	**UG/L**	1	09-Oct-2020 17:22
Tetrachloroethene	**1.4**		**0.30**	**0.50**	**1.0**	**UG/L**	1	09-Oct-2020 17:22
Trichloroethene	**500**		**2.0**	**5.0**	**10**	**UG/L**	10	09-Oct-2020 21:23
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 17:22
Surr: 1,2-Dichloroethane-d4	*93.5*			**0**	*81-118*	*%REC*	*1*	*09-Oct-2020 17:22*
Surr: 1,2-Dichloroethane-d4	*90.9*			**0**	*81-118*	*%REC*	*10*	*09-Oct-2020 21:23*
Surr: 4-Bromofluorobenzene	*109*			**0**	*85-114*	*%REC*	*1*	*09-Oct-2020 17:22*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*10*	*09-Oct-2020 21:23*
Surr: Dibromofluoromethane	*95.0*			**0**	*80-119*	*%REC*	*1*	*09-Oct-2020 17:22*
Surr: Dibromofluoromethane	*94.9*			**0**	*80-119*	*%REC*	*10*	*09-Oct-2020 21:23*
Surr: Toluene-d8	*98.9*			**0**	*89-112*	*%REC*	*10*	*09-Oct-2020 21:23*
Surr: Toluene-d8	*97.3*			**0**	*89-112*	*%REC*	*1*	*09-Oct-2020 17:22*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	20-Oct-2020 16:12

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 05-Nov-20

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP50 October 2020 WorkOrder:HS20100342
Sample ID: 50 ww22-201005 Lab ID:HS20100342-03
Collection Date: 05-Oct-2020 09:35 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 14:10
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 14:10
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 14:10
Tetrachloroethene	1.0	U	0.30	1.0	1.0	UG/L	1	09-Oct-2020 14:10
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 14:10
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 14:10
Surr: 1,2-Dichloroethane-d4	*91.8*			**0**	*81-118*	*%REC*	*1*	*09-Oct-2020 14:10*
Surr: 4-Bromofluorobenzene	*107*			**0**	*85-114*	*%REC*	*1*	*09-Oct-2020 14:10*
Surr: Dibromofluoromethane	*94.9*			**0**	*80-119*	*%REC*	*1*	*09-Oct-2020 14:10*
Surr: Toluene-d8	*97.7*			**0**	*89-112*	*%REC*	*1*	*09-Oct-2020 14:10*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	20-Oct-2020 16:12

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 05-Nov-20

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP50 October 2020 WorkOrder:HS20100342
Sample ID: 50 ww23-201005 Lab ID:HS20100342-04
Collection Date: 05-Oct-2020 10:20 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 14:34
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 14:34
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 14:34
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Oct-2020 14:34
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 14:34
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 14:34
Surr: 1,2-Dichloroethane-d4	*91.8*			**0**	*81-118*	*%REC*	*1*	*09-Oct-2020 14:34*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*1*	*09-Oct-2020 14:34*
Surr: Dibromofluoromethane	*94.9*			**0**	*80-119*	*%REC*	*1*	*09-Oct-2020 14:34*
Surr: Toluene-d8	*99.2*			**0**	*89-112*	*%REC*	*1*	*09-Oct-2020 14:34*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	20-Oct-2020 16:12

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 05-Nov-20

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP50 October 2020 WorkOrder:HS20100342
Sample ID: 50 ww15-201005 Lab ID:HS20100342-05
Collection Date: 05-Oct-2020 11:05 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 14:58
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 14:58
cis-1,2-Dichloroethene	**5.4**		**0.20**	**0.50**	**1.0**	**UG/L**	1	09-Oct-2020 14:58
Tetrachloroethene	**1.8**		**0.30**	**1.0**	**1.0**	**UG/L**	1	09-Oct-2020 14:58
Trichloroethene	**8.4**		**0.20**	**0.50**	**1.0**	**UG/L**	1	09-Oct-2020 14:58
Vinyl chloride	**1.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	09-Oct-2020 14:58
Surr: 1,2-Dichloroethane-d4	*91.9*			**0**	*81-118*	*%REC*	*1*	*09-Oct-2020 14:58*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*1*	*09-Oct-2020 14:58*
Surr: Dibromofluoromethane	*94.1*			**0**	*80-119*	*%REC*	*1*	*09-Oct-2020 14:58*
Surr: Toluene-d8	*98.3*			**0**	*89-112*	*%REC*	*1*	*09-Oct-2020 14:58*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	20-Oct-2020 16:12

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 05-Nov-20

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP50 October 2020 WorkOrder:HS20100342
Sample ID: 50 ww16-201005 Lab ID:HS20100342-06
Collection Date: 05-Oct-2020 11:50 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 15:22
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 15:22
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 15:22
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Oct-2020 15:22
Trichloroethene	**0.62**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	09-Oct-2020 15:22
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 15:22
Surr: 1,2-Dichloroethane-d4	*92.3*			**0**	*81-118*	*%REC*	*1*	*09-Oct-2020 15:22*
Surr: 4-Bromofluorobenzene	*107*			**0**	*85-114*	*%REC*	*1*	*09-Oct-2020 15:22*
Surr: Dibromofluoromethane	*95.9*			**0**	*80-119*	*%REC*	*1*	*09-Oct-2020 15:22*
Surr: Toluene-d8	*99.3*			**0**	*89-112*	*%REC*	*1*	*09-Oct-2020 15:22*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	20-Oct-2020 16:12

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 05-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
Sample ID: 50 ww18-201005
Collection Date: 05-Oct-2020 12:45

ANALYTICAL REPORT
WorkOrder:HS20100342
Lab ID:HS20100342-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 15:46
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 15:46
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 15:46
Tetrachloroethene	1.0	U	0.30	1.0	1.0	UG/L	1	09-Oct-2020 15:46
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 15:46
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 15:46
Surr: 1,2-Dichloroethane-d4	*92.3*			**0**	*81-118*	*%REC*	*1*	*09-Oct-2020 15:46*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*1*	*09-Oct-2020 15:46*
Surr: Dibromofluoromethane	*94.4*			**0**	*80-119*	*%REC*	*1*	*09-Oct-2020 15:46*
Surr: Toluene-d8	*98.9*			**0**	*89-112*	*%REC*	*1*	*09-Oct-2020 15:46*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	20-Oct-2020 16:12

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 05-Nov-20

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP50 October 2020 WorkOrder:HS20100342
Sample ID: 50 ww18-201005-FD Lab ID:HS20100342-08
Collection Date: 05-Oct-2020 12:45 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 16:10
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 16:10
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 16:10
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Oct-2020 16:10
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 16:10
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 16:10
Surr: 1,2-Dichloroethane-d4	*90.9*			**0**	*81-118*	*%REC*	*1*	*09-Oct-2020 16:10*
Surr: 4-Bromofluorobenzene	*107*			**0**	*85-114*	*%REC*	*1*	*09-Oct-2020 16:10*
Surr: Dibromofluoromethane	*93.4*			**0**	*80-119*	*%REC*	*1*	*09-Oct-2020 16:10*
Surr: Toluene-d8	*98.2*			**0**	*89-112*	*%REC*	*1*	*09-Oct-2020 16:10*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	20-Oct-2020 16:12

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 05-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
Sample ID: Trip Blank-201005
Collection Date: 05-Oct-2020 00:00

ANALYTICAL REPORT
WorkOrder:HS20100342
Lab ID:HS20100342-09
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 13:22
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 13:22
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 13:22
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Oct-2020 13:22
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 13:22
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	09-Oct-2020 13:22
Surr: 1,2-Dichloroethane-d4	*93.1*			**0**	*81-118*	*%REC*	*1*	*09-Oct-2020 13:22*
Surr: 4-Bromofluorobenzene	*107*			**0**	*85-114*	*%REC*	*1*	*09-Oct-2020 13:22*
Surr: Dibromofluoromethane	*95.2*			**0**	*80-119*	*%REC*	*1*	*09-Oct-2020 13:22*
Surr: Toluene-d8	*98.1*			**0**	*89-112*	*%REC*	*1*	*09-Oct-2020 13:22*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 05-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: HS20100342

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R370245 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS20100342-09	Trip Blank-201005	05 Oct 2020 00:00			09 Oct 2020 13:22	1
Batch ID: R370245 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20100342-01	50 ww09-201005	05 Oct 2020 08:00			09 Oct 2020 13:46	1
HS20100342-02	50 ww08-201005	05 Oct 2020 08:45			09 Oct 2020 21:23	10
HS20100342-02	50 ww08-201005	05 Oct 2020 08:45			09 Oct 2020 17:22	1
HS20100342-03	50 ww22-201005	05 Oct 2020 09:35			09 Oct 2020 14:10	1
HS20100342-04	50 ww23-201005	05 Oct 2020 10:20			09 Oct 2020 14:34	1
HS20100342-05	50 ww15-201005	05 Oct 2020 11:05			09 Oct 2020 14:58	1
HS20100342-06	50 ww16-201005	05 Oct 2020 11:50			09 Oct 2020 15:22	1
HS20100342-07	50 ww18-201005	05 Oct 2020 12:45			09 Oct 2020 15:46	1
HS20100342-08	50 ww18-201005-FD	05 Oct 2020 12:45			09 Oct 2020 16:10	1
Batch ID: R370903 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS20100342-01	50 ww09-201005	05 Oct 2020 08:00			20 Oct 2020 16:12	1
HS20100342-02	50 ww08-201005	05 Oct 2020 08:45			20 Oct 2020 16:12	1
HS20100342-03	50 ww22-201005	05 Oct 2020 09:35			20 Oct 2020 16:12	1
HS20100342-04	50 ww23-201005	05 Oct 2020 10:20			20 Oct 2020 16:12	1
HS20100342-05	50 ww15-201005	05 Oct 2020 11:05			20 Oct 2020 16:12	1
HS20100342-06	50 ww16-201005	05 Oct 2020 11:50			20 Oct 2020 16:12	1
HS20100342-07	50 ww18-201005	05 Oct 2020 12:45			20 Oct 2020 16:12	1
HS20100342-08	50 ww18-201005-FD	05 Oct 2020 12:45			20 Oct 2020 16:12	1

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 05-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: HS20100342

QC BATCH REPORT

Batch ID: R370245 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200109** Units: **UG/L** Analysis Date: **09-Oct-2020 12:58**
Client ID: Run ID: **VOA6_370245** SeqNo: **5775445** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
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
Tetrachloroethene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*45.89*	*1.0*	*50*	*0*	*91.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.54*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*47.29*	*1.0*	*50*	*0*	*94.6*	*80 - 119*				
Surr: Toluene-d8	*49.61*	*1.0*	*50*	*0*	*99.2*	*89 - 112*				

LCS Sample ID: **VLCSW-200109** Units: **UG/L** Analysis Date: **09-Oct-2020 12:10**
Client ID: Run ID: **VOA6_370245** SeqNo: **5775444** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	19.56	1.0	20	0	97.8	71 - 131				
1,2-Dichloroethane	18.74	1.0	20	0	93.7	73 - 128				
cis-1,2-Dichloroethene	19.24	1.0	20	0	96.2	78 - 123				
Tetrachloroethene	18.86	1.0	20	0	94.3	74 - 129				
Trichloroethene	19.14	1.0	20	0	95.7	79 - 123				
Vinyl chloride	18.51	1.0	20	0	92.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.53*	*1.0*	*50*	*0*	*97.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.59*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*48.27*	*1.0*	*50*	*0*	*96.5*	*80 - 119*				
Surr: Toluene-d8	*48.64*	*1.0*	*50*	*0*	*97.3*	*89 - 112*				

ALS Houston, US Date: 05-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: HS20100342

QC BATCH REPORT

Batch ID: R370245 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS20100352-03MS** Units: **UG/L** Analysis Date: **09-Oct-2020 17:46**
Client ID: Run ID: **VOA6_370245** SeqNo: **5775457** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	26.09	1.0	20	0	130	71 - 131				
1,2-Dichloroethane	23.39	1.0	20	0	117	73 - 128				
cis-1,2-Dichloroethene	24.27	1.0	20	0	121	78 - 123				
Tetrachloroethene	24.94	1.0	20	0	125	74 - 129				
Trichloroethene	32.59	1.0	20	7.341	126	79 - 123				S
Vinyl chloride	23.24	1.0	20	0	116	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.17*	*1.0*	*50*	*0*	*92.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.57*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*47.6*	*1.0*	*50*	*0*	*95.2*	*80 - 119*				
Surr: Toluene-d8	*48.46*	*1.0*	*50*	*0*	*96.9*	*89 - 112*				

MSD Sample ID: **HS20100352-03MSD** Units: **UG/L** Analysis Date: **09-Oct-2020 18:10**
Client ID: Run ID: **VOA6_370245** SeqNo: **5775458** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	25.39	1.0	20	0	127	71 - 131	26.09	2.73	20	
1,2-Dichloroethane	23	1.0	20	0	115	73 - 128	23.39	1.66	20	
cis-1,2-Dichloroethene	23.77	1.0	20	0	119	78 - 123	24.27	2.08	20	
Tetrachloroethene	24.24	1.0	20	0	121	74 - 129	24.94	2.82	20	
Trichloroethene	31.35	1.0	20	7.341	120	79 - 123	32.59	3.87	20	
Vinyl chloride	22.26	1.0	20	0	111	58 - 137	23.24	4.33	20	
Surr: 1,2-Dichloroethane-d4	*46.18*	*1.0*	*50*	*0*	*92.4*	*81 - 118*	*46.17*	*0.0107*	*20*	
Surr: 4-Bromofluorobenzene	*52.64*	*1.0*	*50*	*0*	*105*	*85 - 114*	*52.57*	*0.137*	*20*	
Surr: Dibromofluoromethane	*47.54*	*1.0*	*50*	*0*	*95.1*	*80 - 119*	*47.6*	*0.107*	*20*	
Surr: Toluene-d8	*48*	*1.0*	*50*	*0*	*96.0*	*89 - 112*	*48.46*	*0.956*	*20*	

The following samples were analyzed in this batch:

HS20100342-01	HS20100342-02	HS20100342-03	HS20100342-04
HS20100342-05	HS20100342-06	HS20100342-07	HS20100342-08
HS20100342-09			

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 05-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: **HS20100342**

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

RIGHT SOLUTIONS | RIGHT PARTNER

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	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	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2020-2021	30-Apr-2021
Texas	T104704231-20-26	30-Apr-2021

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 05-Nov-20

Sample Receipt Checklist

Work Order ID: HS20100342 **Date/Time Received:** **06-Oct-2020 14:30**

Client Name: CBI-Houston **Received by:** **Jared R. Makan**

Completed By:	/S/ Nilesh D. Ranchod	08-Oct-2020 12:00	**Reviewed by:**	/S/ RJ Modashia	08-Oct-2020 19:56
	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):	1.5C UC/C	IR # 31
Cooler(s)/Kit(s):	45424	
Date/Time sample(s) sent to storage:	10/07/2020 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: Sample Label times differ 50ww16-201005 COC= 11:50 Labels Vials 2of 3 and 3of 3 11:05

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

RIGHT SOLUTIONS | RIGHT PARTNER

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: LHAAP50 October 2020

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 (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW6850	Remarks (Preservatives, etc.)	Lab I.D.#
SDww09-201005	WG	10/5/20/0800		4	X					X		
SDww08-201005	WG	10/5/20/0845		4	X					X		
SDww22-201005	WG	10/5/20/0935		4	X					X		
SDww23-201005	WG	10/5/20/1020		4	X					X		
SDww15-201005	WG	10/5/20/1105		4	X					X		
SDww16-201005	WG	10/5/20/1150		4	X					X		
SDww18-201005	WG	10/5/20/1245		4	X					X		
SDww18-20105-FD	WG	105/20/1245		4	X					X		

HS20100342
Aptim Environmental & Infrastucture, Inc.
LHAAP50 October 2020

Additional Remarks: **Standard TAT on all parameters. Please email results to Susan.Huang@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	10/6/20	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Inserra	10/7/20	09:20							

Remarks: Cooler 45424 Temp 1.5°C IR31 4PO

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

RIGHT SOLUTIONS | RIGHT PARTNER

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: **LHAAP50 October 2020**

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 (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW6850	Remarks (Preservatives, etc.)	Lab I.D.#
TRIPBLANK-201005	GW	10/5/20		2	X							

HS20100342
Aptim Environmental & Infrastucture, Inc.
LHAAP50 October 2020

Additional Remarks: **Standard TAT on all parameters. Please email results to Susan.Huang@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	10/6/20	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Mercer	10/7/20	09:20							

Remarks:

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

RIGHT SOLUTIONS | RIGHT PARTNER

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

45424

CUSTODY SEAL

Date: 10/6/20 Time: 1430
Name: Scott Beesinger
Comp any: BAATZ

Seal Broken By:
Date: 10/07/20

45424 OCT 0 7 2020

Must Deliver Next Business Day
Time and Tempature Sensitive!

45424

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM
1203-B EAST GRAND AVE.
PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 21SEP20
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-50-BO 73885-RJ

RMA:

FedEx Express

FedEx
TRK# 0221 1891 8880 4944

WED - 07 OCT 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

#475872 10/06 56BJ2/A27E/B766

RIGHT SOLUTIONS | RIGHT PARTNER

November 5, 2020 Service Request No:E2000964

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: HS20100342

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 09, 2020
For your reference, these analyses have been assigned our service request number **E2000964.**

Revision I - This report was revised to correct sample ID E2000964-008 to reflex the chain of custody (50WW18-201005-FD).

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

RIGHT SOLUTIONS | RIGHT PARTNER

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2000964
Project:	HS20100342	**Date Received:**	10/09/20
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 IV. 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 10/09/20.

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:

EQ2000497: 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 and DLCS recoveries are within QC limits.

Detection Limits

Lowest practical dilution performed on samples E2000964-001/003/004/005/007/008 due to sample matrix.

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

RIGHT SOLUTIONS | RIGHT PARTNER

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.

RIGHT SOLUTIONS | RIGHT PARTNER

Client: ALS Environmental - US
Project: HS20100342

Service Request:E2000964

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2000964-001	50WW09-201005	10/5/2020	0800
E2000964-002	50WW08-201005	10/5/2020	0845
E2000964-003	50WW22-201005	10/5/2020	0935
E2000964-004	50WW23-201005	10/5/2020	1020
E2000964-005	50WW15-201005	10/5/2020	1105
E2000964-006	50WW16-201005	10/5/2020	1150
E2000964-007	50WW18-201005	10/5/2020	1150
E2000964-008	50WW18-201005-FD	10/5/2020	1245

RIGHT SOLUTIONS | RIGHT PARTNER

Service Request Summary

Folder #: **E2000964**
Client Name: ALS Environmental - US
Project Name: HS20100342
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: 10/09/20
Internal Due Date: 10/20/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20100342
EDD: No EDD Specified

8 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 2D
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2000964-001	50WW09-201005	Ground Water	10/05/20 0800	**IV**
E2000964-002	50WW08-201005	Ground Water	10/05/20 0845	**IV**
E2000964-003	50WW22-201005	Ground Water	10/05/20 0935	**IV**
E2000964-004	50WW23-201005	Ground Water	10/05/20 1020	**IV**
E2000964-005	50WW15-201005	Ground Water	10/05/20 1105	**IV**
E2000964-006	50WW16-201005	Ground Water	10/05/20 1150	**IV**
E2000964-007	50WW18-201005	Ground Water	10/05/20 1150	**IV**
E2000964-008	50WW18-201005-FD	Ground Water	10/05/20 1245	**IV**

RIGHT SOLUTIONS | RIGHT PARTNER

Service Request Summary

Folder #: **E2000964**
Client Name: ALS Environmental - US
Project Name: HS20100342
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: 10/09/20
Internal Due Date: 10/20/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20100342
EDD: No EDD Specified

8 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 2D
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	8	Level II due 10/20,level IV 10/27

RIGHT SOLUTIONS | RIGHT PARTNER

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.
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.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

RIGHT SOLUTIONS | RIGHT PARTNER

Data Qualifiers

Lab 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.

RIGHT SOLUTIONS | RIGHT PARTNER

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

RIGHT SOLUTIONS | RIGHT PARTNER

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	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
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	LA028-2020	12/31/2020
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Minnesota Department of Health	1785988	12/31/2020
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
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	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022
Washington Department of Health	C819	11/14/2020

RIGHT SOLUTIONS | RIGHT PARTNER

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

RIGHT SOLUTIONS | RIGHT PARTNER

RIGHT SOLUTIONS | RIGHT PARTNER

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:** **14880**

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:	HS20100342
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20100342-01**	**50 ww09-201005**	**Groundwater**	**05 Oct 2020 08:00**
	SUB_Perch-6850			16 Oct 2020
2.	**HS20100342-02**	**50 ww08-201005**	**Groundwater**	**05 Oct 2020 08:45**
	SUB_Perch-6850			16 Oct 2020
3.	**HS20100342-03**	**50 ww22-201005**	**Groundwater**	**05 Oct 2020 09:35**
	SUB_Perch-6850			16 Oct 2020
4.	**HS20100342-04**	**50 ww23-201005**	**Groundwater**	**05 Oct 2020 10:20**
	SUB_Perch-6850			16 Oct 2020
5.	**HS20100342-05**	**50 ww15-201005**	**Groundwater**	**05 Oct 2020 11:05**
	SUB_Perch-6850			16 Oct 2020
6.	**HS20100342-06**	**50 ww16-201005**	**Groundwater**	**05 Oct 2020 11:50**
	SUB_Perch-6850			16 Oct 2020
7.	**HS20100342-07**	**50 ww18-201005**	**Groundwater**	**05 Oct 2020 12:45**
	SUB_Perch-6850			16 Oct 2020
8.	**HS20100342-08**	**50 ww1-201005-FD**	**Groundwater**	**05 Oct 2020 12:45**
	SUB_Perch-6850			16 Oct 2020

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **14880**

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By:	J. Mayerson	Date/Time:	
Received By:	[illegible]	Date/Time:	10/19/20 0900
Cooler ID(s):		Temperature(s):	

ALS Environmental

Cooler Receipt Form

Project Chemist CH

Client/Project ALS-H

Thermometer ID 1231

Date/Time Received: 10/4/20 Initials: CH

Date/Time Logged in: 10/4/20 Initials CH

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?
-		10/4/20	0800	CH	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

RIGHT SOLUTIONS | RIGHT PARTNER

01078329

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#: 367345 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/KBROWN **Prep Method:** Method **Prep Date/Time:** 10/9/20 11:34

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2000943-001	50WW29-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2000943-002	50WW05-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2000944-001	50WW14-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2000944-002	50WW13-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2000944-003	50WW11-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2000944-004	50WW11-201001-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2000944-005	50WW06-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2000944-006	50WW12-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2000949-001	LH18/24-SP650_100620-AIX	.01	6850/ClO4 DOD			Water	10mL	
10	E2000949-002	LH18/24-SP650_100620-BIX	.01	6850/ClO4 DOD			Water	10mL	
11	E2000964-001	50WW09-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2000964-002	50WW08-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2000964-003	50WW22-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2000964-004	50WW23-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2000964-005	50WW15-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2000964-006	50WW16-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
17	E2000964-007	50WW18-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
18	E2000964-008	50WW18-201005-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
19	EQ2000497-01	MB		6850/ClO4 DOD			Liquid	10mL	
20	EQ2000497-02	LCS		6850/ClO4 DOD			Liquid	10mL	
21	EQ2000497-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
22	EQ2000497-04	50WW14-201001 MS	.02	6850/ClO4 DOD			Liquid	10mL	
23	EQ2000497-05	50WW14-201001 DMS	.03	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 209764 Logbook Ref: Perchlorate Int. Stock1 51820 Expires On: 11/18/2020

EQ2000497-02	1.00µL	EQ2000497-03	1.00µL	EQ2000497-04	1.00µL	EQ2000497-05	1.00µL

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 212340 Logbook Ref: Sodium Perchlorate Expires On: 07/13/2022

E2000943-001	100.00µL	E2000943-002	100.00µL	E2000944-001	100.00µL	E2000944-002	100.00µL	E2000944-003	100.00µL	E2000944-004	100.00µL
E2000944-005	100.00µL	E2000944-006	100.00µL	E2000949-001	100.00µL	E2000949-002	100.00µL	E2000964-001	100.00µL	E2000964-002	100.00µL
E2000964-003	100.00µL	E2000964-004	100.00µL	E2000964-005	100.00µL	E2000964-006	100.00µL	E2000964-007	100.00µL	E2000964-008	100.00µL
EQ2000497-01	100.00µL	EQ2000497-02	100.00µL	EQ2000497-03	100.00µL	EQ2000497-04	100.00µL	EQ2000497-05	100.00µL		

RIGHT SOLUTIONS | RIGHT PARTNER

Preparation Information Benchsheet

Prep Run#: 367345
Team: Semivoa GCMS/KBROWN
Prep WorkFlow: GenExt28Day
Prep Method: Method
Status: Prepped
Prep Date/Time: 10/9/20 11:34

Preparation Steps

Step: Preparation
Started: 10/9/20 11:34
Finished: 10/9/20 13:30
By: KBROWN
Comments

Comments: _____

Reviewed By: KB Date: 10/09/2020

Chain of Custody

Relinquished By: _____ Date: _____

Received By: _____ Date: _____

Extracts Examined
Yes No

RIGHT SOLUTIONS | RIGHT PARTNER

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:**	E2000964
Project:	HS20100342	**Date Collected:**	10/ 5/20 0800
Sample Matrix:	Ground Water	**Date Received:**	10/ 9/20
Sample Name:	50WW09-201005	**Units:**	µg/L
Lab Code:	E2000964-001	**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	1.00	0.500	0.250	10	10/ 9/20	10/19/20 15:16	367345	699988	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Collected:**	10/ 5/20 0845
Sample Matrix:	Ground Water	**Date Received:**	10/ 9/20
Sample Name:	50WW08-201005	**Units:**	µg/L
Lab Code:	E2000964-002	**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	**172**		1.00	0.500	0.250	10	10/ 9/20	10/19/20 15:16	367345	699988	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Collected:**	10/ 5/20 0935
Sample Matrix:	Ground Water	**Date Received:**	10/ 9/20
Sample Name:	50WW22-201005	**Units:**	µg/L
Lab Code:	E2000964-003	**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	1.00	0.500	0.250	10	10/ 9/20	10/19/20 15:16	367345	699988	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Collected:**	10/ 5/20 1020
Sample Matrix:	Ground Water	**Date Received:**	10/ 9/20
Sample Name:	50WW23-201005	**Units:**	µg/L
Lab Code:	E2000964-004	**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	10/ 9/20	10/19/20 15:50	367345	699988	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Collected:**	10/ 5/20 1105
Sample Matrix:	Ground Water	**Date Received:**	10/ 9/20
Sample Name:	50WW15-201005	**Units:**	µg/L
Lab Code:	E2000964-005	**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	10/ 9/20	10/19/20 15:58	367345	699988	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Collected:**	10/ 5/20 1150
Sample Matrix:	Ground Water	**Date Received:**	10/ 9/20
Sample Name:	50WW16-201005	**Units:**	µg/L
Lab Code:	E2000964-006	**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	**0.0701**	J	0.100	0.0500	0.0250	1	10/ 9/20	10/19/20 16:06	367345	699988	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Collected:**	10/ 5/20 1150
Sample Matrix:	Ground Water	**Date Received:**	10/ 9/20
Sample Name:	50WW18-201005	**Units:**	µg/L
Lab Code:	E2000964-007	**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	10/ 9/20	10/19/20 16:42	367345	699988	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Collected:**	10/ 5/20 1245
Sample Matrix:	Ground Water	**Date Received:**	10/ 9/20
Sample Name:	50WW18-201005-FD	**Units:**	µg/L
Lab Code:	E2000964-008	**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	1.00	0.500	0.250	10	10/ 9/20	10/19/20 16:50	367345	699988	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2000497-01	**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	10/ 9/20	10/9/20 15:24	367345	698929	

RIGHT SOLUTIONS | RIGHT PARTNER

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:**	E2000964
Project:	HS20100342	**Date Analyzed:**	10/ 9/20
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:**	NA
		Extraction Lot:	367345

	Lab Control Sample EQ2000497-02			Duplicate Lab Control Sample EQ2000497-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0996	0.100	100	0.111	0.100	111	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.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000497-02	**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	**0.0996**	J	0.100	0.0500	0.0250	1	10/ 9/20	10/9/20 15:32	367345	698929	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000497-03	**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	**0.111**		0.100	0.0500	0.0250	1	10/ 9/20	10/9/20 15:40	367345	698929	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
		Date Analyzed:	10/16/20

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	E2000944-001	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		Batch QCMS				Batch QCDMS					
		Matrix Spike				**Duplicate Matrix Spike**					
		EQ2000497-04				EQ2000497-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	1.37	1.46	0.100	94	1.47	0.100	101	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.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	EQ2000497-04	**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	**1.46**		1.00	0.500	0.250	10	10/ 9/20	10/16/20 12:25	367345	699559	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	EQ2000497-05	**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	**1.47**		1.00	0.500	0.250	10	10/ 9/20	10/16/20 12:09	367345	699559	

RIGHT SOLUTIONS | RIGHT PARTNER

Initial Calibration

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

RIGHT SOLUTIONS | RIGHT PARTNER

20200915

1st Review: Grivera
2nd Review: Hvan

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 9/15/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000032**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	PERCHLORATE1		20200915_044	Perchlorate6850b.lcm	1x	☒	3100806-05	9/15/2020 17:55
2	PERCHLORATE2		20200915_024	Perchlorate6850b.lcm	1x	☒	3100806-06	9/15/2020 15:10
3	PERCHLORATE3		20200915_046	Perchlorate6850b.lcm	1x	☒	3100806-07	9/15/2020 18:13
4	PERCHLORATE4		20200915_047	Perchlorate6850b.lcm	1x	☒	3100807-01	9/15/2020 18:21
5	PERCHLORATE5		20200915_048	Perchlorate6850b.lcm	1x	☒	3100807-02	9/15/2020 18:29
6	PERCHLORATE6		20200915_049	Perchlorate6850b.lcm	1x	☒	3100807-03	9/15/2020 18:37
7	PERCHLORATE7		20200915_029	Perchlorate6850b.lcm	1x	☒	3100807-04	9/15/2020 15:49
8	PERCHLORATE8		20200915_051	Perchlorate6850b.lcm	1x	☒	3100807-05	9/15/2020 18:52
9	PERCHLORATE9		20200915_052	Perchlorate6850b.lcm	1x	☒	3100807-06	9/15/2020 19:00
10	PERCHLORATE10		20200915_053	Perchlorate6850b.lcm	1x	☒	3100807-07	9/15/2020 19:08
11	PERCHLORATE ICV		20200915_054	Perchlorate6850b.lcm	1x	☒	3100807-08	9/15/2020 19:16
12	LODV		20200915_055	Perchlorate6850b.lcm	1x	☒		9/15/2020 19:24
13	E2000817-001		20200915_056	Perchlorate6850b.lcm	1x	☒		9/15/2020 19:40
14	E2000817-001x10		20200915_057	Perchlorate6850b.lcm	1x	☒		9/15/2020 19:48
15	PERCHLORATE7		20200915_058	Perchlorate6850b.lcm	1x	☒	3100807-04	9/15/2020 19:56
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								

RIGHT SOLUTIONS | RIGHT PARTNER

Initial Calibration - Detailed Report

Calibration ID: EC2000032 **Instrument ID:** E-LCMS-01
Column Name: 1

#	Lab Code	Sample Name	File Location	Aquisition Date
01	EC2000032-01	PERCHLORATE2	20200915_024	09/15/2020 15:10
02	EC2000032-02	PERCHLORATE7	20200915_029	09/15/2020 15:49
03	EC2000032-03	PERCHLORATE1	20200915_044	09/15/2020 17:55
04	EC2000032-04	PERCHLORATE3	20200915_046	09/15/2020 18:13
05	EC2000032-05	PERCHLORATE4	20200915_047	09/15/2020 18:21
06	EC2000032-06	PERCHLORATE5	20200915_048	09/15/2020 18:29
07	EC2000032-07	PERCHLORATE6	20200915_049	09/15/2020 18:37
08	EC2000032-08	PERCHLORATE8	20200915_051	09/15/2020 18:52
09	EC2000032-09	PERCHLORATE9	20200915_052	09/15/2020 19:00
10	EC2000032-10	PERCHLORATE10	20200915_053	09/15/2020 19:08

Analyte	Curve Fit	Weighting		
Perchlorate	**Quadratic**	**Equal**	**COD = 0.9998**	**Y= -9.474E-05 X² + 0.1066 X + 0.00148**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5000	0.1319	02	10.0000	0.1001	03	0.1000	0.1399	04	0.7000	0.1079
05	1.0000	0.1089	06	2.0000	0.1096	07	5.0000	0.1086	08	20.0000	0.1062
09	30.0000	0.104	10	50.0000	0.1018						

Analyte

Perchlorate

#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D
01	0.5000	0.605	21.0	02	10.0000	9.45	-5.5	03	0.1000	0.117	17.3
04	0.7000	0.695	-0.8	05	1.0000	1.01	0.8	06	2.0000	2.05	2.3
07	5.0000	5.10	2.0	08	20.0000	20.3	1.3	09	30.0000	30.1	0.2
10	50.0000	50.0	-0.1								

RIGHT SOLUTIONS | RIGHT PARTNER

Initial Calibration Verification Summary Report

Calibration ID:	EC2000032	**Instrument ID:**	E-LCMS-01
Datafile ID:	20200915_054	**Column Name:**	1

Analyte	Lab Code	Type	Curve Fit	True Value	Calc Conc	Units	Result	Criteria
Perchlorate	EC2000032-11	T	Quadratic	10	9.462	ng/mL	-5.4	<= 15

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

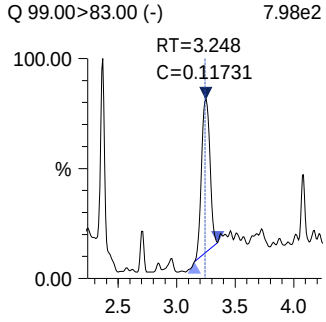
PERCHLORATE1

Date acquired: 9/15/2020 5:55:29 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_044.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE1	9/15/2020 5:55:29 PM	2833	0.11731	20200915_044	3.248	25.0000	1.0000	5
Sodium Perchlorate-18O4_IS	PERCHLORATE1	9/15/2020 5:55:29 PM	202512	1.00000	20200915_044	3.237	25.0000	1.0000	5

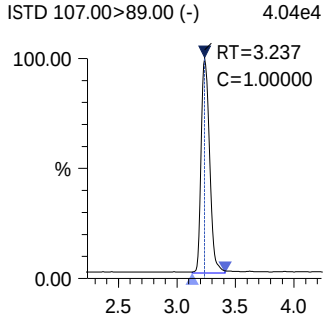
Perchlorate

Conc 0.11731
Area 2833



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 202512



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

PERCHLORATE2

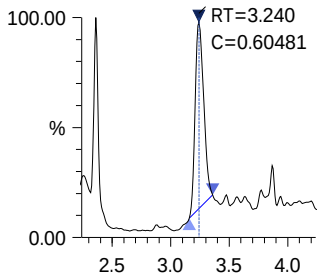
Date acquired: 9/15/2020 3:10:04 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_024.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE2	9/15/2020 3:10:04 PM	11634	0.60481	20200915_024	3.240	25.0000	1.0000	6
Sodium Perchlorate-18O4_IS	PERCHLORATE2	9/15/2020 3:10:04 PM	176422	1.00000	20200915_024	3.240	25.0000	1.0000	6

Perchlorate

Conc 0.60481
Area 11634

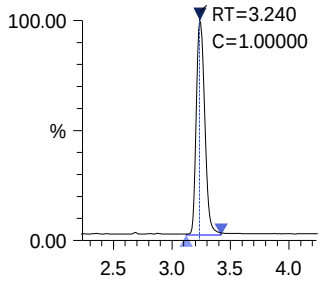
Q 99.00>83.00 (-) 2.66e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 176422

ISTD 107.00>89.00 (-) 3.50e4



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

PERCHLORATE3

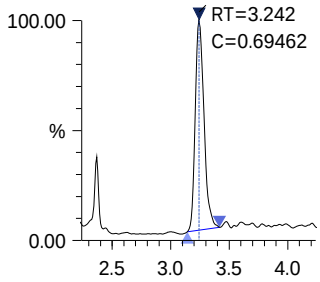
Date acquired: 9/15/2020 6:13:20 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_046.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE3	9/15/2020 6:13:20 PM	14722	0.69462	20200915_046	3.242	25.0000	1.0000	7
Sodium Perchlorate-18O4_IS	PERCHLORATE3	9/15/2020 6:13:20 PM	194971	1.00000	20200915_046	3.239	25.0000	1.0000	7

Perchlorate

Conc 0.69462
Area 14722

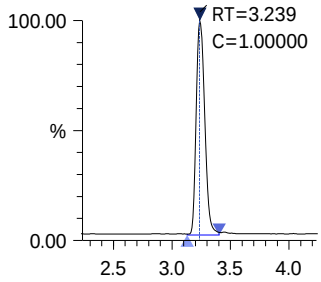
Q 99.00>83.00 (-) 2.91e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 194971

ISTD 107.00>89.00 (-) 3.85e4



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

PERCHLORATE4

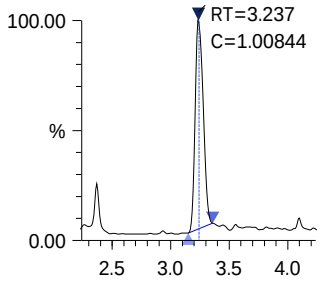
Date acquired: 9/15/2020 6:21:15 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_047.lcd
Vial: 8 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE4	9/15/2020 6:21:15 PM	19524	1.00844	20200915_047	3.237	25.0000	1.0000	8
Sodium Perchlorate-18O4_IS	PERCHLORATE4	9/15/2020 6:21:15 PM	179246	1.00000	20200915_047	3.240	25.0000	1.0000	8

Perchlorate

Conc 1.00844
Area 19524

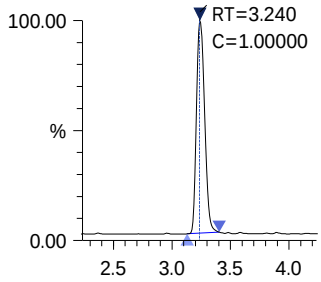
Q 99.00>83.00 (-) 4.23e3



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 179246

ISTD 107.00>89.00 (-) 3.75e4



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

PERCHLORATE5

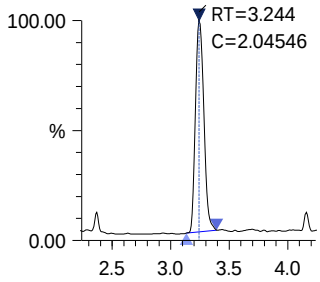
Date acquired: 9/15/2020 6:29:08 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_048.lcd
Vial: 9 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE5	9/15/2020 6:29:08 PM	38522	2.04546	20200915_048	3.244	25.0000	1.0000	9
Sodium Perchlorate-18O4_IS	PERCHLORATE5	9/15/2020 6:29:08 PM	175734	1.00000	20200915_048	3.240	25.0000	1.0000	9

Perchlorate

Conc 2.04546
Area 38522

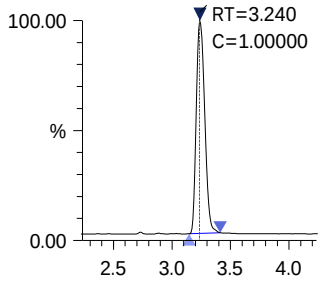
Q 99.00>83.00 (-) 7.92e3



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 175734

ISTD 107.00>89.00 (-) 3.56e4



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

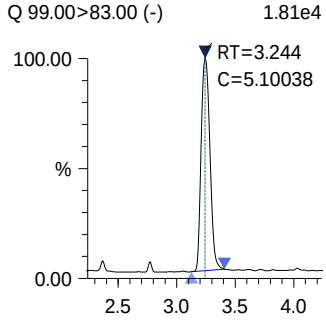
PERCHLORATE6

Date acquired: 9/15/2020 6:37:05 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_049.lcd
Vial: 10 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE6	9/15/2020 6:37:05 PM	92162	5.10038	20200915_049	3.244	25.0000	1.0000	10
Sodium Perchlorate-18O4_IS	PERCHLORATE6	9/15/2020 6:37:05 PM	169754	1.00000	20200915_049	3.239	25.0000	1.0000	10

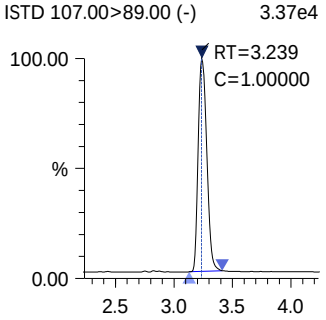
Perchlorate

Conc 5.10038
Area 92162



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 169754



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

PERCHLORATE7

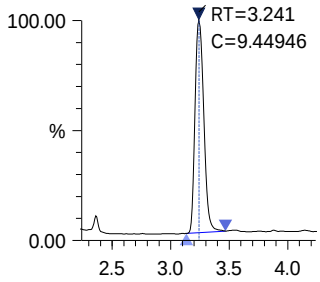
Date acquired: 9/15/2020 3:49:35 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_029.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	9/15/2020 3:49:35 PM	144012	9.44946	20200915_029	3.241	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	9/15/2020 3:49:35 PM	143911	1.00000	20200915_029	3.238	25.0000	1.0000	4

Perchlorate

Conc 9.44946
Area 144012

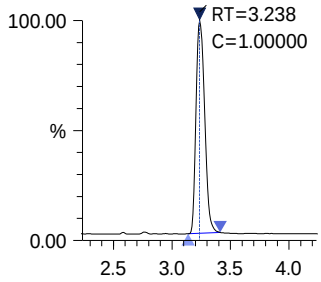
Q 99.00>83.00 (-) 2.81e4



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 143911

ISTD 107.00>89.00 (-) 2.84e4



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

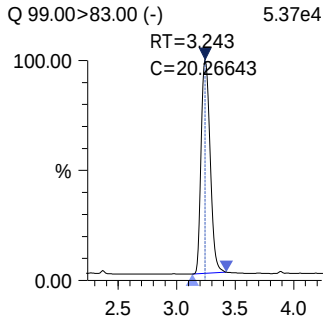
PERCHLORATE8

Date acquired: 9/15/2020 6:52:54 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_051.lcd
Vial: 11 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE8	9/15/2020 6:52:54 PM	284308	20.26643	20200915_051	3.243	25.0000	1.0000	11
Sodium Perchlorate-18O4_IS	PERCHLORATE8	9/15/2020 6:52:54 PM	133870	1.00000	20200915_051	3.240	25.0000	1.0000	11

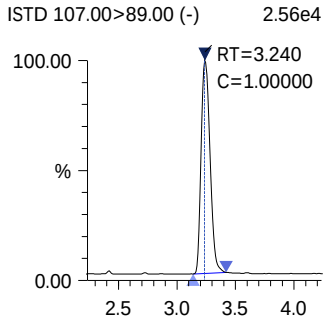
Perchlorate

Conc 20.26643
Area 284308



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 133870



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

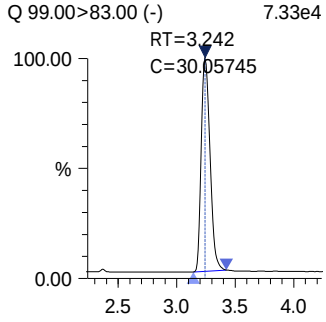
PERCHLORATE9

Date acquired: 9/15/2020 7:00:50 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_052.lcd
Vial: 12 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE9	9/15/2020 7:00:50 PM	377183	30.05745	20200915_052	3.242	25.0000	1.0000	12
Sodium Perchlorate-18O4_IS	PERCHLORATE9	9/15/2020 7:00:50 PM	120846	1.00000	20200915_052	3.240	25.0000	1.0000	12

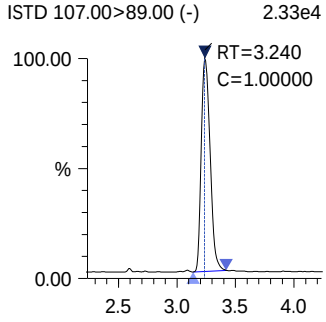
Perchlorate

Conc 30.05745
Area 377183



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 120846



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

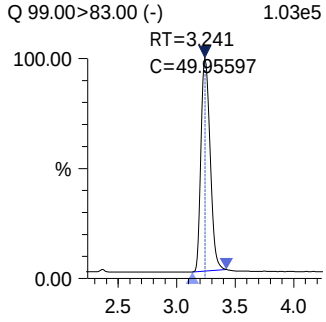
PERCHLORATE10

Date acquired: 9/15/2020 7:08:43 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_053.lcd
Vial: 13 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE10	9/15/2020 7:08:43 PM	553330	49.95597	20200915_053	3.241	25.0000	1.0000	13
Sodium Perchlorate-18O4_IS	PERCHLORATE10	9/15/2020 7:08:43 PM	108660	1.00000	20200915_053	3.240	25.0000	1.0000	13

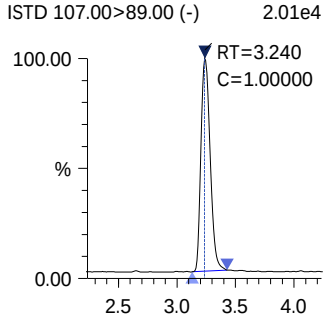
Perchlorate

Conc 49.95597
Area 553330



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 108660



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

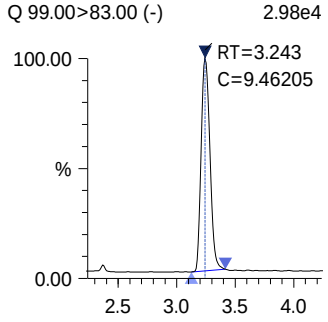
PERCHLORATEICV

Date acquired: 9/15/2020 7:16:39 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_054.lcd
Vial: 14 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATEICV	9/15/2020 7:16:39 PM	152650	9.46205	20200915_054	3.243	25.0000	1.0000	14
Sodium Perchlorate-18O4_IS	PERCHLORATEICV	9/15/2020 7:16:39 PM	152342	1.00000	20200915_054	3.241	25.0000	1.0000	14

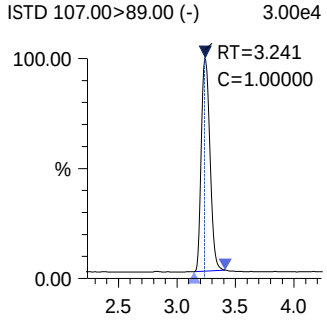
Perchlorate

Conc 9.46205
Area 152650



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 152342



RIGHT SOLUTIONS | RIGHT PARTNER

Chromatograms and Selected Ion Monitoring

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 320, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

RIGHT SOLUTIONS | RIGHT PARTNER

20201009

ALS Environmental

ICAL Date: 9/15/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000032**

1st Review: Grivera
2nd Review: Kneir

Injection Log
LCMS01 -Shimadzu 8050

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	null		20201009_001	Perchlorate6850b.lcm	1x	☒		10/9/2020 13:57
2	null		20201009_002	Perchlorate6850b.lcm	1x	☒		10/9/2020 14:02
3	IB		20201009_003	Perchlorate6850b.lcm	1x	☒		10/9/2020 14:52
4	LODV		20201009_004	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:00
5	PERCHLORATE7		20201009_005	Perchlorate6850b.lcm	1x	☒	3100807-04	10/9/2020 15:08
6	ICS		20201009_006	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:16
7	EQ2000497-01		20201009_007	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:24
8	EQ2000497-02		20201009_008	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:32
9	EQ2000497-03		20201009_009	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:40
10	EQ2000497-04		20201009_010	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:48
11	EQ2000497-05		20201009_011	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:55
12	E2000943-001		20201009_012	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:03
13	E2000943-002		20201009_013	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:11
14	E2000944-001		20201009_014	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:19
15	E2000944-002		20201009_015	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:27
16	E2000944-003		20201009_016	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:35
17	PERCHLORATE7		20201009_017	Perchlorate6850b.lcm	1x	☒	3100807-04	10/9/2020 16:43
18	E2000944-004		20201009_018	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:51
19	E2000944-005		20201009_019	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:58
20	E2000944-006		20201009_020	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:06
21	E2000949-001		20201009_021	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:14
22	E2000949-002		20201009_022	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:22
23	E2000964-001		20201009_023	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:30
24	E2000964-002		20201009_024	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:38
25	E2000964-003		20201009_025	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:46
26	E2000964-004		20201009_026	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:54
27	E2000964-005		20201009_027	Perchlorate6850b.lcm	1x	☒		10/9/2020 18:02
28	PERCHLORATE7		20201009_028	Perchlorate6850b.lcm	1x	☒	3100807-04	10/9/2020 18:10
29	E2000964-006		20201009_029	Perchlorate6850b.lcm	1x	☒		10/9/2020 18:17
30	E2000964-007		20201009_030	Perchlorate6850b.lcm	1x	☒		10/9/2020 18:25
31	E2000964-008		20201009_031	Perchlorate6850b.lcm	1x	☒		10/9/2020 18:33
32	PERCHLORATE7		20201009_032	Perchlorate6850b.lcm	1x	☒	3100807-04	10/9/2020 18:41
33								
34								
35								
36								
37								
38								
39								

RIGHT SOLUTIONS | RIGHT PARTNER

20201016

ALS Environmental

ICAL Date: 9/15/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000032**

1st Review: Grivera
2nd Review: Kneir

Injection Log
LCMS01 -Shimadzu 8050

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	null		20201016_001	Perchlorate6850b.lcm	1x	☒		10/16/2020 8:39
2	null		20201016_002	Perchlorate6850b.lcm	1x	☒		10/16/2020 8:44
3	IB		20201016_003	Perchlorate6850b.lcm	1x	☒		10/16/2020 8:49
4	IB		20201016_004	Perchlorate6850b.lcm	1x	☒		10/16/2020 8:57
5	LODV		20201016_005	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:05
6	ICS		20201016_006	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:13
7	PERCHLORATE7		20201016_007	Perchlorate6850b.lcm	1x	☒	3100807-04	10/16/2020 9:21
8	E2000943-001		20201016_008	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:33
9	E2000943-002		20201016_009	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:41
10	E2000944-001		20201016_010	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:49
11	E2000944-002		20201016_011	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:57
12	E2000944-003		20201016_012	Perchlorate6850b.lcm	1x	☒		10/16/2020 10:04
13	E2000944-004		20201016_013	Perchlorate6850b.lcm	1x	☒		10/16/2020 10:12
14	E2000944-005		20201016_014	Perchlorate6850b.lcm	1x	☒		10/16/2020 10:20
15	E2000944-006		20201016_015	Perchlorate6850b.lcm	1x	☒		10/16/2020 10:28
16	PERCHLORATE7		20201016_018	Perchlorate6850b.lcm	1x	☒	3100807-04	10/16/2020 10:52
17	E2000943-001X2		20201016_019	Perchlorate6850b.lcm	2x	☒		10/16/2020 11:06
18	E2000944-001X10		20201016_020	Perchlorate6850b.lcm	10x	☒		10/16/2020 11:14
19	E2000944-002X200		20201016_021	Perchlorate6850b.lcm	200x	☒		10/16/2020 11:22
20	E2000944-003X200		20201016_022	Perchlorate6850b.lcm	200x	☒		10/16/2020 11:30
21	E2000944-004X200		20201016_023	Perchlorate6850b.lcm	200x	☒		10/16/2020 11:38
22	E2000944-005X100		20201016_024	Perchlorate6850b.lcm	100x	☒		10/16/2020 11:46
23	E2000944-006X1000		20201016_025	Perchlorate6850b.lcm	1000x	☒		10/16/2020 11:54
24	EQ2000497-05		20201016_027	Perchlorate6850b.lcm	10x	☒		10/16/2020 12:09
25	PERCHLORATE7		20201016_028	Perchlorate6850b.lcm	1x	☒	3100807-04	10/16/2020 12:17
26	EQ2000497-04		20201016_029	Perchlorate6850b.lcm	10x	☒		10/16/2020 12:25
27	PERCHLORATE7		20201016_030	Perchlorate6850b.lcm	1x	☒	3100807-04	10/16/2020 12:36
28	EQ2000507-01		20201016_031	Perchlorate6850b.lcm	1x	☒		10/16/2020 12:44
29	EQ2000507-02		20201016_032	Perchlorate6850b.lcm	1x	☒		10/16/2020 12:52
30	EQ2000507-03		20201016_033	Perchlorate6850b.lcm	1x	☒		10/16/2020 12:59
31	E2000942-001		20201016_034	Perchlorate6850b.lcm	1x	☒		10/16/2020 13:07
32	E2000942-002		20201016_035	Perchlorate6850b.lcm	1x	☒		10/16/2020 13:15
33	E2000942-003		20201016_036	Perchlorate6850b.lcm	1x	☒		10/16/2020 13:23
34	E2000942-004		20201016_037	Perchlorate6850b.lcm	1x	☒		10/16/2020 13:31
35	E2000942-003X2		20201016_038	Perchlorate6850b.lcm	2X	☒		10/16/2020 13:39
36	E2000942-004X2		20201016_039	Perchlorate6850b.lcm	2X	☒		10/16/2020 13:47
37	PERCHLORATE7		20201016_040	Perchlorate6850b.lcm	1x	☒	3100807-04	10/16/2020 13:55
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Analyzed:**	10/16/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	9/15/20
File ID:	I:\LCMS01\DATA\20201016\20201016_007	**Calibration ID:**	EC2000032
		Analysis Lot:	699559
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.82	NA	NA	NA	-1.8	± 15 %	Quadratic

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Analyzed:**	10/16/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	9/15/20
File ID:	I:\LCMS01\DATA\20201016\20201016_018	**Calibration ID:**	EC2000032
		Analysis Lot:	699559
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.4	NA	NA	NA	4.3	± 15 %	Quadratic

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Analyzed:**	10/16/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	9/15/20
File ID:	I:\LCMS01\DATA\20201016\20201016_028	**Calibration ID:**	EC2000032
		Analysis Lot:	699559
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.2	NA	NA	NA	1.8	± 15 %	Quadratic

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Analyzed:**	10/16/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	9/15/20
File ID:	I:\LCMS01\DATA\20201016\20201016_030	**Calibration ID:**	EC2000032
		Analysis Lot:	699559
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.2	NA	NA	NA	2.2	± 15 %	Quadratic

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Analyzed:**	10/19/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	9/15/20
File ID:	I:\LCMS01\DATA\20201019\20201019_007	**Calibration ID:**	EC2000032
		Analysis Lot:	699988
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.3	NA	NA	NA	2.7	± 15 %	Quadratic

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Analyzed:**	10/19/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	9/15/20
File ID:	I:\LCMS01\DATA\20201019\20201019_016	**Calibration ID:**	EC2000032
		Analysis Lot:	699988
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.4	NA	NA	NA	4.1	± 15 %	Quadratic

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Analyzed:**	10/16/20 09:21

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201016\20201016_007	**Lab Code:**	EQ2000509-01
Instrument ID:	E-LCMS-01	**Analysis Lot:**	699559
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	160,593	3.24
	Upper Limit ==>	240,890	5.24
	Lower Limit ==>	80,297	1.24
Associated Analyses			
Continuing Calibration Verification	EQ2000509-01	140,874	3.09

Results flagged with an asterisk (*) indicate values outside control criteria.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Analyzed:**	10/16/20 10:52

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201016\20201016_018	**Lab Code:**	EQ2000509-02
Instrument ID:	E-LCMS-01	**Analysis Lot:**	699559
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	160,593	3.24
	Upper Limit ==>	240,890	5.24
	Lower Limit ==>	80,297	1.24
Associated Analyses			
Continuing Calibration Verification	EQ2000509-02	134,004	3.10
Batch QC	E2000944-001	127,843	3.09
Batch QCDMS	EQ2000497-05	124,382	3.09

Results flagged with an asterisk (*) indicate values outside control criteria.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Analyzed:**	10/16/20 12:17

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201016\20201016_028	**Lab Code:**	EQ2000509-03
Instrument ID:	E-LCMS-01	**Analysis Lot:**	699559
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	160,593	3.24
	Upper Limit ==>	240,890	5.24
	Lower Limit ==>	80,297	1.24
Associated Analyses			
Continuing Calibration Verification	EQ2000509-03	137,447	3.09
Batch QCMS	EQ2000497-04	138,818	3.06

Results flagged with an asterisk (*) indicate values outside control criteria.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Analyzed:**	10/16/20 12:36

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201016\20201016_030	**Lab Code:**	EQ2000509-04
Instrument ID:	E-LCMS-01	**Analysis Lot:**	699559
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	160,593	3.24
	Upper Limit ==>	240,890	5.24
	Lower Limit ==>	80,297	1.24
Associated Analyses			
Continuing Calibration Verification	EQ2000509-04	140,968	3.05

Results flagged with an asterisk (*) indicate values outside control criteria.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Analyzed:**	10/19/20 15:18

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201019\20201019_007	**Lab Code:**	EQ2000516-01
Instrument ID:	E-LCMS-01	**Analysis Lot:**	699988
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	160,593	3.24
	Upper Limit ==>	240,890	5.24
	Lower Limit ==>	80,297	1.24
Associated Analyses			
Continuing Calibration Verification	EQ2000516-01	118,652	3.07
50WW09-201005	E2000964-001	124,284	3.07
50WW08-201005	E2000964-002	100,707	3.06
50WW22-201005	E2000964-003	108,432	3.06
50WW23-201005	E2000964-004	83,410	3.07
50WW15-201005	E2000964-005	131,728	3.07
50WW16-201005	E2000964-006	139,423	3.07
50WW18-201005	E2000964-007	126,127	3.02
50WW18-201005-FD	E2000964-008	119,581	3.07

Results flagged with an asterisk (*) indicate values outside control criteria.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000964
Project:	HS20100342	**Date Analyzed:**	10/19/20 16:58

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201019\20201019_016	**Lab Code:**	EQ2000516-02
Instrument ID:	E-LCMS-01	**Analysis Lot:**	699988
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	160,593	3.24
	Upper Limit ==>	240,890	5.24
	Lower Limit ==>	80,297	1.24
Associated Analyses			
Continuing Calibration Verification	EQ2000516-02	94,962	3.08

Results flagged with an asterisk (*) indicate values outside control criteria.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

PERCHLORATE7

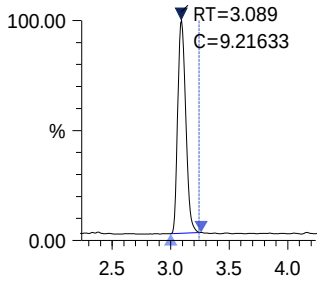
Date acquired: 10/9/2020 3:08:25 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201009\20201009_005.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/9/2020 3:08:25 PM	86435	9.21633	20201009_005	3.089	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/9/2020 3:08:25 PM	88538	1.00000	20201009_005	3.087	25.0000	1.0000	4

Perchlorate

Conc 9.21633
Area 86435

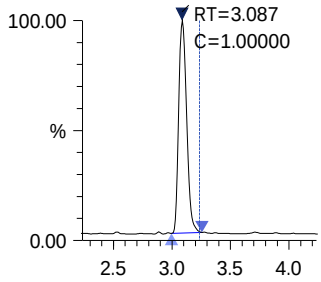
Q 99.00>83.00 (-) 1.83e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 88538

ISTD 107.00>89.00 (-) 1.90e4



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

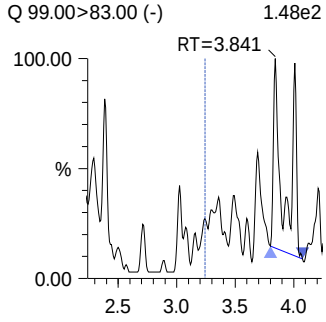
EQ2000497-01

Date acquired: 10/9/2020 3:24:21 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201009\20201009_007.lcd
Vial: 16 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000497-01	10/9/2020 3:24:21 PM	----	----	20201009_007	----	25.0000	1.0000	16
Sodium Perchlorate-18O4_IS	EQ2000497-01	10/9/2020 3:24:21 PM	96808	1.00000	20201009_007	3.098	25.0000	1.0000	16

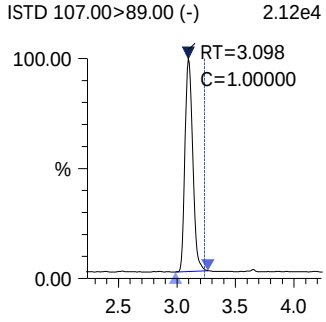
Perchlorate

Conc ----
Area ----



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 96808



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

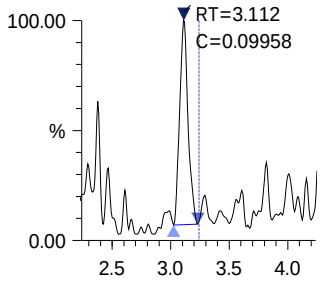
EQ2000497-02

Date acquired: 10/9/2020 3:32:16 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201009\20201009_008.lcd
Vial: 17 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000497-02	10/9/2020 3:32:16 PM	1240	0.09958	20201009_008	3.112	25.0000	1.0000	17
Sodium Perchlorate-18O4_IS	EQ2000497-02	10/9/2020 3:32:16 PM	102528	1.00000	20201009_008	3.102	25.0000	1.0000	17

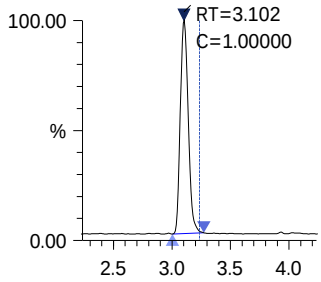
Perchlorate

Conc 0.09958
Area 1240
Q 99.00>83.00 (-) 2.59e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 102528
ISTD 107.00>89.00 (-) 2.19e4



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

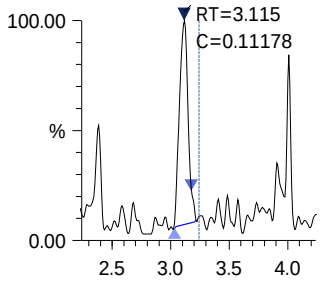
EQ2000497-03

Date acquired: 10/9/2020 3:40:10 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201009\20201009_009.lcd
Vial: 18 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000497-03	10/9/2020 3:40:10 PM	1391	0.11178	20201009_009	3.115	25.0000	1.0000	18
Sodium Perchlorate-18O4_IS	EQ2000497-03	10/9/2020 3:40:10 PM	103828	1.00000	20201009_009	3.100	25.0000	1.0000	18

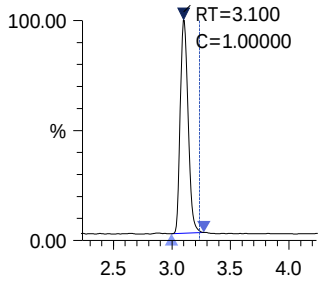
Perchlorate

Conc 0.11178
Area 1391
Q 99.00>83.00 (-) 3.62e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 103828
ISTD 107.00>89.00 (-) 2.24e4



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

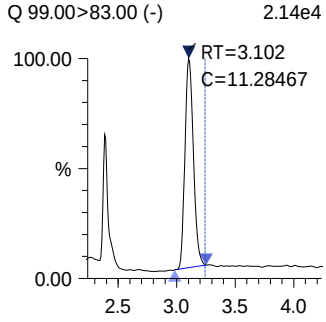
PERCHLORATE7

Date acquired: 10/9/2020 4:43:14 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201009\20201009_017.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/9/2020 4:43:14 PM	105826	11.28467	20201009_017	3.102	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/9/2020 4:43:14 PM	88721	1.00000	20201009_017	3.101	25.0000	1.0000	4

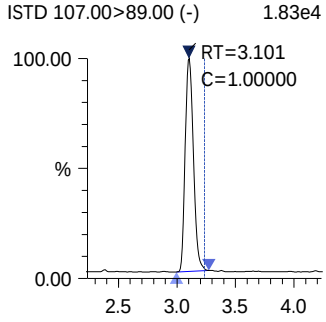
Perchlorate

Conc 11.28467
Area 105826



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 88721



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

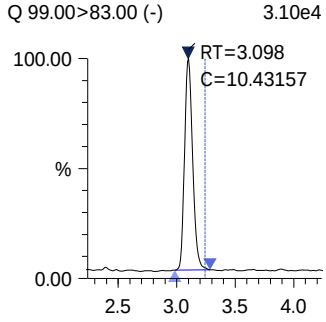
PERCHLORATE7

Date acquired: 10/16/2020 10:52:27 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201016\20201016_018.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/16/2020 10:52:27 AM	147880	10.43157	20201016_018	3.098	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/16/2020 10:52:27 AM	134004	1.00000	20201016_018	3.096	25.0000	1.0000	4

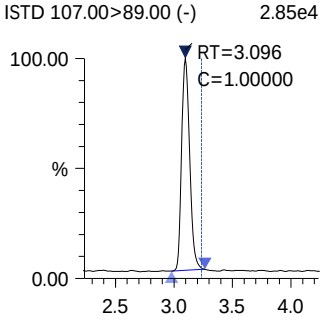
Perchlorate

Conc 10.43157
Area 147880



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 134004



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

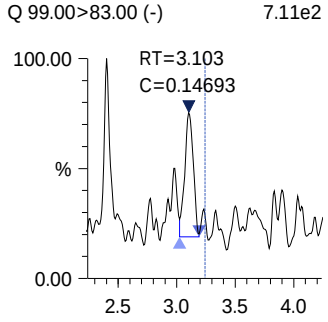
EQ2000497-05X10

Date acquired: 10/16/2020 12:09:51 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201016\20201016_027.lcd
Vial: 28 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000497-05X10	10/16/2020 12:09:51 PM	2121	0.14693	20201016_027	3.103	25.0000	1.0000	28
Sodium Perchlorate-18O4_IS	EQ2000497-05X10	10/16/2020 12:09:51 PM	124382	1.00000	20201016_027	3.089	25.0000	1.0000	28

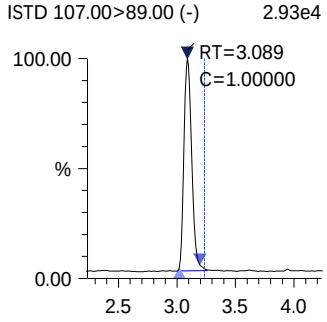
Perchlorate

Conc 0.14693
Area 2121



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 124382



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

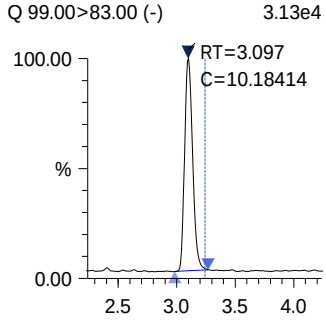
PERCHLORATE7

Date acquired: 10/16/2020 12:17:43 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201016\20201016_028.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/16/2020 12:17:43 PM	148120	10.18414	20201016_028	3.097	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/16/2020 12:17:43 PM	137447	1.00000	20201016_028	3.094	25.0000	1.0000	4

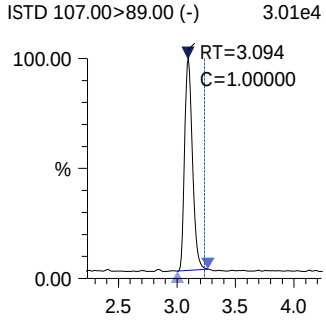
Perchlorate

Conc 10.18414
Area 148120



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 137447



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

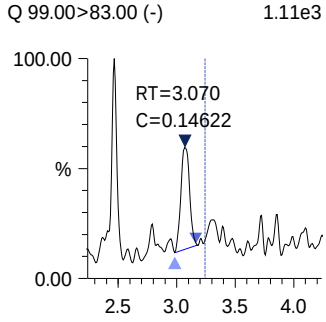
EQ2000497-04X10

Date acquired: 10/16/2020 12:25:41 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201016\20201016_029.lcd
Vial: 27 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000497-04X10	10/16/2020 12:25:41 PM	2356	0.14622	20201016_029	3.070	25.0000	1.0000	27
Sodium Perchlorate-18O4_IS	EQ2000497-04X10	10/16/2020 12:25:41 PM	138818	1.00000	20201016_029	3.062	25.0000	1.0000	27

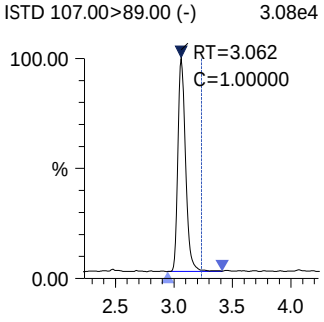
Perchlorate

Conc 0.14622
Area 2356



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 138818



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

PERCHLORATE7

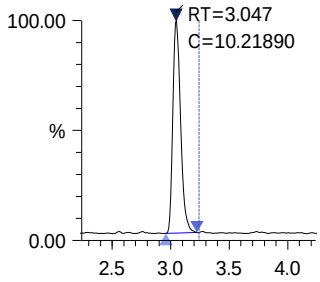
Date acquired: 10/16/2020 12:36:13 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201016\20201016_030.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/16/2020 12:36:13 PM	152426	10.21890	20201016_030	3.047	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/16/2020 12:36:13 PM	140968	1.00000	20201016_030	3.045	25.0000	1.0000	4

Perchlorate

Conc 10.21890
Area 152426

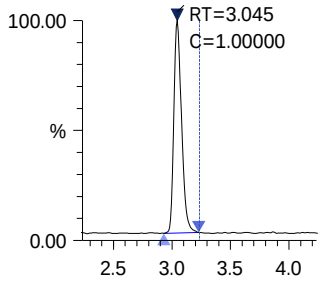
Q 99.00>83.00 (-) 3.37e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 140968

ISTD 107.00>89.00 (-) 3.11e4



RIGHT SOLUTIONS | RIGHT PARTNER

microbialinsights

10515 Research Drive
Knoxville, TN 37932
Phone: (865) 573-8188
Fax: (865) 573-8133

ANAB ANSI National Accreditation Board ACCREDITED ISO/IEC 17025 TESTING LABORATORY

Client: Susan Huang
APTIM
4005 Port Chicago Hwy
Concord, CA 94520

Phone: 925-288-2099

Fax:

Identifier: 076SA **Date Rec:** 01/29/2021 **Report Date:** 02/05/2021

Client Project #: 501032 **Client Project Name:** LHAAP 50 January 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 50 January 2021

MI Project Number: **076SA**
Date Received: 01/29/2021

Sample Information

Client Sample ID:		**50WW14-210128**	**50WW13-210128**	**50WW11-210128**	**50WW06-210128**	**50WW12-210128**
Sample Date:		01/28/2021	01/28/2021	01/28/2021	01/28/2021	01/28/2021
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*	**3.30E+00**	**5.00E+00**	**1.40E+00**	**6.00E-01**	**5.00E-01 (J)**

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 **1/29/2021**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	01/29/2021	02/05/2021	0 °C	108%	non-detect	non-detect

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 04, 2021

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS21011122**

Laboratory Results for: **LHAAP50 January 2021**

Dear Susan Huang,

ALS Environmental received 4 sample(s) on Jan 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
RJ Modashia
Project Manager

ALS Houston, US Date: 04-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2021
Work Order: HS21011122

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21011122-01	50WW08-210125	Groundwater		25-Jan-2021 12:45	27-Jan-2021 10:05	☐
HS21011122-02	50WW05-210125	Groundwater		25-Jan-2021 13:30	27-Jan-2021 10:05	☐
HS21011122-03	50WW29-210125	Groundwater		25-Jan-2021 14:15	27-Jan-2021 10:05	☐
HS21011122-04	Trip Blank-210125	Water	CG 121520 -128	25-Jan-2021 00:00	27-Jan-2021 10:05	☐

ALS Houston, US Date: 04-Feb-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP50 January 2021
Work Order: HS21011122

Work Order Comments

• Analysis of Perchlorate was performed by ALS Houston TX, High Resolution. Laboratory. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R377396

Sample ID: HS21011103-06MSD

• MSD is for an unrelated sample

Batch ID: R377394

Sample ID: HS21011223-12MSD

• MSD is for an unrelated sample

Batch ID: R377477

Sample ID: HS21011077-02MSD

• MSD is for an unrelated sample

ALS Houston, US Date: 04-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2021
Sample ID: 50WW08-210125
Collection Date: 25-Jan-2021 12:45

ANALYTICAL REPORT
WorkOrder:HS21011122
Lab ID:HS21011122-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**0.82**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	03-Feb-2021 02:11
1,2-Dichloroethane	**2.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	03-Feb-2021 02:11
cis-1,2-Dichloroethene	**55**		**0.20**	**0.50**	**1.0**	**ug/L**	1	03-Feb-2021 02:11
Tetrachloroethene	**1.4**		**0.30**	**1.0**	**1.0**	**ug/L**	1	03-Feb-2021 02:11
Trichloroethene	**550**		**2.0**	**5.0**	**10**	**ug/L**	10	03-Feb-2021 03:15
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 02:11
Surr: 1,2-Dichloroethane-d4	*95.9*			**0**	*81-118*	*%REC*	*1*	*03-Feb-2021 02:11*
Surr: 1,2-Dichloroethane-d4	*91.1*			**0**	*81-118*	*%REC*	*10*	*03-Feb-2021 03:15*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*03-Feb-2021 02:11*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*10*	*03-Feb-2021 03:15*
Surr: Dibromofluoromethane	*95.8*			**0**	*80-119*	*%REC*	*1*	*03-Feb-2021 02:11*
Surr: Dibromofluoromethane	*94.1*			**0**	*80-119*	*%REC*	*10*	*03-Feb-2021 03:15*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*03-Feb-2021 02:11*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*10*	*03-Feb-2021 03:15*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	02-Feb-2021 19:02

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

ALS Houston, US Date: 04-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2021
Sample ID: 50WW05-210125
Collection Date: 25-Jan-2021 13:30

ANALYTICAL REPORT
WorkOrder:HS21011122
Lab ID:HS21011122-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**4.4**		**0.20**	**0.50**	**1.0**	**ug/L**	1	02-Feb-2021 20:14
1,2-Dichloroethane	**2.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	02-Feb-2021 20:14
cis-1,2-Dichloroethene	**160**		**0.20**	**0.50**	**1.0**	**ug/L**	1	02-Feb-2021 20:14
Tetrachloroethene	**0.86**	J	**0.30**	**1.0**	**1.0**	**ug/L**	1	02-Feb-2021 20:14
Trichloroethene	**270**		**1.0**	**2.5**	**5.0**	**ug/L**	5	04-Feb-2021 03:55
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	02-Feb-2021 20:14
Surr: 1,2-Dichloroethane-d4	*95.2*			**0**	*81-118*	*%REC*	*1*	*02-Feb-2021 20:14*
Surr: 1,2-Dichloroethane-d4	*96.8*			**0**	*81-118*	*%REC*	*5*	*04-Feb-2021 03:55*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*02-Feb-2021 20:14*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*5*	*04-Feb-2021 03:55*
Surr: Dibromofluoromethane	*97.0*			**0**	*80-119*	*%REC*	*1*	*02-Feb-2021 20:14*
Surr: Dibromofluoromethane	*96.8*			**0**	*80-119*	*%REC*	*5*	*04-Feb-2021 03:55*
Surr: Toluene-d8	*99.2*			**0**	*89-112*	*%REC*	*1*	*02-Feb-2021 20:14*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*5*	*04-Feb-2021 03:55*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	02-Feb-2021 19:02

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

ALS Houston, US Date: 04-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2021
Sample ID: 50WW29-210125
Collection Date: 25-Jan-2021 14:15

ANALYTICAL REPORT
WorkOrder:HS21011122
Lab ID:HS21011122-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	02-Feb-2021 19:53
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	02-Feb-2021 19:53
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	02-Feb-2021 19:53
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	02-Feb-2021 19:53
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	02-Feb-2021 19:53
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	02-Feb-2021 19:53
Surr: 1,2-Dichloroethane-d4	*95.9*			**0**	*81-118*	*%REC*	*1*	*02-Feb-2021 19:53*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*02-Feb-2021 19:53*
Surr: Dibromofluoromethane	*96.1*			**0**	*80-119*	*%REC*	*1*	*02-Feb-2021 19:53*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*02-Feb-2021 19:53*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	02-Feb-2021 19:02

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

ALS Houston, US Date: 04-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2021
Sample ID: Trip Blank-210125
Collection Date: 25-Jan-2021 00:00

ANALYTICAL REPORT
WorkOrder:HS21011122
Lab ID:HS21011122-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	02-Feb-2021 19:32
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	02-Feb-2021 19:32
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	02-Feb-2021 19:32
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	02-Feb-2021 19:32
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	02-Feb-2021 19:32
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	02-Feb-2021 19:32
Surr: 1,2-Dichloroethane-d4	*92.4*			**0**	*81-118*	*%REC*	*1*	*02-Feb-2021 19:32*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*02-Feb-2021 19:32*
Surr: Dibromofluoromethane	*95.0*			**0**	*80-119*	*%REC*	*1*	*02-Feb-2021 19:32*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*02-Feb-2021 19:32*

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

ALS Houston, US Date: 04-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2021
WorkOrder: HS21011122

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R377381 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS21011122-01	50WW08-210125	25 Jan 2021 12:45			02 Feb 2021 19:02	1
HS21011122-02	50WW05-210125	25 Jan 2021 13:30			02 Feb 2021 19:02	1
HS21011122-03	50WW29-210125	25 Jan 2021 14:15			02 Feb 2021 19:02	1
Batch ID: R377394 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21011122-04	Trip Blank-210125	25 Jan 2021 00:00			02 Feb 2021 19:32	1
Batch ID: R377394 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21011122-02	50WW05-210125	25 Jan 2021 13:30			02 Feb 2021 20:14	1
HS21011122-03	50WW29-210125	25 Jan 2021 14:15			02 Feb 2021 19:53	1
Batch ID: R377396 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21011122-01	50WW08-210125	25 Jan 2021 12:45			03 Feb 2021 03:15	10
HS21011122-01	50WW08-210125	25 Jan 2021 12:45			03 Feb 2021 02:11	1
Batch ID: R377477 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21011122-02	50WW05-210125	25 Jan 2021 13:30			04 Feb 2021 03:55	5

ALS Houston, US Date: 04-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2021
WorkOrder: HS21011122

QC BATCH REPORT

Batch ID: R377394 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210202** Units: **ug/L** Analysis Date: **02-Feb-2021 11:48**
Client ID: Run ID: **VOA6_377394** SeqNo: **5941638** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
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
Tetrachloroethene	1.0	1.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.53*	*1.0*	*50*	*0*	*93.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.42*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*47.34*	*1.0*	*50*	*0*	*94.7*	*80 - 119*				
Surr: Toluene-d8	*51.06*	*1.0*	*50*	*0*	*102*	*89 - 112*				

LCS Sample ID: **VLCSW-210202** Units: **ug/L** Analysis Date: **02-Feb-2021 11:06**
Client ID: Run ID: **VOA6_377394** SeqNo: **5941637** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	16.9	1.0	20	0	84.5	71 - 131				
1,2-Dichloroethane	18.29	1.0	20	0	91.4	73 - 128				
cis-1,2-Dichloroethene	18.93	1.0	20	0	94.7	78 - 123				
Tetrachloroethene	19.3	1.0	20	0	96.5	74 - 129				
Trichloroethene	19.92	1.0	20	0	99.6	79 - 123				
Vinyl chloride	16.97	1.0	20	0	84.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.09*	*1.0*	*50*	*0*	*96.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.17*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*49.56*	*1.0*	*50*	*0*	*99.1*	*80 - 119*				
Surr: Toluene-d8	*48.39*	*1.0*	*50*	*0*	*96.8*	*89 - 112*				

ALS Houston, US Date: 04-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2021
WorkOrder: HS21011122

QC BATCH REPORT

Batch ID: R377394 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS21011223-12MS** Units: **ug/L** Analysis Date: **02-Feb-2021 15:40**
Client ID: Run ID: **VOA6_377394** SeqNo: **5941649** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	17.53	1.0	20	0	87.7	71 - 131				
1,2-Dichloroethane	18.29	1.0	20	0	91.5	73 - 128				
cis-1,2-Dichloroethene	18.2	1.0	20	0	91.0	78 - 123				
Tetrachloroethene	22.19	1.0	20	0.7256	107	74 - 129				
Trichloroethene	20.63	1.0	20	0	103	79 - 123				
Vinyl chloride	12.56	1.0	20	0	62.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*47.05*	*1.0*	*50*	*0*	*94.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.77*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*48.25*	*1.0*	*50*	*0*	*96.5*	*80 - 119*				
Surr: Toluene-d8	*49.57*	*1.0*	*50*	*0*	*99.1*	*89 - 112*				

MS Sample ID: **HS21011223-11MS** Units: **ug/L** Analysis Date: **02-Feb-2021 14:58**
Client ID: Run ID: **VOA6_377394** SeqNo: **5941647** PrepDate: DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	1622	100	2000	0	81.1	71 - 131				
1,2-Dichloroethane	1657	100	2000	0	82.8	73 - 128				
cis-1,2-Dichloroethene	2175	100	2000	460.4	85.7	78 - 123				
Tetrachloroethene	3041	100	2000	958.2	104	74 - 129				
Trichloroethene	9206	100	2000	7264	97.1	79 - 123				
Vinyl chloride	1226	100	2000	0	61.3	58 - 137				
Surr: 1,2-Dichloroethane-d4	*4683*	*100*	*5000*	*0*	*93.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*5106*	*100*	*5000*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*4723*	*100*	*5000*	*0*	*94.5*	*80 - 119*				
Surr: Toluene-d8	*4843*	*100*	*5000*	*0*	*96.9*	*89 - 112*				

ALS Houston, US Date: 04-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2021
WorkOrder: HS21011122

QC BATCH REPORT

Batch ID: R377394 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS21011223-12MSD** Units: **ug/L** Analysis Date: **02-Feb-2021 16:01**
Client ID: Run ID: **VOA6_377394** SeqNo: **5941650** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1-Dichloroethene	16.98	1.0	20	0	84.9	71 - 131	17.53	3.2	20	
1,2-Dichloroethane	18.09	1.0	20	0	90.5	73 - 128	18.29	1.1	20	
cis-1,2-Dichloroethene	18.76	1.0	20	0	93.8	78 - 123	18.2	3.02	20	
Tetrachloroethene	22.05	1.0	20	0.7256	107	74 - 129	22.19	0.657	20	
Trichloroethene	20.48	1.0	20	0	102	79 - 123	20.63	0.757	20	
Vinyl chloride	12.04	1.0	20	0	60.2	58 - 137	12.56	4.22	20	
Surr: 1,2-Dichloroethane-d4	*45.59*	*1.0*	*50*	*0*	*91.2*	*81 - 118*	*47.05*	*3.14*	*20*	
Surr: 4-Bromofluorobenzene	*51.46*	*1.0*	*50*	*0*	*103*	*85 - 114*	*51.77*	*0.598*	*20*	
Surr: Dibromofluoromethane	*47.75*	*1.0*	*50*	*0*	*95.5*	*80 - 119*	*48.25*	*1.05*	*20*	
Surr: Toluene-d8	*49.87*	*1.0*	*50*	*0*	*99.7*	*89 - 112*	*49.57*	*0.6*	*20*	

MSD Sample ID: **HS21011223-11MSD** Units: **ug/L** Analysis Date: **02-Feb-2021 15:19**
Client ID: Run ID: **VOA6_377394** SeqNo: **5941648** PrepDate: DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1-Dichloroethene	1559	100	2000	0	77.9	71 - 131	1622	4	20	
1,2-Dichloroethane	1662	100	2000	0	83.1	73 - 128	1657	0.317	20	
cis-1,2-Dichloroethene	2104	100	2000	460.4	82.2	78 - 123	2175	3.31	20	
Tetrachloroethene	2903	100	2000	958.2	97.2	74 - 129	3041	4.65	20	
Trichloroethene	8735	100	2000	7264	73.5	79 - 123	9206	5.26	20	S
Vinyl chloride	1186	100	2000	0	59.3	58 - 137	1226	3.33	20	
Surr: 1,2-Dichloroethane-d4	*4585*	*100*	*5000*	*0*	*91.7*	*81 - 118*	*4683*	*2.11*	*20*	
Surr: 4-Bromofluorobenzene	*5182*	*100*	*5000*	*0*	*104*	*85 - 114*	*5106*	*1.49*	*20*	
Surr: Dibromofluoromethane	*4754*	*100*	*5000*	*0*	*95.1*	*80 - 119*	*4723*	*0.655*	*20*	
Surr: Toluene-d8	*4981*	*100*	*5000*	*0*	*99.6*	*89 - 112*	*4843*	*2.81*	*20*	

The following samples were analyzed in this batch: HS21011122-02 HS21011122-03 HS21011122-04

ALS Houston, US Date: 04-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2021
WorkOrder: HS21011122

QC BATCH REPORT

Batch ID: R377396 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210202** Units: **ug/L** Analysis Date: **02-Feb-2021 23:02**
Client ID: Run ID: **VOA6_377396** SeqNo: **5941674** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
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
Tetrachloroethene	1.0	1.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.35*	*1.0*	*50*	*0*	*92.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.5*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*47.71*	*1.0*	*50*	*0*	*95.4*	*80 - 119*				
Surr: Toluene-d8	*49.97*	*1.0*	*50*	*0*	*99.9*	*89 - 112*				

LCS Sample ID: **VLCSW-210202** Units: **ug/L** Analysis Date: **02-Feb-2021 22:20**
Client ID: Run ID: **VOA6_377396** SeqNo: **5941673** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	19.58	1.0	20	0	97.9	71 - 131				
1,2-Dichloroethane	19.57	1.0	20	0	97.8	73 - 128				
cis-1,2-Dichloroethene	21.25	1.0	20	0	106	78 - 123				
Tetrachloroethene	20.78	1.0	20	0	104	74 - 129				
Trichloroethene	21.72	1.0	20	0	109	79 - 123				
Vinyl chloride	19.77	1.0	20	0	98.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.38*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.08*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*51.31*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*48.93*	*1.0*	*50*	*0*	*97.9*	*89 - 112*				

ALS Houston, US Date: 04-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2021
WorkOrder: HS21011122

QC BATCH REPORT

Batch ID: R377396 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS21011103-06MS** Units: **ug/L** Analysis Date: **03-Feb-2021 02:33**
Client ID: Run ID: **VOA6_377396** SeqNo: **5941684** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1-Dichloroethene	17.17	1.0	20	0	85.8	71 - 131				
1,2-Dichloroethane	18.2	1.0	20	0	91.0	73 - 128				
cis-1,2-Dichloroethene	18.16	1.0	20	0	90.8	78 - 123				
Tetrachloroethene	21.11	1.0	20	0	106	74 - 129				
Trichloroethene	20.8	1.0	20	0	104	79 - 123				
Vinyl chloride	12.73	1.0	20	0	63.7	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.41*	*1.0*	*50*	*0*	*90.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.6*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*47.33*	*1.0*	*50*	*0*	*94.7*	*80 - 119*				
Surr: Toluene-d8	*49.06*	*1.0*	*50*	*0*	*98.1*	*89 - 112*				

MSD Sample ID: **HS21011103-06MSD** Units: **ug/L** Analysis Date: **03-Feb-2021 02:54**
Client ID: Run ID: **VOA6_377396** SeqNo: **5941685** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1-Dichloroethene	15.57	1.0	20	0	77.8	71 - 131	17.17	9.77	20	
1,2-Dichloroethane	16.82	1.0	20	0	84.1	73 - 128	18.2	7.9	20	
cis-1,2-Dichloroethene	16.87	1.0	20	0	84.3	78 - 123	18.16	7.36	20	
Tetrachloroethene	18.71	1.0	20	0	93.5	74 - 129	21.11	12.1	20	
Trichloroethene	18.68	1.0	20	0	93.4	79 - 123	20.8	10.8	20	
Vinyl chloride	11.37	1.0	20	0	56.9	58 - 137	12.73	11.3	20	S
Surr: 1,2-Dichloroethane-d4	*45.5*	*1.0*	*50*	*0*	*91.0*	*81 - 118*	*45.41*	*0.197*	*20*	
Surr: 4-Bromofluorobenzene	*51.2*	*1.0*	*50*	*0*	*102*	*85 - 114*	*52.6*	*2.69*	*20*	
Surr: Dibromofluoromethane	*47.25*	*1.0*	*50*	*0*	*94.5*	*80 - 119*	*47.33*	*0.159*	*20*	
Surr: Toluene-d8	*49.04*	*1.0*	*50*	*0*	*98.1*	*89 - 112*	*49.06*	*0.0295*	*20*	

The following samples were analyzed in this batch: HS21011122-01

ALS Houston, US Date: 04-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2021
WorkOrder: HS21011122

QC BATCH REPORT

Batch ID: R377477 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210203** Units: **ug/L** Analysis Date: **03-Feb-2021 23:00**
Client ID: Run ID: **VOA6_377477** SeqNo: **5943426** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*47.08*	*1.0*	*50*	*0*	*94.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.89*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*48.52*	*1.0*	*50*	*0*	*97.0*	*80 - 119*				
Surr: Toluene-d8	*49.43*	*1.0*	*50*	*0*	*98.9*	*89 - 112*				

LCS Sample ID: **VLCSW-210203** Units: **ug/L** Analysis Date: **03-Feb-2021 22:18**
Client ID: Run ID: **VOA6_377477** SeqNo: **5943425** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	20.55	1.0	20	0	103	79 - 123				
Surr: 1,2-Dichloroethane-d4	*50.2*	*1.0*	*50*	*0*	*100*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.13*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*51.7*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*47.46*	*1.0*	*50*	*0*	*94.9*	*89 - 112*				

MS Sample ID: **HS21011077-06MS** Units: **ug/L** Analysis Date: **04-Feb-2021 02:10**
Client ID: Run ID: **VOA6_377477** SeqNo: **5943435** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	32.33	1.0	20	13.06	96.4	79 - 123				
Surr: 1,2-Dichloroethane-d4	*44.65*	*1.0*	*50*	*0*	*89.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.85*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*46.61*	*1.0*	*50*	*0*	*93.2*	*80 - 119*				
Surr: Toluene-d8	*48.45*	*1.0*	*50*	*0*	*96.9*	*89 - 112*				

ALS Houston, US Date: 04-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2021
WorkOrder: HS21011122

QC BATCH REPORT

Batch ID: R377477 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS21011077-02MS** Units: **ug/L** Analysis Date: **04-Feb-2021 02:52**
Client ID: Run ID: **VOA6_377477** SeqNo: **5943437** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	86.16	1.0	20	65.04	106	79 - 123				
Surr: 1,2-Dichloroethane-d4	*45.67*	*1.0*	*50*	*0*	*91.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.3*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*47.51*	*1.0*	*50*	*0*	*95.0*	*80 - 119*				
Surr: Toluene-d8	*49.54*	*1.0*	*50*	*0*	*99.1*	*89 - 112*				

MSD Sample ID: **HS21011077-06MSD** Units: **ug/L** Analysis Date: **04-Feb-2021 02:31**
Client ID: Run ID: **VOA6_377477** SeqNo: **5943436** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	31.18	1.0	20	13.06	90.6	79 - 123	32.33	3.64	20	
Surr: 1,2-Dichloroethane-d4	*46.1*	*1.0*	*50*	*0*	*92.2*	*81 - 118*	*44.65*	*3.2*	*20*	
Surr: 4-Bromofluorobenzene	*51.36*	*1.0*	*50*	*0*	*103*	*85 - 114*	*52.85*	*2.86*	*20*	
Surr: Dibromofluoromethane	*46.68*	*1.0*	*50*	*0*	*93.4*	*80 - 119*	*46.61*	*0.154*	*20*	
Surr: Toluene-d8	*48.71*	*1.0*	*50*	*0*	*97.4*	*89 - 112*	*48.45*	*0.536*	*20*	

MSD Sample ID: **HS21011077-02MSD** Units: **ug/L** Analysis Date: **04-Feb-2021 03:13**
Client ID: Run ID: **VOA6_377477** SeqNo: **5943438** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	80.4	1.0	20	65.04	76.8	79 - 123	86.16	6.92	20	S
Surr: 1,2-Dichloroethane-d4	*44.69*	*1.0*	*50*	*0*	*89.4*	*81 - 118*	*45.67*	*2.16*	*20*	
Surr: 4-Bromofluorobenzene	*50.05*	*1.0*	*50*	*0*	*100*	*85 - 114*	*51.3*	*2.47*	*20*	
Surr: Dibromofluoromethane	*47.11*	*1.0*	*50*	*0*	*94.2*	*80 - 119*	*47.51*	*0.827*	*20*	
Surr: Toluene-d8	*48.54*	*1.0*	*50*	*0*	*97.1*	*89 - 112*	*49.54*	*2.05*	*20*	

The following samples were analyzed in this batch: HS21011122-02

ALS Houston, US Date: 04-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2021
WorkOrder: **HS21011122**

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	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	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	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2021	31-Dec-2021
North Dakota	R-193 2020-2021	30-Apr-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US Date: 04-Feb-21

Sample Receipt Checklist

Work Order ID: HS21011122 **Date/Time Received:** **27-Jan-2021 10:05**

Client Name: CBI-Houston **Received by:** **Jared R. Makan**

Completed By: /S/ Jared R. Makan (eSignature) 28-Jan-2021 21:49 (Date/Time) **Reviewed by:** /S/ Corey Grandits (eSignature) 29-Jan-2021 10:37 (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):	0.8°C UC/C	IR31
Cooler(s)/Kit(s):	Blue	
Date/Time sample(s) sent to storage:	01/28/2021 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:

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: **LHAAP50 January 2021**

Prepared By: Scott Deesinger

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 (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW6850	Remarks (Preservatives, etc.)	Lab I.D.#
50WW08-210125	WG	1/25/21 1245		4	X					X		
50WW05-210125	WG	1/25/21 1330		4	X					X		
50WW29-210125	WG	1/25/21 1415		4	X					X		
TRIP BLANK-210125	W	1/25/21		2	X							

Additional Remarks: **Standard TAT on all parameters. Please email results to Susan.Huang@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 Deesinger	1/26/21	1430	JM	1/27/2021	10:05						

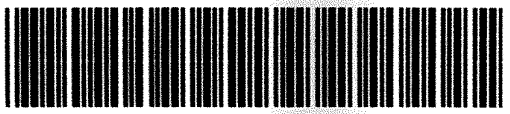
For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

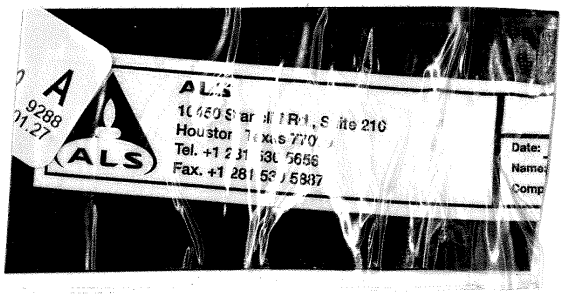
HS21011122

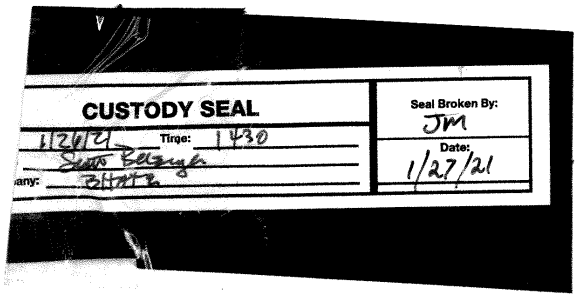
Aptim Environmental & Infrastucture, Inc.
LHAAP50 January 2021

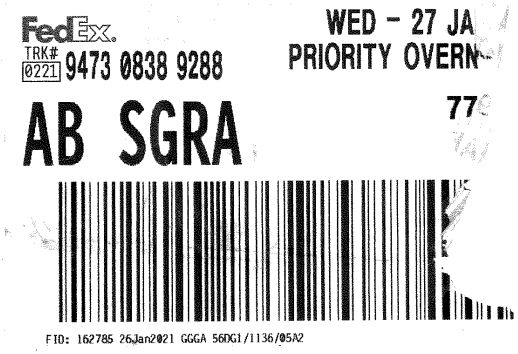


BIOL VIC. 0.8°. #31

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly CIF 0.6°


A
9288
01.27
ALS
Tel. +1
Fax. +1
Date:
Name:
Comp


CUSTODY SEAL
Time: 1430
Seal Broken By:
JM
Date:
1/27/21


FedEx.
TRK#
0221 9473 0838 9288
WED - 27 JA
PRIORITY OVERN
AB SGRA
FID: 162785 26Jan2021 GGGA 56DG1/1136/05A2

February 02, 2021 Service Request No:E2100118

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: HS21011122

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 29, 2021
For your reference, these analyses have been assigned our service request number **E2100118.**

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

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.:**	E2100118
Project:	HS21011122	**Date Received:**	01/29/21
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

Three samples were received for analysis at ALS Environmental in Houston on 01/29/21.

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:

EQ2100046: 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 performed on an unrelated sample/

Samples E2100118-003 lowest practical dilution performed due to matrix 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
Project: HS21011122 **Service Request:**E2100118

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100118-001	50WW08-210125	1/25/2021	1245
E2100118-002	50WW05-210125	1/25/2021	1330
E2100118-003	50WW29-210125	1/25/2021	1415

Service Request Summary

Folder #: **E2100118**
Client Name: ALS Environmental - US
Project Name: HS21011122
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: 01/29/21
Internal Due Date: 2/10/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21011122
EDD: No EDD Specified

3 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved
Location: EHRMS-WIC 4A
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100118-001	50WW08-210125	Ground Water	01/25/21 1245	**IV**
E2100118-002	50WW05-210125	Ground Water	01/25/21 1330	**IV**
E2100118-003	50WW29-210125	Ground Water	01/25/21 1415	**IV**

Service Request Summary

Folder #: **E2100118**
Client Name: ALS Environmental - US
Project Name: HS21011122
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: 01/29/21
Internal Due Date: 2/10/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21011122
EDD: No EDD Specified

3 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved
Location: EHRMS-WIC 4A
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	3	II Due 2/10,IV due 2/17

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	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
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
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
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	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
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:** **15564**

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:	HS21011122
TSR:	Sonja West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21011122-01**	**50WW08-210125**	**Groundwater**	**25 Jan 2021 12:45**
	Provide Level II and Level IV reports on a seperate pdf.			05 Feb 2021
2.	**HS21011122-02**	**50WW05-210125**	**Groundwater**	**25 Jan 2021 13:30**
	Provide Level II and Level IV reports on a seperate pdf.			05 Feb 2021
3.	**HS21011122-03**	**50WW29-210125**	**Groundwater**	**25 Jan 2021 14:15**
	Provide Level II and Level IV reports on a seperate pdf.			05 Feb 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: J. Lawal Date/Time:

Received By: Date/Time: 1/24/21 1704

Cooler ID(s): Temperature(s):

ALS Environmental

Cooler Receipt Form

Project Chemist CG

Client/Project ALS-KI

Thermometer ID 1231

Date/Time Received: 112912 1 Initials: CG Date/Time Logged in: 112912 1 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		112912 1	1204	CG	0.3	X
						☐
						☐
						☐

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#: 373567 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/JRODRIGUEZ **Prep Method:** Method **Prep Date/Time:** 2/1/21 09:04

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100117-001	50WW14-210128	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2100117-002	50WW14-210128-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2100117-003	50WW13-210128	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2100117-004	50WW11-210128	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100117-005	50WW06-210128	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100117-006	50WW12-210128	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100118-001	50WW08-210125	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2100118-002	50WW05-210125	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2100118-003	50WW29-210125	.01	6850/ClO4 DOD			Ground Water	10mL	
10	EQ2100046-01	MB		6850/ClO4 DOD			Liquid	10mL	
11	EQ2100046-02	LCS		6850/ClO4 DOD			Liquid	10mL	
12	EQ2100046-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
13	EQ2100046-04	50WW12-210128 MS	.02	6850/ClO4 DOD			Liquid	10mL	
14	EQ2100046-05	50WW12-210128 DMS	.03	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100046-02	1.00µL	EQ2100046-03	1.00µL	EQ2100046-04	1.00µL	EQ2100046-05	1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100117-001	100.00µL	E2100117-002	100.00µL	E2100117-003	100.00µL	E2100117-004	100.00µL	E2100117-005	100.00µL	E2100117-006	100.00µL
E2100117-006.R	100.00µL	E2100118-001	100.00µL	E2100118-002	100.00µL	E2100118-003	100.00µL	EQ2100046-01	100.00µL	EQ2100046-02	100.00µL
EQ2100046-03	100.00µL	EQ2100046-04	100.00µL	EQ2100046-05	100.00µL						

Preparation Steps

Step: Preparation
Started: 2/1/21 09:04
Finished: 2/1/21 09:29
By: GRIVERA
Comments

Comments: _____

Preparation Information Benchsheet

Prep Run#: 373567
Team: Semivoa GCMS/JRODRIGUEZ

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 2/1/21 09:04

Reviewed By: GR Date: 2/1/21

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:**	E2100118
Project:	HS21011122	**Date Collected:**	1/25/21 1245
Sample Matrix:	Ground Water	**Date Received:**	1/29/21
Sample Name:	50WW08-210125	**Units:**	µg/L
Lab Code:	E2100118-001	**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	**126**		1.00	0.500	0.250	10	2/ 1/21	2/2/21 14:02	373567	711866	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100118
Project:	HS21011122	**Date Collected:**	1/25/21 1330
Sample Matrix:	Ground Water	**Date Received:**	1/29/21
Sample Name:	50WW05-210125	**Units:**	µg/L
Lab Code:	E2100118-002	**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	0.100	0.0500	0.0250	1	2/ 1/21	2/2/21 12:51	373567	711866	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100118
Project:	HS21011122	**Date Collected:**	1/25/21 1415
Sample Matrix:	Ground Water	**Date Received:**	1/29/21
Sample Name:	50WW29-210125	**Units:**	µg/L
Lab Code:	E2100118-003	**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	1.00	0.500	0.250	10	2/ 1/21	2/2/21 14:28	373567	711866	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100118
Project:	HS21011122	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100046-01	**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	2/ 1/21	2/2/21 12:28	373567	711866	

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:**	E2100118
Project:	HS21011122	**Date Analyzed:**	2/ 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:**	NA
		Extraction Lot:	373567

	Lab Control Sample EQ2100046-02			Duplicate Lab Control Sample EQ2100046-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0908	0.100	91	0.101	0.100	101	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:**	E2100118
Project:	HS21011122	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100046-02	**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	**0.0908**	J	0.100	0.0500	0.0250	1	2/ 1/21	2/2/21 14:36	373567	711866	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100118
Project:	HS21011122	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100046-03	**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	**0.101**		0.100	0.0500	0.0250	1	2/ 1/21	2/2/21 12:35	373567	711866	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100118
Project:	HS21011122	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
		Date Analyzed:	2/ 1/21

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	E2100117-006	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		Batch QCMS **Matrix Spike** EQ2100046-04				Batch QCDMS **Duplicate Matrix Spike** EQ2100046-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	83800	60800	0.100	-2300760#	60700	0.100	-2309488#	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:**	E2100118
Project:	HS21011122	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	EQ2100046-04	**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	**60800**	E	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 18:36	373567	711817	*

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100118
Project:	HS21011122	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	EQ2100046-05	**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	**60700**	E	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 18:44	373567	711817	*

March 17, 2021 Service Request No:E2100117

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: HS21011150

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 29, 2021
For your reference, these analyses have been assigned our service request number **E2100117.**

Revision I - This report was revised to add the missing raw data for client samples in SR E2100117.

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.:**	E2100117
Project:	HS21011150	**Date Received:**	01/29/21
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 IV. 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 01/29/21.

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:

EQ2100046: 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 outside QC limits; parent sample 83,800 ug/L.

Samples E2100117-001/002 lowest practical dilution performed due to matrix 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:**E2100117
Project: HS21011150

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100117-001	50WW14-210128	1/28/2021	0750
E2100117-002	50WW14-210128-FD	1/28/2021	0750
E2100117-003	50WW13-210128	1/28/2021	0850
E2100117-004	50WW11-210128	1/28/2021	0945
E2100117-005	50WW06-210128	1/28/2021	1035
E2100117-006	50WW12-210128	1/28/2021	1130

Service Request Summary

Folder #: **E2100117**
Client Name: ALS Environmental - US
Project Name: HS21011150
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: 01/29/21
Internal Due Date: 2/12/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21011150
EDD: No EDD Specified

8 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved
Location: EHRMS-WIC 4A
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100117-001	50WW14-210128	Ground Water	01/28/21 0750	**IV**
E2100117-002	50WW14-210128-FD	Ground Water	01/28/21 0750	**IV**
E2100117-003	50WW13-210128	Ground Water	01/28/21 0850	**IV**
E2100117-004	50WW11-210128	Ground Water	01/28/21 0945	**IV**
E2100117-005	50WW06-210128	Ground Water	01/28/21 1035	**IV**
E2100117-006	50WW12-210128	Ground Water	01/28/21 1130	**IV**

Service Request Summary

Folder #: **E2100117**
Client Name: ALS Environmental - US
Project Name: HS21011150
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: 01/29/21
Internal Due Date: 2/12/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21011150
EDD: No EDD Specified

8 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved
Location: EHRMS-WIC 4A
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	2	MS/MSD
Semivoa GCMS	ClO4 DOD/6850	5	II Due 2/12, IV due 2/19

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	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
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
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
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	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
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:** **15568**

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:	HS21011150
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21011150-01**	**50WW14-210128**	**Groundwater**	**28 Jan 2021 07:50**
	Provide Level II and Level IV reports on a seperate pdf.			12 Feb 2021
2.	**HS21011150-02**	**50WW14-210128-FD**	**Groundwater**	**28 Jan 2021 07:50**
	Provide Level II and Level IV reports on a seperate pdf.			12 Feb 2021
3.	**HS21011150-03**	**50WW13-210128**	**Groundwater**	**28 Jan 2021 08:50**
	Provide Level II and Level IV reports on a seperate pdf.			12 Feb 2021
4.	**HS21011150-04**	**50WW11-210128**	**Groundwater**	**28 Jan 2021 09:45**
	Provide Level II and Level IV reports on a seperate pdf.			12 Feb 2021
5.	**HS21011150-05**	**50WW06-210128**	**Groundwater**	**28 Jan 2021 10:35**
	Provide Level II and Level IV reports on a seperate pdf.			12 Feb 2021
6.	**HS21011150-06**	**50WW12-210128**	**Groundwater**	**28 Jan 2021 11:30**
	Provide Level II and Level IV reports on a seperate pdf.			12 Feb 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS2101150-06 = MS/MSD

QC Level: DOD IV (DoD Data Package)

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15568**

Relinquished By: _____ Date/Time: 11/29/2021

Received By: _____ Date/Time: 11/29/21 1700

Cooler ID(s): _____ Temperature(s): _____

Cooler Receipt Form

ALS Environmental

Project Chemist CG

Client/Project ALS-KI

Thermometer ID IR41

Date/Time Received: 11/29/21 Initials: CG Date/Time Logged in: 11/29/21 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		11/29/21	1204	CG	0.3	X
						☐
						☐
						☐

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

REV01

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#: 373567 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/JRODRIGUEZ **Prep Method:** Method **Prep Date/Time:** 2/1/21 09:04

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100117-001	50WW14-210128	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2100117-002	50WW14-210128-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2100117-003	50WW13-210128	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2100117-004	50WW11-210128	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100117-005	50WW06-210128	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100117-006	50WW12-210128	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100118-001	50WW08-210125	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2100118-002	50WW05-210125	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2100118-003	50WW29-210125	.01	6850/ClO4 DOD			Ground Water	10mL	
10	EQ2100046-01	MB		6850/ClO4 DOD			Liquid	10mL	
11	EQ2100046-02	LCS		6850/ClO4 DOD			Liquid	10mL	
12	EQ2100046-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
13	EQ2100046-04	50WW12-210128 MS	.02	6850/ClO4 DOD			Liquid	10mL	
14	EQ2100046-05	50WW12-210128 DMS	.03	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100046-02	1.00µL	EQ2100046-03	1.00µL	EQ2100046-04	1.00µL	EQ2100046-05	1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100117-001	100.00µL	E2100117-002	100.00µL	E2100117-003	100.00µL	E2100117-004	100.00µL	E2100117-005	100.00µL	E2100117-006	100.00µL
E2100117-006.R	100.00µL	E2100118-001	100.00µL	E2100118-002	100.00µL	E2100118-003	100.00µL	EQ2100046-01	100.00µL	EQ2100046-02	100.00µL
EQ2100046-03	100.00µL	EQ2100046-04	100.00µL	EQ2100046-05	100.00µL						

Preparation Steps

Step: Preparation
Started: 2/1/21 09:04
Finished: 2/1/21 09:29
By: GRIVERA
Comments

Comments: _____

Preparation Information Benchsheet

Prep Run#: 373567
Team: Semivoa GCMS/JRODRIGUEZ

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 2/1/21 09:04

Reviewed By: GR Date: 2/1/21

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:**	E2100117
Project:	HS21011150	**Date Collected:**	1/28/21 0750
Sample Matrix:	Ground Water	**Date Received:**	1/29/21
Sample Name:	50WW14-210128	**Units:**	µg/L
Lab Code:	E2100117-001	**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	0.500	0.250	0.125	5	2/ 1/21	2/2/21 13:15	373567	711866	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Collected:**	1/28/21 0750
Sample Matrix:	Ground Water	**Date Received:**	1/29/21
Sample Name:	50WW14-210128-FD	**Units:**	µg/L
Lab Code:	E2100117-002	**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	2/ 1/21	2/2/21 13:23	373567	711866	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Collected:**	1/28/21 0850
Sample Matrix:	Ground Water	**Date Received:**	1/29/21
Sample Name:	50WW13-210128	**Units:**	µg/L
Lab Code:	E2100117-003	**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	**155**		1.00	0.500	0.250	10	2/ 1/21	2/2/21 13:31	373567	711866	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Collected:**	1/28/21 0945
Sample Matrix:	Ground Water	**Date Received:**	1/29/21
Sample Name:	50WW11-210128	**Units:**	µg/L
Lab Code:	E2100117-004	**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	**651**		2.00	1.00	0.500	20	2/ 1/21	2/2/21 13:38	373567	711866	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Collected:**	1/28/21 1035
Sample Matrix:	Ground Water	**Date Received:**	1/29/21
Sample Name:	50WW06-210128	**Units:**	µg/L
Lab Code:	E2100117-005	**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	**2.78**		0.100	0.0500	0.0250	1	2/ 1/21	2/2/21 12:43	373567	711866	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Collected:**	1/28/21 1130
Sample Matrix:	Ground Water	**Date Received:**	1/29/21
Sample Name:	50WW12-210128	**Units:**	µg/L
Lab Code:	E2100117-006	**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	**83800**		200	100	50.0	2000	2/ 1/21	2/2/21 13:54	373567	711866	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100046-01	**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	2/ 1/21	2/2/21 12:28	373567	711866	

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: HS21011150
Sample Matrix: Ground Water

Service Request: E2100117
Date Analyzed: 2/ 2/21

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: 373567

	Lab Control Sample EQ2100046-02			Duplicate Lab Control Sample EQ2100046-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0908	0.100	91	0.101	0.100	101	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:**	E2100117
Project:	HS21011150	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100046-02	**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	**0.0908**	J	0.100	0.0500	0.0250	1	2/ 1/21	2/2/21 14:36	373567	711866	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100046-03	**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	**0.101**		0.100	0.0500	0.0250	1	2/ 1/21	2/2/21 12:35	373567	711866	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Collected:**	1/28/21
Sample Matrix:	Ground Water	**Date Received:**	1/29/21
		Date Analyzed:	2/ 1/21

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	50WW12-210128	**Units:**	µg/L
Lab Code:	E2100117-006	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		50WW12-210128MS				50WW12-210128DMS					
		Matrix Spike				**Duplicate Matrix Spike**					
		EQ2100046-04				EQ2100046-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	83800	60800	0.100	-23007600 #	60700	0.100	-23094888#	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:**	E2100117
Project:	HS21011150	**Date Collected:**	1/28/21 1130
Sample Matrix:	Ground Water	**Date Received:**	1/29/21
Sample Name:	50WW12-210128	**Units:**	µg/L
Lab Code:	EQ2100046-04	**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	**60800**	E	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 18:36	373567	711817	*

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Collected:**	1/28/21 1130
Sample Matrix:	Ground Water	**Date Received:**	1/29/21
Sample Name:	50WW12-210128	**Units:**	µg/L
Lab Code:	EQ2100046-05	**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	**60700**	E	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 18:44	373567	711817	*

Initial Calibration

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20210201

ALS Environmental

ICAL Date: 2/1/2021
Cal. Std. xp: 5/20/2021
ICAL ID: **EC2100003**

1st Review: Grivera
2nd Review: Kneir

Injection Log
LCMS01 -Shimadzu 8050

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	PERCHLORATE1		20210201_010	Perchlorate6850b.lcm	1x	☒	3100808-05	2/1/2021 12:31
2	PERCHLORATE2		20210201_011	Perchlorate6850b.lcm	1x	☒	3100808-06	2/1/2021 12:39
3	PERCHLORATE3		20210201_012	Perchlorate6850b.lcm	1x	☒	3100808-07	2/1/2021 12:47
4	PERCHLORATE4		20210201_013	Perchlorate6850b.lcm	1x	☒	3100808-08	2/1/2021 12:54
5	PERCHLORATE5		20210201_014	Perchlorate6850b.lcm	1x	☒	3100808-09	2/1/2021 13:02
6	PERCHLORATE6		20210201_015	Perchlorate6850b.lcm	1x	☒	3100809-01	2/1/2021 13:10
7	PERCHLORATE7		20210201_016	Perchlorate6850b.lcm	1x	☒	3100809-02	2/1/2021 13:18
8	PERCHLORATE8		20210201_017	Perchlorate6850b.lcm	1x	☒	3100809-03	2/1/2021 13:26
9	PERCHLORATE9		20210201_018	Perchlorate6850b.lcm	1x	☒	3100809-04	2/1/2021 13:34
10	PERCHLORATE10		20210201_019	Perchlorate6850b.lcm	1x	☒	3100809-05	2/1/2021 13:42
11	ICS		20210201_020	Perchlorate6850b.lcm	1x	☒		2/1/2021 13:50
12	LODV		20210201_021	Perchlorate6850b.lcm	1x	☒		2/1/2021 13:58
13	PERCHLORATEICV		20210201_022	Perchlorate6850b.lcm	1x	☒	3100809-06	2/1/2021 14:06
14	EQ2100045-01		20210201_023	Perchlorate6850b.lcm	1x	☒		2/1/2021 14:14
15	EQ2100045-02		20210201_024	Perchlorate6850b.lcm	1x	☒		2/1/2021 14:21
16	EQ2100045-03		20210201_025	Perchlorate6850b.lcm	1x	☒		2/1/2021 14:29
17	EQ2100045-04		20210201_026	Perchlorate6850b.lcm	1x	☒		2/1/2021 14:37
18	EQ2100045-05		20210201_027	Perchlorate6850b.lcm	1x	☒		2/1/2021 14:45
19	EQ2100045-06		20210201_028	Perchlorate6850b.lcm	1x	☒		2/1/2021 14:53
20	EQ2100045-07		20210201_029	Perchlorate6850b.lcm	1x	☒		2/1/2021 15:01
21	E2100103-001		20210201_030	Perchlorate6850b.lcm	1x	☒		2/1/2021 15:09
22	E2100103-002		20210201_031	Perchlorate6850b.lcm	1x	☒		2/1/2021 15:17
23	E2100103-003		20210201_032	Perchlorate6850b.lcm	1x	☒		2/1/2021 15:25
24	PERCHLORATE7		20210201_033	Perchlorate6850b.lcm	1x	☒	3100809-02	2/1/2021 15:32
25	E2100103-004		20210201_034	Perchlorate6850b.lcm	1x	☒		2/1/2021 15:40
26	E2100103-005		20210201_035	Perchlorate6850b.lcm	1x	☒		2/1/2021 15:48
27	E2100103-006		20210201_036	Perchlorate6850b.lcm	1x	☒		2/1/2021 15:56
28	E2100105-001		20210201_037	Perchlorate6850b.lcm	1x	☒		2/1/2021 16:04
29	E2100106-001		20210201_038	Perchlorate6850b.lcm	1x	☒		2/1/2021 16:12
30	E2100106-002		20210201_039	Perchlorate6850b.lcm	1x	☒		2/1/2021 16:20
31	E2100106-003		20210201_040	Perchlorate6850b.lcm	1x	☒		2/1/2021 16:46
32	E2100106-004		20210201_041	Perchlorate6850b.lcm	1x	☒		2/1/2021 16:54
33	E2100106-005		20210201_042	Perchlorate6850b.lcm	1x	☒		2/1/2021 17:02
34	E2100106-006		20210201_043	Perchlorate6850b.lcm	1x	☒		2/1/2021 17:10
35	PERCHLORATE7		20210201_044	Perchlorate6850b.lcm	1x	☒	3100809-02	2/1/2021 17:17
36	E2100107-001		20210201_045	Perchlorate6850b.lcm	1x	☒		2/1/2021 17:25
37	PERCHLORATE7		20210201_046	Perchlorate6850b.lcm	1x	☒	3100809-02	2/1/2021 17:33
38	10um filter test_MB		20210201_047	Perchlorate6850b.lcm	1x	☒		2/1/2021 17:41
39	10um filter test_LCS		20210201_048	Perchlorate6850b.lcm	1x	☒		2/1/2021 17:49
40	E2100107-002-10um		20210201_049	Perchlorate6850b.lcm	1x	☒		2/1/2021 17:57
41	PERCHLORATE7		20210201_050	Perchlorate6850b.lcm	1x	☒	3100809-02	2/1/2021 18:05
42	EQ2100046-01		20210201_051	Perchlorate6850b.lcm	1x	☒		2/1/2021 18:13
43	EQ2100046-02		20210201_052	Perchlorate6850b.lcm	1x	☒		2/1/2021 18:20
44	EQ2100046-03		20210201_053	Perchlorate6850b.lcm	1x	☒		2/1/2021 18:28
45	EQ2100046-04		20210201_054	Perchlorate6850b.lcm	1x	☒		2/1/2021 18:36
46	EQ2100046-05		20210201_055	Perchlorate6850b.lcm	1x	☒		2/1/2021 18:44
47	E2100117-001		20210201_056	Perchlorate6850b.lcm	1x	☒		2/1/2021 18:52
48	E2100117-002		20210201_057	Perchlorate6850b.lcm	1x	☒		2/1/2021 19:00
49	E2100117-003		20210201_058	Perchlorate6850b.lcm	1x	☒		2/1/2021 19:08
50	E2100117-004		20210201_059	Perchlorate6850b.lcm	1x	☒		2/1/2021 19:16
51	E2100117-005		20210201_060	Perchlorate6850b.lcm	1x	☒		2/1/2021 19:24
52	PERCHLORATE7		20210201_061	Perchlorate6850b.lcm	1x	☒	3100809-02	2/1/2021 19:31
53	E2100117-006		20210201_062	Perchlorate6850b.lcm	1x	☒		2/1/2021 19:39
54	E2100118-001		20210201_063	Perchlorate6850b.lcm	1x	☒		2/1/2021 19:47
55	E2100118-002		20210201_064	Perchlorate6850b.lcm	1x	☒		2/1/2021 19:55
56	E2100118-003		20210201_065	Perchlorate6850b.lcm	1x	☒		2/1/2021 20:03
57	PERCHLORATE7		20210201_066	Perchlorate6850b.lcm	1x	☒	3100809-02	2/1/2021 20:11
58								
59								
60								

Initial Calibration - Detailed Report

Calibration ID: EC2100003 **Instrument ID:** E-LCMS-01
Column Name: 1

#	Lab Code	Sample Name	File Location	Aquisition Date
01	EC2100003-01	PERCHLORATE1	20210201_010	02/01/2021 12:31
02	EC2100003-02	PERCHLORATE2	20210201_011	02/01/2021 12:39
03	EC2100003-03	PERCHLORATE3	20210201_012	02/01/2021 12:47
04	EC2100003-04	PERCHLORATE4	20210201_013	02/01/2021 12:54
05	EC2100003-05	PERCHLORATE5	20210201_014	02/01/2021 13:02
06	EC2100003-06	PERCHLORATE6	20210201_015	02/01/2021 13:10
07	EC2100003-07	PERCHLORATE7	20210201_016	02/01/2021 13:18
08	EC2100003-08	PERCHLORATE8	20210201_017	02/01/2021 13:26
09	EC2100003-09	PERCHLORATE9	20210201_018	02/01/2021 13:34
10	EC2100003-10	PERCHLORATE10	20210201_019	02/01/2021 13:42

Analyte	Curve Fit	Weighting		
Perchlorate	**Linear**	**Equal**	**R2 = 0.9998013640904140**	**Y=0.1191 X+0.02779**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.1000	0.1437	02	0.5000	0.1378	03	0.7000	0.1352	04	1.0000	0.1308
05	2.0000	0.1376	06	5.0000	0.1256	07	10.0000	0.1256	08	20.0000	0.122
09	30.0000	0.1213	10	50.0000	0.1188						

Analyte

Perchlorate

#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D
01	0.1000	-0.113	**-212.7**	02	0.5000	0.345	**-31.0**	03	0.7000	0.561	-19.8
04	1.0000	0.865	-13.5	05	2.0000	2.08	3.9	06	5.0000	5.04	0.7
07	10.0000	10.3	3.1	08	20.0000	20.3	1.3	09	30.0000	30.3	1.0
10	50.0000	49.6	-0.7								

Initial Calibration Verification Summary Report

Calibration ID:	EC2100003	**Instrument ID:**	E-LCMS-01
Datafile ID:	20210201_022	**Column Name:**	1

Analyte	Lab Code	Type	Curve Fit	True Value	Calc Conc	Units	Result	Criteria
Perchlorate	EC2100003-11	T	Linear	10	9.837	ng/mL	-1.6	<= 15

ALS Group Houston

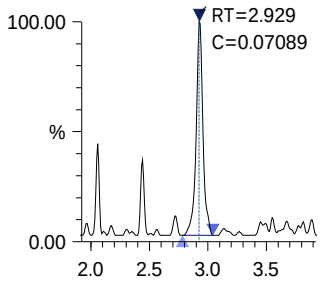
PERCHLORATE1

Sample ID: PERCHLORATE1
Date acquired: 2/1/2021 12:31:14 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210201\20210201_010.lcd
Vial: 22 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE1	2/1/2021 12:31:14 PM	1187	0.07089	20210201_010	2.929	25.0000	1.0000	22
Sodium Perchlorate-18O4_IS	PERCHLORATE1	2/1/2021 12:31:14 PM	82617	1.00000	20210201_010	2.924	25.0000	1.0000	22

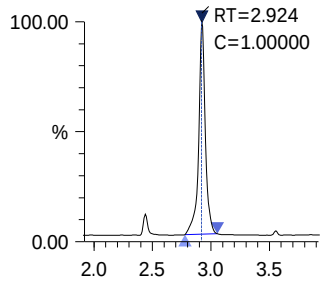
Perchlorate

Conc 0.07089
Area 1187
Q 99.00>83.00 (-) 2.89e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 82617
ISTD 107.00>89.00 (-) 2.10e4



ALS Group Houston

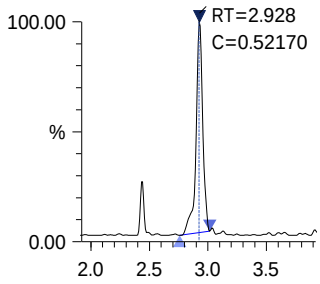
PERCHLORATE2

Sample ID: PERCHLORATE2
Date acquired: 2/1/2021 12:39:09 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210201\20210201_011.lcd
Vial: 23 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE2	2/1/2021 12:39:09 PM	5955	0.52170	20210201_011	2.928	25.0000	1.0000	23
Sodium Perchlorate-18O4_IS	PERCHLORATE2	2/1/2021 12:39:09 PM	86423	1.00000	20210201_011	2.924	25.0000	1.0000	23

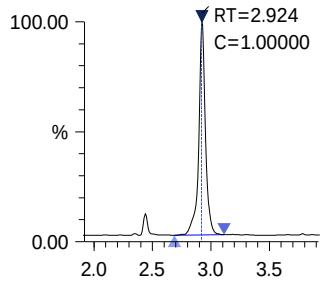
Perchlorate

Conc 0.52170
Area 5955
Q 99.00>83.00 (-) 1.49e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 86423
ISTD 107.00>89.00 (-) 2.15e4



ALS Group Houston

PERCHLORATE3

Sample ID: PERCHLORATE3
Date acquired: 2/1/2021 12:47:03 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210201\20210201_012.lcd
Vial: 24 | Inj. Volume: 25.0000uL | Tray: 1

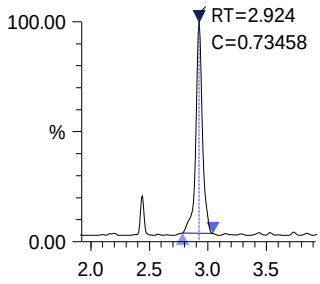
Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE3	2/1/2021 12:47:03 PM	8132	0.73458	20210201_012	2.924	25.0000	1.0000	24
Sodium Perchlorate-18O4_IS	PERCHLORATE3	2/1/2021 12:47:03 PM	85914	1.00000	20210201_012	2.923	25.0000	1.0000	24

Perchlorate

Conc 0.73458

Area 8132

Q 99.00>83.00 (-) 2.06e3

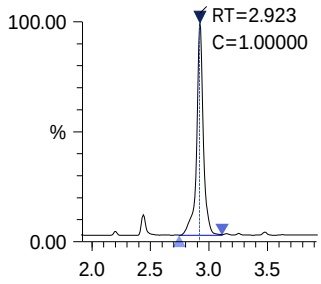


Sodium Perchlorate-18O4_IS

Conc 1.00000

Area 85914

ISTD 107.00>89.00 (-) 2.16e4



ALS Group Houston

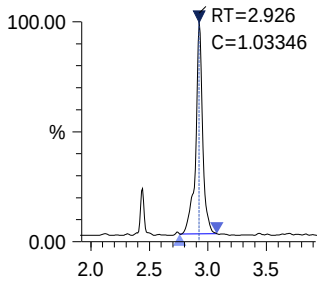
PERCHLORATE4

Sample ID: PERCHLORATE4
Date acquired: 2/1/2021 12:54:57 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210201\20210201_013.lcd
Vial: 25 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE4	2/1/2021 12:54:57 PM	10926	1.03346	20210201_013	2.926	25.0000	1.0000	25
Sodium Perchlorate-18O4_IS	PERCHLORATE4	2/1/2021 12:54:57 PM	83522	1.00000	20210201_013	2.925	25.0000	1.0000	25

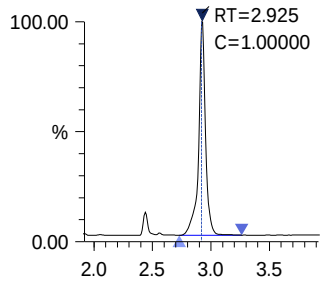
Perchlorate

Conc 1.03346
Area 10926
Q 99.00>83.00 (-) 2.67e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 83522
ISTD 107.00>89.00 (-) 2.02e4



ALS Group Houston

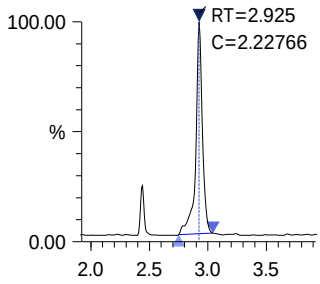
PERCHLORATE5

Sample ID: PERCHLORATE5
Date acquired: 2/1/2021 1:02:54 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210201\20210201_014.lcd
Vial: 26 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE5	2/1/2021 1:02:54 PM	22093	2.22766	20210201_014	2.925	25.0000	1.0000	26
Sodium Perchlorate-18O4_IS	PERCHLORATE5	2/1/2021 1:02:54 PM	80254	1.00000	20210201_014	2.924	25.0000	1.0000	26

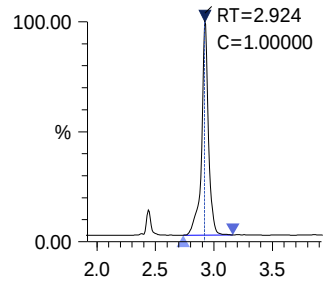
Perchlorate

Conc 2.22766
Area 22093
Q 99.00>83.00 (-) 5.61e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 80254
ISTD 107.00>89.00 (-) 1.96e4



ALS Group Houston

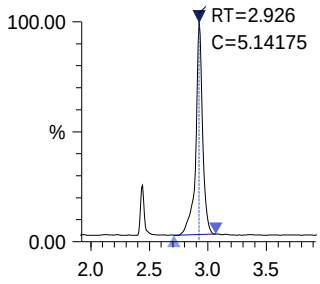
PERCHLORATE6

Sample ID: PERCHLORATE6
Date acquired: 2/1/2021 1:10:49 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210201\20210201_015.lcd
Vial: 27 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE6	2/1/2021 1:10:49 PM	48547	5.14175	20210201_015	2.926	25.0000	1.0000	27
Sodium Perchlorate-18O4_IS	PERCHLORATE6	2/1/2021 1:10:49 PM	77326	1.00000	20210201_015	2.925	25.0000	1.0000	27

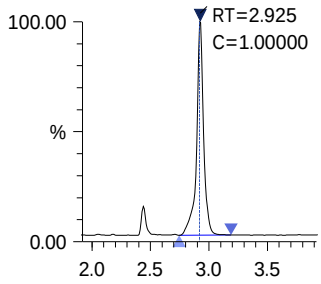
Perchlorate

Conc 5.14175
Area 48547
Q 99.00>83.00 (-) 1.20e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 77326
ISTD 107.00>89.00 (-) 1.84e4



ALS Group Houston

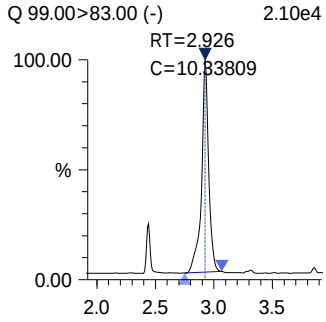
PERCHLORATE7

Sample ID: PERCHLORATE7
Date acquired: 2/1/2021 1:18:41 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210201\20210201_016.lcd
Vial: 21 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	2/1/2021 1:18:41 PM	88831	10.33809	20210201_016	2.926	25.0000	1.0000	21
Sodium Perchlorate-18O4_IS	PERCHLORATE7	2/1/2021 1:18:41 PM	70700	1.00000	20210201_016	2.924	25.0000	1.0000	21

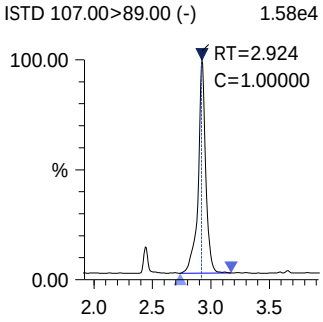
Perchlorate

Conc 10.33809
Area 88831



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 70700



ALS Group Houston

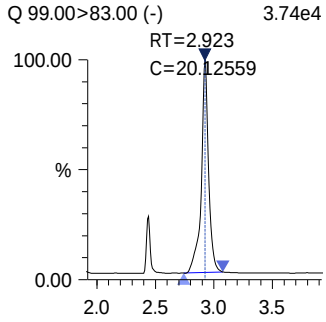
PERCHLORATE8

Sample ID: PERCHLORATE8
Date acquired: 2/1/2021 1:26:37 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210201\20210201_017.lcd
Vial: 28 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE8	2/1/2021 1:26:37 PM	161822	20.12559	20210201_017	2.923	25.0000	1.0000	28
Sodium Perchlorate-18O4_IS	PERCHLORATE8	2/1/2021 1:26:37 PM	66306	1.00000	20210201_017	2.923	25.0000	1.0000	28

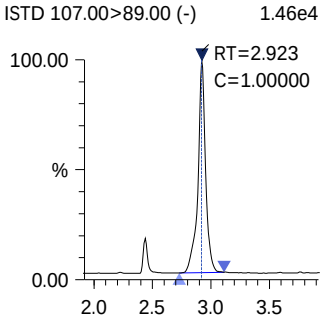
Perchlorate

Conc 20.12559
Area 161822



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 66306



ALS Group Houston

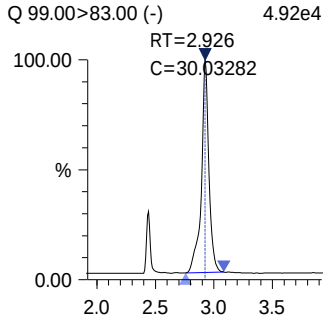
PERCHLORATE9

Sample ID: PERCHLORATE9
Date acquired: 2/1/2021 1:34:33 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210201\20210201_018.lcd
Vial: 29 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE9	2/1/2021 1:34:33 PM	219142	30.03282	20210201_018	2.926	25.0000	1.0000	29
Sodium Perchlorate-18O4_IS	PERCHLORATE9	2/1/2021 1:34:33 PM	60219	1.00000	20210201_018	2.925	25.0000	1.0000	29

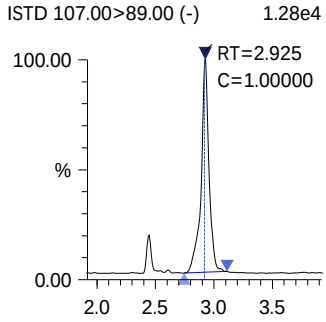
Perchlorate

Conc 30.03282
Area 219142



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 60219



ALS Group Houston

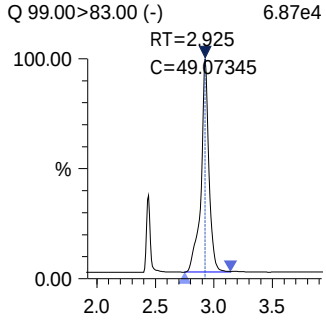
PERCHLORATE10

Sample ID: PERCHLORATE10
Date acquired: 2/1/2021 1:42:25 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210201\20210201_019.lcd
Vial: 30 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE10	2/1/2021 1:42:25 PM	323140	49.07345	20210201_019	2.925	25.0000	1.0000	30
Sodium Perchlorate-18O4_IS	PERCHLORATE10	2/1/2021 1:42:25 PM	54378	1.00000	20210201_019	2.923	25.0000	1.0000	30

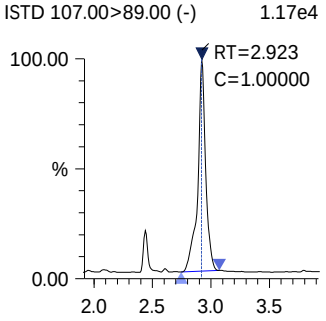
Perchlorate

Conc 49.07345
Area 323140



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 54378



ALS Group Houston

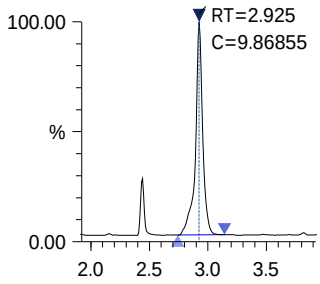
PERCHLORATEICV

Sample ID: PERCHLORATEICV
Date acquired: 2/1/2021 2:06:09 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210201\20210201_022.lcd
Vial: 31 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATEICV	2/1/2021 2:06:09 PM	91977	9.86855	20210201_022	2.925	25.0000	1.0000	31
Sodium Perchlorate-18O4_IS	PERCHLORATEICV	2/1/2021 2:06:09 PM	76670	1.00000	20210201_022	2.924	25.0000	1.0000	31

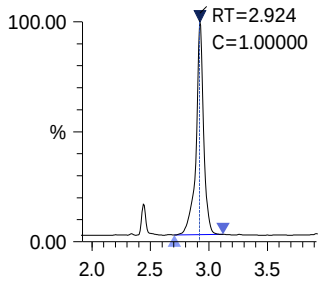
Perchlorate

Conc 9.86855
Area 91977
Q 99.00>83.00 (-) 2.13e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 76670
ISTD 107.00>89.00 (-) 1.71e4



Chromatograms and Selected Ion Monitoring

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 320, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20210201

ALS Environmental

ICAL Date: 2/1/2021
Cal. Std. xp: 5/20/2021
ICAL ID: **EC2100003**

1st Review: Grivera
2nd Review: Kneir

Injection Log
LCMS01 -Shimadzu 8050

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	PERCHLORATE1		20210201_010	Perchlorate6850b.lcm	1x	☒	3100808-05	2/1/2021 12:31
2	PERCHLORATE2		20210201_011	Perchlorate6850b.lcm	1x	☒	3100808-06	2/1/2021 12:39
3	PERCHLORATE3		20210201_012	Perchlorate6850b.lcm	1x	☒	3100808-07	2/1/2021 12:47
4	PERCHLORATE4		20210201_013	Perchlorate6850b.lcm	1x	☒	3100808-08	2/1/2021 12:54
5	PERCHLORATE5		20210201_014	Perchlorate6850b.lcm	1x	☒	3100808-09	2/1/2021 13:02
6	PERCHLORATE6		20210201_015	Perchlorate6850b.lcm	1x	☒	3100809-01	2/1/2021 13:10
7	PERCHLORATE7		20210201_016	Perchlorate6850b.lcm	1x	☒	3100809-02	2/1/2021 13:18
8	PERCHLORATE8		20210201_017	Perchlorate6850b.lcm	1x	☒	3100809-03	2/1/2021 13:26
9	PERCHLORATE9		20210201_018	Perchlorate6850b.lcm	1x	☒	3100809-04	2/1/2021 13:34
10	PERCHLORATE10		20210201_019	Perchlorate6850b.lcm	1x	☒	3100809-05	2/1/2021 13:42
11	ICS		20210201_020	Perchlorate6850b.lcm	1x	☒		2/1/2021 13:50
12	LODV		20210201_021	Perchlorate6850b.lcm	1x	☒		2/1/2021 13:58
13	PERCHLORATEICV		20210201_022	Perchlorate6850b.lcm	1x	☒	3100809-06	2/1/2021 14:06
14	EQ2100045-01		20210201_023	Perchlorate6850b.lcm	1x	☒		2/1/2021 14:14
15	EQ2100045-02		20210201_024	Perchlorate6850b.lcm	1x	☒		2/1/2021 14:21
16	EQ2100045-03		20210201_025	Perchlorate6850b.lcm	1x	☒		2/1/2021 14:29
17	EQ2100045-04		20210201_026	Perchlorate6850b.lcm	1x	☒		2/1/2021 14:37
18	EQ2100045-05		20210201_027	Perchlorate6850b.lcm	1x	☒		2/1/2021 14:45
19	EQ2100045-06		20210201_028	Perchlorate6850b.lcm	1x	☒		2/1/2021 14:53
20	EQ2100045-07		20210201_029	Perchlorate6850b.lcm	1x	☒		2/1/2021 15:01
21	E2100103-001		20210201_030	Perchlorate6850b.lcm	1x	☒		2/1/2021 15:09
22	E2100103-002		20210201_031	Perchlorate6850b.lcm	1x	☒		2/1/2021 15:17
23	E2100103-003		20210201_032	Perchlorate6850b.lcm	1x	☒		2/1/2021 15:25
24	PERCHLORATE7		20210201_033	Perchlorate6850b.lcm	1x	☒	3100809-02	2/1/2021 15:32
25	E2100103-004		20210201_034	Perchlorate6850b.lcm	1x	☒		2/1/2021 15:40
26	E2100103-005		20210201_035	Perchlorate6850b.lcm	1x	☒		2/1/2021 15:48
27	E2100103-006		20210201_036	Perchlorate6850b.lcm	1x	☒		2/1/2021 15:56
28	E2100105-001		20210201_037	Perchlorate6850b.lcm	1x	☒		2/1/2021 16:04
29	E2100106-001		20210201_038	Perchlorate6850b.lcm	1x	☒		2/1/2021 16:12
30	E2100106-002		20210201_039	Perchlorate6850b.lcm	1x	☒		2/1/2021 16:20
31	E2100106-003		20210201_040	Perchlorate6850b.lcm	1x	☒		2/1/2021 16:46
32	E2100106-004		20210201_041	Perchlorate6850b.lcm	1x	☒		2/1/2021 16:54
33	E2100106-005		20210201_042	Perchlorate6850b.lcm	1x	☒		2/1/2021 17:02
34	E2100106-006		20210201_043	Perchlorate6850b.lcm	1x	☒		2/1/2021 17:10
35	PERCHLORATE7		20210201_044	Perchlorate6850b.lcm	1x	☒	3100809-02	2/1/2021 17:17
36	E2100107-001		20210201_045	Perchlorate6850b.lcm	1x	☒		2/1/2021 17:25
37	PERCHLORATE7		20210201_046	Perchlorate6850b.lcm	1x	☒	3100809-02	2/1/2021 17:33
38	10um filter test_MB		20210201_047	Perchlorate6850b.lcm	1x	☒		2/1/2021 17:41
39	10um filter test_LCS		20210201_048	Perchlorate6850b.lcm	1x	☒		2/1/2021 17:49
40	E2100107-002-10um		20210201_049	Perchlorate6850b.lcm	1x	☒		2/1/2021 17:57
41	PERCHLORATE7		20210201_050	Perchlorate6850b.lcm	1x	☒	3100809-02	2/1/2021 18:05
42	EQ2100046-01		20210201_051	Perchlorate6850b.lcm	1x	☒		2/1/2021 18:13
43	EQ2100046-02		20210201_052	Perchlorate6850b.lcm	1x	☒		2/1/2021 18:20
44	EQ2100046-03		20210201_053	Perchlorate6850b.lcm	1x	☒		2/1/2021 18:28
45	EQ2100046-04		20210201_054	Perchlorate6850b.lcm	1x	☒		2/1/2021 18:36
46	EQ2100046-05		20210201_055	Perchlorate6850b.lcm	1x	☒		2/1/2021 18:44
47	E2100117-001		20210201_056	Perchlorate6850b.lcm	1x	☒		2/1/2021 18:52
48	E2100117-002		20210201_057	Perchlorate6850b.lcm	1x	☒		2/1/2021 19:00
49	E2100117-003		20210201_058	Perchlorate6850b.lcm	1x	☒		2/1/2021 19:08
50	E2100117-004		20210201_059	Perchlorate6850b.lcm	1x	☒		2/1/2021 19:16
51	E2100117-005		20210201_060	Perchlorate6850b.lcm	1x	☒		2/1/2021 19:24
52	PERCHLORATE7		20210201_061	Perchlorate6850b.lcm	1x	☒	3100809-02	2/1/2021 19:31
53	E2100117-006		20210201_062	Perchlorate6850b.lcm	1x	☒		2/1/2021 19:39
54	E2100118-001		20210201_063	Perchlorate6850b.lcm	1x	☒		2/1/2021 19:47
55	E2100118-002		20210201_064	Perchlorate6850b.lcm	1x	☒		2/1/2021 19:55
56	E2100118-003		20210201_065	Perchlorate6850b.lcm	1x	☒		2/1/2021 20:03
57	PERCHLORATE7		20210201_066	Perchlorate6850b.lcm	1x	☒	3100809-02	2/1/2021 20:11
58								
59								
60								

20210202

ALS Environmental

ICAL Date: 2/1/2021
Cal. Std. xp: 5/20/2021
ICAL ID: **EC2100003**

1st Review: Grivera
2nd Review: Kneir

Injection Log
LCMS01 -Shimadzu 8050

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	null		20210202_001	Perchlorate6850b.lcm	1x	☒		2/2/2021 9:17
2	null		20210202_002	Perchlorate6850b.lcm	1x	☒		2/2/2021 9:22
3	IB		20210202_003	Perchlorate6850b.lcm	1x	☒		2/2/2021 9:27
4	IB		20210202_004	Perchlorate6850b.lcm	1x	☒		2/2/2021 9:35
5	ICS		20210202_005	Perchlorate6850b.lcm	1x	☒		2/2/2021 9:43
6	LODV		20210202_006	Perchlorate6850b.lcm	1x	☒		2/2/2021 9:51
7	PERCHLORATE7		20210202_007	Perchlorate6850b.lcm	1x	☒	3100809-02	2/2/2021 9:59
8	EQ2100045-04X10		20210202_008	Perchlorate6850b.lcm	10X	☒		2/2/2021 10:21
9	EQ2100045-05X10		20210202_009	Perchlorate6850b.lcm	10X	☒		2/2/2021 10:29
10	EQ2100045-06X10		20210202_010	Perchlorate6850b.lcm	10X	☒		2/2/2021 10:37
11	EQ2100045-07X10		20210202_011	Perchlorate6850b.lcm	10X	☒		2/2/2021 10:45
12	E2100103-001X10		20210202_012	Perchlorate6850b.lcm	10X	☒		2/2/2021 10:53
13	E2100103-002X10		20210202_013	Perchlorate6850b.lcm	10X	☒		2/2/2021 11:01
14	E2100103-003X10		20210202_014	Perchlorate6850b.lcm	10X	☒		2/2/2021 11:08
15	E2100103-004X10		20210202_015	Perchlorate6850b.lcm	10X	☒		2/2/2021 11:16
16	E2100103-005X10		20210202_016	Perchlorate6850b.lcm	10X	☒		2/2/2021 11:24
17	E2100103-006X5		20210202_017	Perchlorate6850b.lcm	5X	☒		2/2/2021 11:32
18	PERCHLORATE7		20210202_018	Perchlorate6850b.lcm	1x	☒	3100809-02	2/2/2021 11:40
19	E2100105-001X5		20210202_019	Perchlorate6850b.lcm	5X	☒		2/2/2021 11:48
20	E2100106-001X10		20210202_020	Perchlorate6850b.lcm	10X	☒		2/2/2021 11:56
21	E2100106-004X5		20210202_021	Perchlorate6850b.lcm	5X	☒		2/2/2021 12:04
22	E2100106-005X10		20210202_022	Perchlorate6850b.lcm	10X	☒		2/2/2021 12:12
23	PERCHLORATE7		20210202_023	Perchlorate6850b.lcm	1x	☒	3100809-02	2/2/2021 12:20
24	EQ2100046-01		20210202_024	Perchlorate6850b.lcm	1x	☒		2/2/2021 12:28
25	EQ2100046-03		20210202_025	Perchlorate6850b.lcm	1x	☒		2/2/2021 12:35
26	E2100117-005		20210202_026	Perchlorate6850b.lcm	1x	☒		2/2/2021 12:43
27	E2100118-002		20210202_027	Perchlorate6850b.lcm	1x	☒		2/2/2021 12:51
28	EQ2100046-04X2000		20210202_028	Perchlorate6850b.lcm	2000X	☒		2/2/2021 12:59
29	EQ2100046-05X2000		20210202_029	Perchlorate6850b.lcm	2000X	☒		2/2/2021 13:07
30	E2100117-001X5		20210202_030	Perchlorate6850b.lcm	5X	☒		2/2/2021 13:15
31	E2100117-002X5		20210202_031	Perchlorate6850b.lcm	5X	☒		2/2/2021 13:23
32	E2100117-003X10		20210202_032	Perchlorate6850b.lcm	10X	☒		2/2/2021 13:31
33	E2100117-004X20		20210202_033	Perchlorate6850b.lcm	20X	☒		2/2/2021 13:38
34	PERCHLORATE7		20210202_034	Perchlorate6850b.lcm	1x	☒	3100809-02	2/2/2021 13:46
35	E2100117-006X2000		20210202_035	Perchlorate6850b.lcm	2000X	☒		2/2/2021 13:54
36	E2100118-001X10		20210202_036	Perchlorate6850b.lcm	10X	☒		2/2/2021 14:02
37	E2100118-003X10		20210202_037	Perchlorate6850b.lcm	10X	☒		2/2/2021 14:28
38	EQ2100046-02		20210202_038	Perchlorate6850b.lcm	1x	☒		2/2/2021 14:36
39	PERCHLORATE7		20210202_040	Perchlorate6850b.lcm	1x	☒	3100809-02	2/2/2021 14:51
40								

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21011150

Service Request: E2100117
Date Analyzed: 2/ 1/21

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20210201\20210201_022

Calibration Date: 2/1/21
Calibration ID: EC2100003
Analysis Lot: 711817
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.87	NA	NA	NA	-1.3	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21011150

Service Request: E2100117
Date Analyzed: 2/ 1/21

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20210201\20210201_033

Calibration Date: 2/1/21
Calibration ID: EC2100003
Analysis Lot: 711817
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.0	NA	NA	NA	0.0	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21011150

Service Request: E2100117
Date Analyzed: 2/ 1/21

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20210201\20210201_044

Calibration Date: 2/1/21
Calibration ID: EC2100003
Analysis Lot: 711817
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.2	NA	NA	NA	2.4	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21011150

Service Request: E2100117
Date Analyzed: 2/ 1/21

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20210201\20210201_046

Calibration Date: 2/1/21
Calibration ID: EC2100003
Analysis Lot: 711817
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.1	NA	NA	NA	1.1	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21011150

Service Request: E2100117
Date Analyzed: 2/ 1/21

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20210201\20210201_050

Calibration Date: 2/1/21
Calibration ID: EC2100003
Analysis Lot: 711817
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.2	NA	NA	NA	2.0	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21011150

Service Request: E2100117
Date Analyzed: 2/ 1/21

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20210201\20210201_061

Calibration Date: 2/1/21
Calibration ID: EC2100003
Analysis Lot: 711817
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.1	NA	NA	NA	1.1	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21011150

Service Request: E2100117
Date Analyzed: 2/ 1/21

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20210201\20210201_066

Calibration Date: 2/1/21
Calibration ID: EC2100003
Analysis Lot: 711817
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.2	NA	NA	NA	2.4	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21011150

Service Request: E2100117
Date Analyzed: 2/ 2/21

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20210202\20210202_007

Calibration Date: 2/1/21
Calibration ID: EC2100003
Analysis Lot: 711866
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.2	NA	NA	NA	1.5	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21011150

Service Request: E2100117
Date Analyzed: 2/ 2/21

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20210202\20210202_018

Calibration Date: 2/1/21
Calibration ID: EC2100003
Analysis Lot: 711866
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.0	NA	NA	NA	0.1	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21011150

Service Request: E2100117
Date Analyzed: 2/ 2/21

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20210202\20210202_023

Calibration Date: 2/1/21
Calibration ID: EC2100003
Analysis Lot: 711866
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.0	NA	NA	NA	0.1	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21011150

Service Request: E2100117
Date Analyzed: 2/ 2/21

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20210202\20210202_034

Calibration Date: 2/1/21
Calibration ID: EC2100003
Analysis Lot: 711866
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.5	NA	NA	NA	4.9	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS21011150

Service Request: E2100117
Date Analyzed: 2/ 2/21

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20210202\20210202_040

Calibration Date: 2/1/21
Calibration ID: EC2100003
Analysis Lot: 711866
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.8	NA	NA	NA	7.9	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Analyzed:**	2/1/21 14:06

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20210201\20210201_022	**Lab Code:**	EQ2100050-01
Instrument ID:	E-LCMS-01	**Analysis Lot:**	711817
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	74,766	2.92
	Upper Limit ==>	112,149	4.92
	Lower Limit ==>	37,383	0.92
Associated Analyses			
Continuing Calibration Verification	EQ2100050-01	76,670	2.92

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Analyzed:**	2/1/21 15:32

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20210201\20210201_033	**Lab Code:**	EQ2100050-02
Instrument ID:	E-LCMS-01	**Analysis Lot:**	711817
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	74,766	2.92
	Upper Limit ==>	112,149	4.92
	Lower Limit ==>	37,383	0.92
Associated Analyses			
Continuing Calibration Verification	EQ2100050-02	84,606	2.92

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Analyzed:**	2/1/21 17:17

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20210201\20210201_044	**Lab Code:**	EQ2100050-03
Instrument ID:	E-LCMS-01	**Analysis Lot:**	711817
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	74,766	2.92
	Upper Limit ==>	112,149	4.92
	Lower Limit ==>	37,383	0.92
Associated Analyses			
Continuing Calibration Verification	EQ2100050-03	96,176	2.91

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Analyzed:**	2/1/21 17:33

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20210201\20210201_046	**Lab Code:**	EQ2100050-04
Instrument ID:	E-LCMS-01	**Analysis Lot:**	711817
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	74,766	2.92
	Upper Limit ==>	112,149	4.92
	Lower Limit ==>	37,383	0.92
Associated Analyses			
Continuing Calibration Verification	EQ2100050-04	93,090	2.91

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Analyzed:**	2/1/21 18:05

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20210201\20210201_050	**Lab Code:**	EQ2100050-05
Instrument ID:	E-LCMS-01	**Analysis Lot:**	711817
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	74,766	2.92
	Upper Limit ==>	112,149	4.92
	Lower Limit ==>	37,383	0.92
Associated Analyses			
Continuing Calibration Verification	EQ2100050-05	91,090	2.91
50WW12-210128MS	EQ2100046-04	3,421*	2.90
50WW12-210128DMS	EQ2100046-05	3,602*	2.90

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Analyzed:**	2/1/21 19:31

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20210201\20210201_061	**Lab Code:**	EQ2100050-06
Instrument ID:	E-LCMS-01	**Analysis Lot:**	711817
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	74,766	2.92
	Upper Limit ==>	112,149	4.92
	Lower Limit ==>	37,383	0.92
Associated Analyses			
Continuing Calibration Verification	EQ2100050-06	89,502	2.91

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Analyzed:**	2/1/21 20:11

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20210201\20210201_066	**Lab Code:**	EQ2100050-07
Instrument ID:	E-LCMS-01	**Analysis Lot:**	711817
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	74,766	2.92
	Upper Limit ==>	112,149	4.92
	Lower Limit ==>	37,383	0.92
Associated Analyses			
Continuing Calibration Verification	EQ2100050-07	87,785	2.91

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Analyzed:**	2/2/21 09:59

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20210202\20210202_007	**Lab Code:**	EQ2100053-01
Instrument ID:	E-LCMS-01	**Analysis Lot:**	711866
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	74,766	2.92
	Upper Limit ==>	112,149	4.92
	Lower Limit ==>	37,383	0.92
Associated Analyses			
Continuing Calibration Verification	EQ2100053-01	79,418	2.92

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Analyzed:**	2/2/21 11:40

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20210202\20210202_018	**Lab Code:**	EQ2100053-02
Instrument ID:	E-LCMS-01	**Analysis Lot:**	711866
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	74,766	2.92
	Upper Limit ==>	112,149	4.92
	Lower Limit ==>	37,383	0.92
Associated Analyses			
Continuing Calibration Verification	EQ2100053-02	90,764	2.92

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Analyzed:**	2/2/21 12:20

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20210202\20210202_023	**Lab Code:**	EQ2100053-03
Instrument ID:	E-LCMS-01	**Analysis Lot:**	711866
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	74,766	2.92
	Upper Limit ==>	112,149	4.92
	Lower Limit ==>	37,383	0.92
Associated Analyses			
Continuing Calibration Verification	EQ2100053-03	88,929	2.92
Method Blank	EQ2100046-01	96,543	2.90
Duplicate Lab Control Sample	EQ2100046-03	101,522	2.92
50WW06-210128	E2100117-005	78,134	2.92
50WW14-210128	E2100117-001	61,825	2.92
50WW14-210128-FD	E2100117-002	62,972	2.93
50WW13-210128	E2100117-003	66,270	2.92
50WW11-210128	E2100117-004	63,132	2.92

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Analyzed:**	2/2/21 13:46

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20210202\20210202_034	**Lab Code:**	EQ2100053-04
Instrument ID:	E-LCMS-01	**Analysis Lot:**	711866
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	74,766	2.92
	Upper Limit ==>	112,149	4.92
	Lower Limit ==>	37,383	0.92
Associated Analyses			
Continuing Calibration Verification	EQ2100053-04	85,208	2.92
50WW12-210128	E2100117-006	64,024	2.92
Lab Control Sample	EQ2100046-02	92,949	2.92

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Analyzed:**	2/2/21 14:51

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20210202\20210202_040	**Lab Code:**	EQ2100053-05
Instrument ID:	E-LCMS-01	**Analysis Lot:**	711866
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	74,766	2.92
	Upper Limit ==>	112,149	4.92
	Lower Limit ==>	37,383	0.92
Associated Analyses			
Continuing Calibration Verification	EQ2100053-05	79,995	2.92

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group Houston

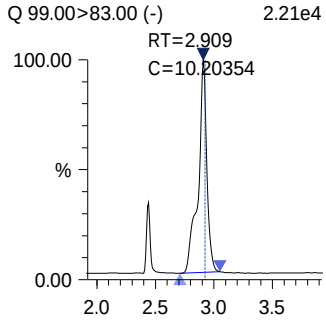
PERCHLORATE7

Sample ID: PERCHLORATE7
Date acquired: 2/1/2021 6:05:11 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210201\20210201_050.lcd
Vial: 31 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	2/1/2021 6:05:11 PM	112968	10.20354	20210201_050	2.909	25.0000	1.0000	31
Sodium Perchlorate-18O4_IS	PERCHLORATE7	2/1/2021 6:05:11 PM	91090	1.00000	20210201_050	2.907	25.0000	1.0000	31

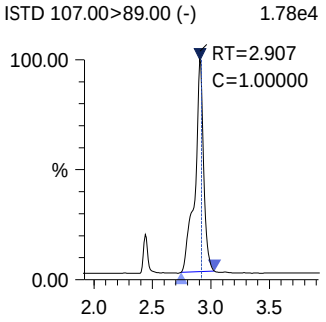
Perchlorate

Conc 10.20354
Area 112968



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 91090



ALS Group Houston

E2100117-001X5

Sample ID: E2100117-001X5
Date acquired: 2/2/2021 1:15:17 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210202\20210202_030.lcd
Vial: 34 | Inj. Volume: 25.0000uL | Tray: 4

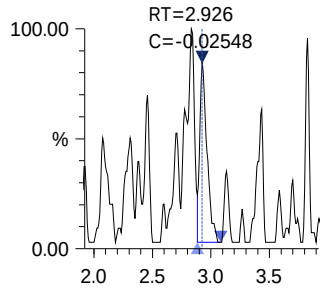
Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	E2100117-001X5	2/2/2021 1:15:17 PM	168	-0.02548	20210202_030	2.926	25.0000	1.0000	34
Sodium Perchlorate-18O4_IS	E2100117-001X5	2/2/2021 1:15:17 PM	61825	1.00000	20210202_030	2.924	25.0000	1.0000	34

Perchlorate

Conc -0.02548

Area 168

Q 99.00>83.00 (-) 4.50e1

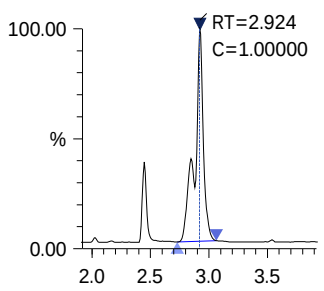


Sodium Perchlorate-18O4_IS

Conc 1.00000

Area 61825

ISTD 107.00>89.00 (-) 1.21e4



ALS Group Houston

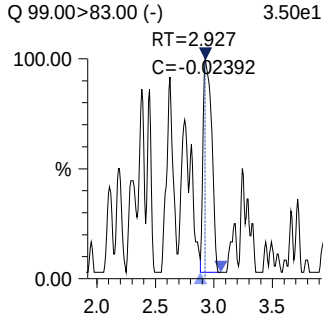
E2100117-002X5

Sample ID: E2100117-002X5
Date acquired: 2/2/2021 1:23:09 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210202\20210202_031.lcd
Vial: 35 | Inj. Volume: 25.0000uL | Tray: 4

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	E2100117-002X5	2/2/2021 1:23:09 PM	182	-0.02392	20210202_031	2.927	25.0000	1.0000	35
Sodium Perchlorate-18O4_IS	E2100117-002X5	2/2/2021 1:23:09 PM	62972	1.00000	20210202_031	2.926	25.0000	1.0000	35

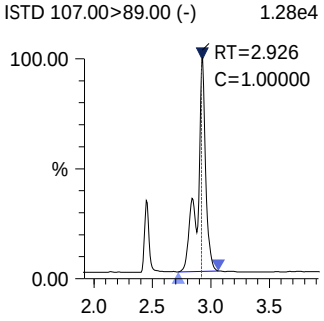
Perchlorate

Conc -0.02392
Area 182



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 62972



ALS Group Houston

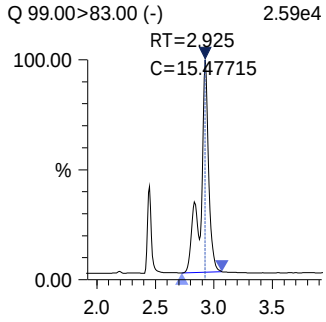
E2100117-003X10

Sample ID: E2100117-003X10
Date acquired: 2/2/2021 1:31:01 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210202\20210202_032.lcd
Vial: 36 | Inj. Volume: 25.0000uL | Tray: 4

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	E2100117-003X10	2/2/2021 1:31:01 PM	124466	15.47715	20210202_032	2.925	25.0000	1.0000	36
Sodium Perchlorate-18O4_IS	E2100117-003X10	2/2/2021 1:31:01 PM	66270	1.00000	20210202_032	2.924	25.0000	1.0000	36

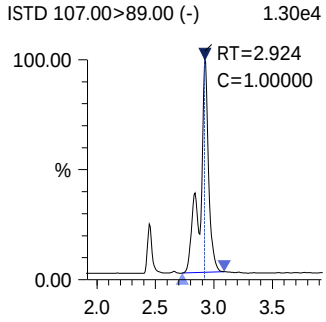
Perchlorate

Conc 15.47715
Area 124466



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 66270



ALS Group Houston

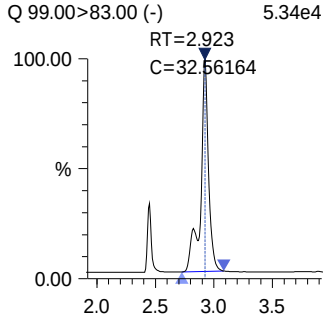
E2100117-004X20

Sample ID: E2100117-004X20
Date acquired: 2/2/2021 1:38:52 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210202\20210202_033.lcd
Vial: 37 | Inj. Volume: 25.0000uL | Tray: 4

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	E2100117-004X20	2/2/2021 1:38:52 PM	249053	32.56164	20210202_033	2.923	25.0000	1.0000	37
Sodium Perchlorate-18O4_IS	E2100117-004X20	2/2/2021 1:38:52 PM	63132	1.00000	20210202_033	2.921	25.0000	1.0000	37

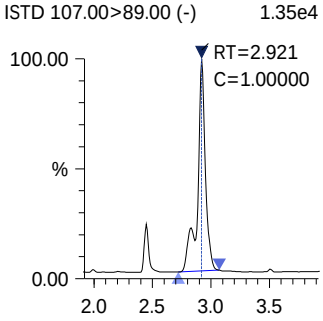
Perchlorate

Conc 32.56164
Area 249053



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 63132



ALS Group Houston

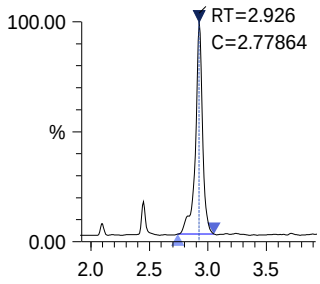
E2100117-005

Sample ID: E2100117-005
Date acquired: 2/2/2021 12:43:50 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210202\20210202_026.lcd
Vial: 38 | Inj. Volume: 25.0000uL | Tray: 4

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	E2100117-005	2/2/2021 12:43:50 PM	26718	2.77864	20210202_026	2.926	25.0000	1.0000	38
Sodium Perchlorate-18O4_IS	E2100117-005	2/2/2021 12:43:50 PM	78134	1.00000	20210202_026	2.924	25.0000	1.0000	38

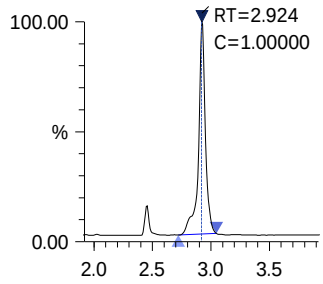
Perchlorate

Conc 2.77864
Area 26718
Q 99.00>83.00 (-) 6.35e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 78134
ISTD 107.00>89.00 (-) 1.90e4



ALS Group Houston

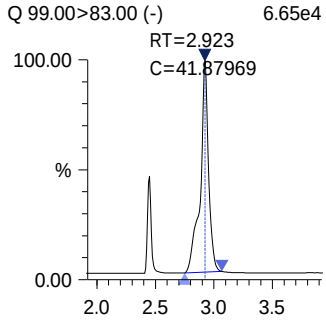
E2100117-006X2000

Sample ID: E2100117-006X2000
Date acquired: 2/2/2021 1:54:43 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210202\20210202_035.lcd
Vial: 39 | Inj. Volume: 25.0000uL | Tray: 4

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	E2100117-006X2000	2/2/2021 1:54:43 PM	324746	41.87969	20210202_035	2.923	25.0000	1.0000	39
Sodium Perchlorate-18O4_IS	E2100117-006X2000	2/2/2021 1:54:43 PM	64024	1.00000	20210202_035	2.922	25.0000	1.0000	39

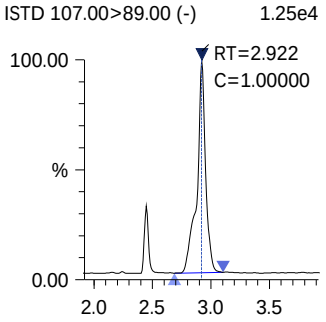
Perchlorate

Conc 41.87969
Area 324746



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 64024



ALS Group Houston

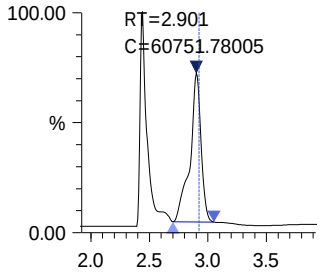
EQ2100046-04

Sample ID: EQ2100046-04
Date acquired: 2/1/2021 6:36:40 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210201\20210201_054.lcd
Vial: 32 | Inj. Volume: 25.0000uL | Tray: 4

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2100046-04	2/1/2021 6:36:40 PM	25142811	60751.78005	20210201_054	2.901	25.0000	1.0000	32
Sodium Perchlorate-18O4_IS	EQ2100046-04	2/1/2021 6:36:40 PM	3421	1.00000	20210201_054	2.896	25.0000	1.0000	32

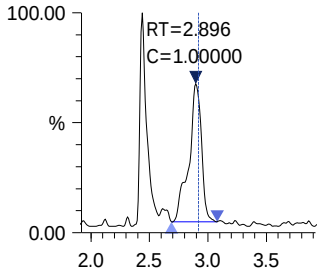
Perchlorate

Conc 60751.78005
Area 25142811
Q 99.00>83.00 (-) 5.46e6



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 3421
ISTD 107.00>89.00 (-) 7.04e2



ALS Group Houston

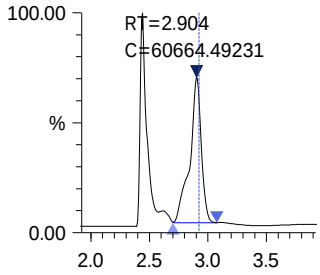
EQ2100046-05

Sample ID: EQ2100046-05
Date acquired: 2/1/2021 6:44:32 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210201\20210201_055.lcd
Vial: 33 | Inj. Volume: 25.0000uL | Tray: 4

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2100046-05	2/1/2021 6:44:32 PM	26438712	60664.49231	20210201_055	2.904	25.0000	1.0000	33
Sodium Perchlorate-18O4_IS	EQ2100046-05	2/1/2021 6:44:32 PM	3602	1.00000	20210201_055	2.900	25.0000	1.0000	33

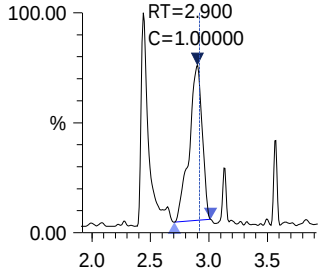
Perchlorate

Conc 60664.49231
Area 26438712
Q 99.00>83.00 (-) 5.65e6



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 3602
ISTD 107.00>89.00 (-) 6.39e2



ALS Group Houston

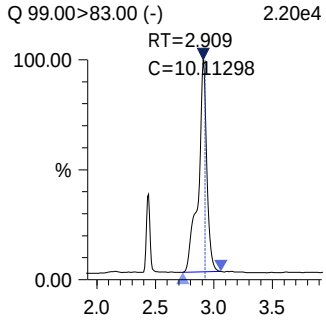
PERCHLORATE7

Sample ID: PERCHLORATE7
Date acquired: 2/1/2021 7:31:57 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210201\20210201_061.lcd
Vial: 31 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	2/1/2021 7:31:57 PM	110018	10.11298	20210201_061	2.909	25.0000	1.0000	31
Sodium Perchlorate-18O4_IS	PERCHLORATE7	2/1/2021 7:31:57 PM	89502	1.00000	20210201_061	2.907	25.0000	1.0000	31

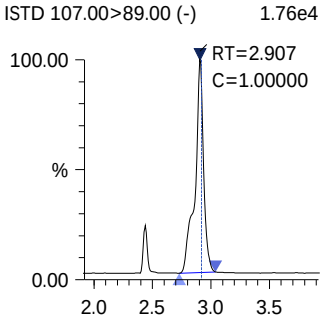
Perchlorate

Conc 10.11298
Area 110018



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 89502



ALS Group Houston

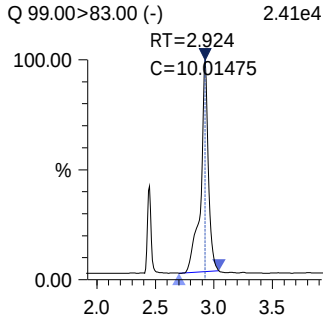
PERCHLORATE7

Sample ID: PERCHLORATE7
Date acquired: 2/2/2021 12:20:04 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210202\20210202_023.lcd
Vial: 31 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	2/2/2021 12:20:04 PM	108257	10.01475	20210202_023	2.924	25.0000	1.0000	31
Sodium Perchlorate-18O4_IS	PERCHLORATE7	2/2/2021 12:20:04 PM	88929	1.00000	20210202_023	2.922	25.0000	1.0000	31

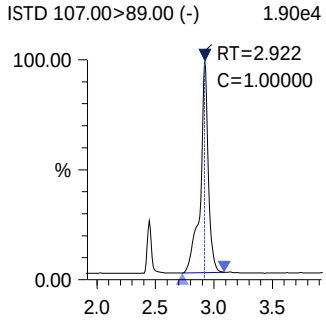
Perchlorate

Conc 10.01475
Area 108257



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 88929



ALS Group Houston

EQ2100046-01

Sample ID: EQ2100046-01
Date acquired: 2/2/2021 12:28:01 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210202\20210202_024.lcd
Vial: 30 | Inj. Volume: 25.0000uL | Tray: 4

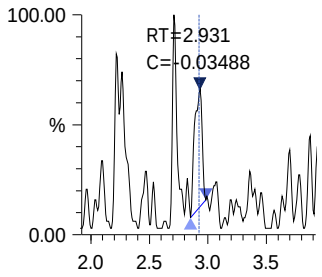
Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2100046-01	2/2/2021 12:28:01 PM	152	-0.03488	20210202_024	2.931	25.0000	1.0000	30
Sodium Perchlorate-18O4_IS	EQ2100046-01	2/2/2021 12:28:01 PM	96543	1.00000	20210202_024	2.899	25.0000	1.0000	30

Perchlorate

Conc -0.03488

Area 152

Q 99.00>83.00 (-) 6.00e1

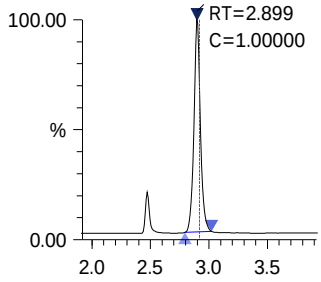


Sodium Perchlorate-18O4_IS

Conc 1.00000

Area 96543

ISTD 107.00>89.00 (-) 2.50e4



ALS Group Houston

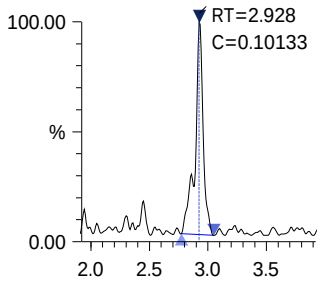
EQ2100046-03

Sample ID: EQ2100046-03
Date acquired: 2/2/2021 12:35:55 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210202\20210202_025.lcd
Vial: 31 | Inj. Volume: 25.0000uL | Tray: 4

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2100046-03	2/2/2021 12:35:55 PM	1832	0.10133	20210202_025	2.928	25.0000	1.0000	31
Sodium Perchlorate-18O4_IS	EQ2100046-03	2/2/2021 12:35:55 PM	101522	1.00000	20210202_025	2.923	25.0000	1.0000	31

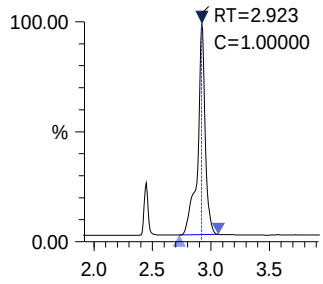
Perchlorate

Conc 0.10133
Area 1832
Q 99.00>83.00 (-) 3.80e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 101522
ISTD 107.00>89.00 (-) 2.29e4



ALS Group Houston

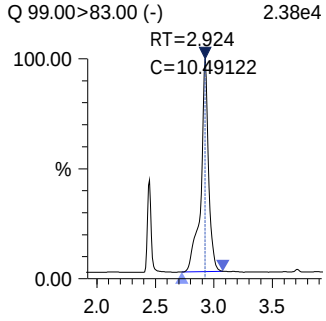
PERCHLORATE7

Sample ID: PERCHLORATE7
Date acquired: 2/2/2021 1:46:48 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210202\20210202_034.lcd
Vial: 31 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	2/2/2021 1:46:48 PM	108640	10.49122	20210202_034	2.924	25.0000	1.0000	31
Sodium Perchlorate-18O4_IS	PERCHLORATE7	2/2/2021 1:46:48 PM	85208	1.00000	20210202_034	2.923	25.0000	1.0000	31

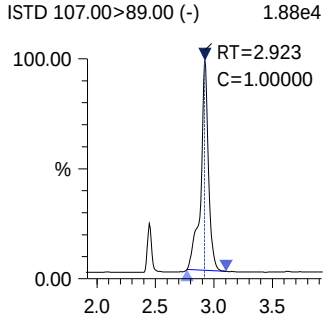
Perchlorate

Conc 10.49122
Area 108640



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 85208



ALS Group Houston

EQ2100046-02

Sample ID: EQ2100046-02
Date acquired: 2/2/2021 2:36:10 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210202\20210202_038.lcd
Vial: 30 | Inj. Volume: 25.0000uL | Tray: 4

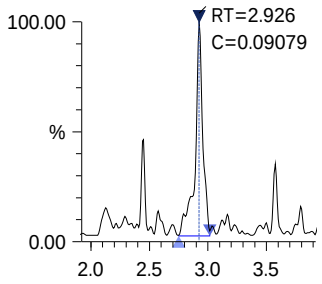
Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2100046-02	2/2/2021 2:36:10 PM	1559	0.09079	20210202_038	2.926	25.0000	1.0000	30
Sodium Perchlorate-18O4_IS	EQ2100046-02	2/2/2021 2:36:10 PM	92949	1.00000	20210202_038	2.924	25.0000	1.0000	30

Perchlorate

Conc 0.09079

Area 1559

Q 99.00>83.00 (-) 3.41e2

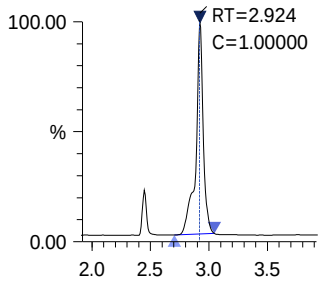


Sodium Perchlorate-18O4_IS

Conc 1.00000

Area 92949

ISTD 107.00>89.00 (-) 2.13e4



ALS Group Houston

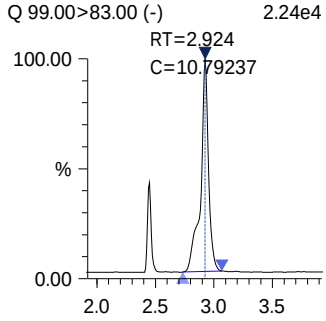
PERCHLORATE7

Sample ID: PERCHLORATE7
Date acquired: 2/2/2021 2:51:59 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20210202\20210202_040.lcd
Vial: 19 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	2/2/2021 2:51:59 PM	104907	10.79237	20210202_040	2.924	25.0000	1.0000	19
Sodium Perchlorate-18O4_IS	PERCHLORATE7	2/2/2021 2:51:59 PM	79995	1.00000	20210202_040	2.923	25.0000	1.0000	19

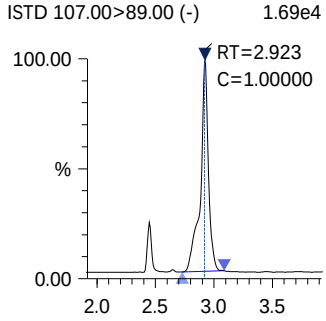
Perchlorate

Conc 10.79237
Area 104907



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 79995



10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 12, 2021

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS21011150**

Laboratory Results for: **LHAAP 50 January 2021**

Dear Susan Huang,

ALS Environmental received 7 sample(s) on Jan 29, 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: 12-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 50 January 2021
Work Order: HS21011150

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21011150-01	50WW14-210128	Groundwater		28-Jan-2021 07:50	29-Jan-2021 10:10	☐
HS21011150-02	50WW14-210128-FD	Groundwater		28-Jan-2021 07:50	29-Jan-2021 10:10	☐
HS21011150-03	50WW13-210128	Groundwater		28-Jan-2021 08:50	29-Jan-2021 10:10	☐
HS21011150-04	50WW11-210128	Groundwater		28-Jan-2021 09:45	29-Jan-2021 10:10	☐
HS21011150-05	50WW06-210128	Groundwater		28-Jan-2021 10:35	29-Jan-2021 10:10	☐
HS21011150-06	50WW12-210128	Groundwater		28-Jan-2021 11:30	29-Jan-2021 10:10	☐
HS21011150-07	Trip Blank-210128	Water	CG-092320-85	28-Jan-2021 00:00	29-Jan-2021 10:10	☐

ALS Houston, US Date: 12-Feb-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP 50 January 2021
Work Order: HS21011150

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston specialty lab. Final report attached.

  The analysis for Methane, Methene, Ethane and CO2 by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.

  The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R377575

Sample ID: 50WW11-210128 (HS21011150-04)

- 1,2_Dichloroethane-d4 (SURR) failure due to matrix.

Sample ID: 50WW12-210128 (HS21011150-06MS)

- MS/MSD QC and RPD failures due sample matrix.

Batch ID: R377691

Sample ID: HS21020249-04MS

- MS and MSD are for an unrelated sample

WetChemistry by Method SW9056

Batch ID: R377508

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Batch ID: R377255

Sample ID: 50WW12-210128 (HS21011150-06MS)

- 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)

ALS Houston, US Date: 12-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 50 January 2021
Sample ID: 50WW14-210128
Collection Date: 28-Jan-2021 07:50

ANALYTICAL REPORT
WorkOrder:HS21011150
Lab ID:HS21011150-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 22:11
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 22:11
cis-1,2-Dichloroethene	**4.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 22:11
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	04-Feb-2021 22:11
Trichloroethene	**46**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 22:11
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 22:11
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*1*	*04-Feb-2021 22:11*
Surr: 4-Bromofluorobenzene	*98.5*			**0**	*85-114*	*%REC*	*1*	*04-Feb-2021 22:11*
Surr: Dibromofluoromethane	*99.6*			**0**	*80-119*	*%REC*	*1*	*04-Feb-2021 22:11*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*04-Feb-2021 22:11*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**385**		**2.00**	**5.00**	**5.00**	**mg/L**	10	03-Feb-2021 22:39
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	29-Jan-2021 18:14
Sulfate	**316**		**2.00**	**5.00**	**5.00**	**mg/L**	10	03-Feb-2021 22:39
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	02-Feb-2021 19:02
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	12-Feb-2021 16:42
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	12-Feb-2021 16:36

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

ALS Houston, US Date: 12-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 50 January 2021
Sample ID: 50WW14-210128-FD
Collection Date: 28-Jan-2021 07:50

ANALYTICAL REPORT
WorkOrder:HS21011150
Lab ID:HS21011150-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 22:32
1,2-Dichloroethane	**0.54**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 22:32
cis-1,2-Dichloroethene	**4.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 22:32
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	04-Feb-2021 22:32
Trichloroethene	**46**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 22:32
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 22:32
Surr: 1,2-Dichloroethane-d4	*117*			**0**	*81-118*	*%REC*	*1*	*04-Feb-2021 22:32*
Surr: 4-Bromofluorobenzene	*107*			**0**	*85-114*	*%REC*	*1*	*04-Feb-2021 22:32*
Surr: Dibromofluoromethane	*96.5*			**0**	*80-119*	*%REC*	*1*	*04-Feb-2021 22:32*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*04-Feb-2021 22:32*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**387**		**2.00**	**5.00**	**5.00**	**mg/L**	10	03-Feb-2021 22:58
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	29-Jan-2021 18:32
Sulfate	**322**		**2.00**	**5.00**	**5.00**	**mg/L**	10	03-Feb-2021 22:58
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	02-Feb-2021 19:02
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	12-Feb-2021 16:42
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	12-Feb-2021 16:36

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

ALS Houston, US Date: 12-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 50 January 2021
Sample ID: 50WW13-210128
Collection Date: 28-Jan-2021 08:50

ANALYTICAL REPORT
WorkOrder:HS21011150
Lab ID:HS21011150-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**1.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 23:56
1,2-Dichloroethane	**2.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 23:56
cis-1,2-Dichloroethene	**26**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 23:56
Tetrachloroethene	**2.4**		**0.30**	**1.0**	**1.0**	**ug/L**	1	04-Feb-2021 23:56
Trichloroethene	**690**		**2.0**	**5.0**	**10**	**ug/L**	10	05-Feb-2021 00:17
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 23:56
Surr: 1,2-Dichloroethane-d4	*114*			**0**	*81-118*	*%REC*	*10*	*05-Feb-2021 00:17*
Surr: 1,2-Dichloroethane-d4	*113*			**0**	*81-118*	*%REC*	*1*	*04-Feb-2021 23:56*
Surr: 4-Bromofluorobenzene	*98.2*			**0**	*85-114*	*%REC*	*1*	*04-Feb-2021 23:56*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*10*	*05-Feb-2021 00:17*
Surr: Dibromofluoromethane	*97.7*			**0**	*80-119*	*%REC*	*1*	*04-Feb-2021 23:56*
Surr: Dibromofluoromethane	*97.3*			**0**	*80-119*	*%REC*	*10*	*05-Feb-2021 00:17*
Surr: Toluene-d8	*91.3*			**0**	*89-112*	*%REC*	*1*	*04-Feb-2021 23:56*
Surr: Toluene-d8	*89.1*			**0**	*89-112*	*%REC*	*10*	*05-Feb-2021 00:17*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**387**		**2.00**	**5.00**	**5.00**	**mg/L**	10	03-Feb-2021 23:16
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	29-Jan-2021 19:44
Sulfate	**302**		**2.00**	**5.00**	**5.00**	**mg/L**	10	03-Feb-2021 23:16
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	02-Feb-2021 19:02
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	12-Feb-2021 16:42
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	12-Feb-2021 16:36

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

ALS Houston, US Date: 12-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 50 January 2021
Sample ID: 50WW11-210128
Collection Date: 28-Jan-2021 09:45

ANALYTICAL REPORT
WorkOrder:HS21011150
Lab ID:HS21011150-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**2.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 23:14
1,2-Dichloroethane	**2.4**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 23:14
cis-1,2-Dichloroethene	**6.7**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 23:14
Tetrachloroethene	**0.87**	J	**0.30**	**1.0**	**1.0**	**ug/L**	1	04-Feb-2021 23:14
Trichloroethene	**250**		**1.0**	**2.5**	**5.0**	**ug/L**	5	04-Feb-2021 23:35
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 23:14
Surr: 1,2-Dichloroethane-d4	*121*	*S*		**0**	*81-118*	*%REC*	*1*	*04-Feb-2021 23:14*
Surr: 1,2-Dichloroethane-d4	*118*			**0**	*81-118*	*%REC*	*5*	*04-Feb-2021 23:35*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*1*	*04-Feb-2021 23:14*
Surr: 4-Bromofluorobenzene	*109*			**0**	*85-114*	*%REC*	*5*	*04-Feb-2021 23:35*
Surr: Dibromofluoromethane	*97.1*			**0**	*80-119*	*%REC*	*1*	*04-Feb-2021 23:14*
Surr: Dibromofluoromethane	*101*			**0**	*80-119*	*%REC*	*5*	*04-Feb-2021 23:35*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*04-Feb-2021 23:14*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*5*	*04-Feb-2021 23:35*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**295**		**2.00**	**5.00**	**5.00**	**mg/L**	10	03-Feb-2021 23:34
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	29-Jan-2021 20:03
Sulfate	**261**		**2.00**	**5.00**	**5.00**	**mg/L**	10	03-Feb-2021 23:34
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	02-Feb-2021 19:02
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	12-Feb-2021 16:42
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	12-Feb-2021 16:36

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

ALS Houston, US Date: 12-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 50 January 2021
Sample ID: 50WW06-210128
Collection Date: 28-Jan-2021 10:35

ANALYTICAL REPORT
WorkOrder:HS21011150
Lab ID:HS21011150-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 22:53
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 22:53
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 22:53
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	04-Feb-2021 22:53
Trichloroethene	**4.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 22:53
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 22:53
Surr: 1,2-Dichloroethane-d4	*118*			**0**	*81-118*	*%REC*	*1*	*04-Feb-2021 22:53*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*04-Feb-2021 22:53*
Surr: Dibromofluoromethane	*99.9*			**0**	*80-119*	*%REC*	*1*	*04-Feb-2021 22:53*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*04-Feb-2021 22:53*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**3.06**		**0.200**	**0.500**	**0.500**	**mg/L**	1	29-Jan-2021 20:21
Nitrogen, Nitrate (As N)	**0.212**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	29-Jan-2021 20:21
Sulfate	**8.29**		**0.200**	**0.500**	**0.500**	**mg/L**	1	03-Feb-2021 23:52
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	02-Feb-2021 19:02
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	12-Feb-2021 16:42
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	12-Feb-2021 16:36

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

ALS Houston, US Date: 12-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 50 January 2021
Sample ID: 50WW12-210128
Collection Date: 28-Jan-2021 11:30

ANALYTICAL REPORT
WorkOrder:HS21011150
Lab ID:HS21011150-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**5.9**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 20:46
1,2-Dichloroethane	**5.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 20:46
cis-1,2-Dichloroethene	**1.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 20:46
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	04-Feb-2021 20:46
Trichloroethene	**690**		**1.0**	**2.5**	**5.0**	**ug/L**	5	04-Feb-2021 21:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 20:46
Surr: 1,2-Dichloroethane-d4	*90.5*			**0**	*81-118*	*%REC*	*1*	*04-Feb-2021 20:46*
Surr: 1,2-Dichloroethane-d4	*116*			**0**	*81-118*	*%REC*	*5*	*04-Feb-2021 21:49*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*04-Feb-2021 20:46*
Surr: 4-Bromofluorobenzene	*108*			**0**	*85-114*	*%REC*	*5*	*04-Feb-2021 21:49*
Surr: Dibromofluoromethane	*93.5*			**0**	*80-119*	*%REC*	*1*	*04-Feb-2021 20:46*
Surr: Dibromofluoromethane	*98.7*			**0**	*80-119*	*%REC*	*5*	*04-Feb-2021 21:49*
Surr: Toluene-d8	*98.3*			**0**	*89-112*	*%REC*	*1*	*04-Feb-2021 20:46*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*5*	*04-Feb-2021 21:49*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**1,020**		**4.00**	**10.0**	**10.0**	**mg/L**	20	04-Feb-2021 00:10
Nitrogen, Nitrate (As N)	**0.110**	J	**0.0600**	**0.200**	**0.200**	**mg/L**	2	29-Jan-2021 20:39
Sulfate	**499**		**4.00**	**10.0**	**10.0**	**mg/L**	20	04-Feb-2021 00:10
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	02-Feb-2021 19:02
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	12-Feb-2021 16:42
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	12-Feb-2021 16:36

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

ALS Houston, US Date: 12-Feb-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 50 January 2021 WorkOrder:HS21011150
Sample ID: Trip Blank-210128 Lab ID:HS21011150-07
Collection Date: 28-Jan-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-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	07-Feb-2021 15:41
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	07-Feb-2021 15:41
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	07-Feb-2021 15:41
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	07-Feb-2021 15:41
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	07-Feb-2021 15:41
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	07-Feb-2021 15:41
Surr: 1,2-Dichloroethane-d4	*107*			**0**	*81-118*	*%REC*	*1*	*07-Feb-2021 15:41*
Surr: 4-Bromofluorobenzene	*90.2*			**0**	*85-114*	*%REC*	*1*	*07-Feb-2021 15:41*
Surr: Dibromofluoromethane	*98.6*			**0**	*80-119*	*%REC*	*1*	*07-Feb-2021 15:41*
Surr: Toluene-d8	*92.2*			**0**	*89-112*	*%REC*	*1*	*07-Feb-2021 15:41*

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

ALS Houston, US Date: 12-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 50 January 2021
WorkOrder: HS21011150

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R377255 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21011150-01	50WW14-210128	28 Jan 2021 07:50			29 Jan 2021 18:14	1
HS21011150-02	50WW14-210128-FD	28 Jan 2021 07:50			29 Jan 2021 18:32	1
HS21011150-03	50WW13-210128	28 Jan 2021 08:50			29 Jan 2021 19:44	1
HS21011150-04	50WW11-210128	28 Jan 2021 09:45			29 Jan 2021 20:03	1
HS21011150-05	50WW06-210128	28 Jan 2021 10:35			29 Jan 2021 20:21	1
HS21011150-06	50WW12-210128	28 Jan 2021 11:30			29 Jan 2021 20:39	2
Batch ID: R377381 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS21011150-01	50WW14-210128	28 Jan 2021 07:50			02 Feb 2021 19:02	1
HS21011150-02	50WW14-210128-FD	28 Jan 2021 07:50			02 Feb 2021 19:02	1
HS21011150-03	50WW13-210128	28 Jan 2021 08:50			02 Feb 2021 19:02	1
HS21011150-04	50WW11-210128	28 Jan 2021 09:45			02 Feb 2021 19:02	1
HS21011150-05	50WW06-210128	28 Jan 2021 10:35			02 Feb 2021 19:02	1
HS21011150-06	50WW12-210128	28 Jan 2021 11:30			02 Feb 2021 19:02	1
Batch ID: R377508 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21011150-01	50WW14-210128	28 Jan 2021 07:50			03 Feb 2021 22:39	10
HS21011150-02	50WW14-210128-FD	28 Jan 2021 07:50			03 Feb 2021 22:58	10
HS21011150-03	50WW13-210128	28 Jan 2021 08:50			03 Feb 2021 23:16	10
HS21011150-04	50WW11-210128	28 Jan 2021 09:45			03 Feb 2021 23:34	10
HS21011150-05	50WW06-210128	28 Jan 2021 10:35			03 Feb 2021 23:52	1
HS21011150-06	50WW12-210128	28 Jan 2021 11:30			04 Feb 2021 00:10	20
Batch ID: R377575 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21011150-01	50WW14-210128	28 Jan 2021 07:50			04 Feb 2021 22:11	1
HS21011150-02	50WW14-210128-FD	28 Jan 2021 07:50			04 Feb 2021 22:32	1
HS21011150-03	50WW13-210128	28 Jan 2021 08:50			05 Feb 2021 00:17	10
HS21011150-03	50WW13-210128	28 Jan 2021 08:50			04 Feb 2021 23:56	1
HS21011150-04	50WW11-210128	28 Jan 2021 09:45			04 Feb 2021 23:35	5
HS21011150-04	50WW11-210128	28 Jan 2021 09:45			04 Feb 2021 23:14	1
HS21011150-05	50WW06-210128	28 Jan 2021 10:35			04 Feb 2021 22:53	1
HS21011150-06	50WW12-210128	28 Jan 2021 11:30			04 Feb 2021 21:49	5
HS21011150-06	50WW12-210128	28 Jan 2021 11:30			04 Feb 2021 20:46	1
Batch ID: R377691 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21011150-07	Trip Blank-210128	28 Jan 2021 00:00			07 Feb 2021 15:41	1

ALS Houston, US Date: 12-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 50 January 2021
WorkOrder: HS21011150

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R378070 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS21011150-01	50WW14-210128	28 Jan 2021 07:50			12 Feb 2021 16:36	1
HS21011150-02	50WW14-210128-FD	28 Jan 2021 07:50			12 Feb 2021 16:36	1
HS21011150-03	50WW13-210128	28 Jan 2021 08:50			12 Feb 2021 16:36	1
HS21011150-04	50WW11-210128	28 Jan 2021 09:45			12 Feb 2021 16:36	1
HS21011150-05	50WW06-210128	28 Jan 2021 10:35			12 Feb 2021 16:36	1
HS21011150-06	50WW12-210128	28 Jan 2021 11:30			12 Feb 2021 16:36	1
Batch ID: R378072 (0)	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Groundwater	
HS21011150-01	50WW14-210128	28 Jan 2021 07:50			12 Feb 2021 16:42	1
HS21011150-02	50WW14-210128-FD	28 Jan 2021 07:50			12 Feb 2021 16:42	1
HS21011150-03	50WW13-210128	28 Jan 2021 08:50			12 Feb 2021 16:42	1
HS21011150-04	50WW11-210128	28 Jan 2021 09:45			12 Feb 2021 16:42	1
HS21011150-05	50WW06-210128	28 Jan 2021 10:35			12 Feb 2021 16:42	1
HS21011150-06	50WW12-210128	28 Jan 2021 11:30			12 Feb 2021 16:42	1

ALS Houston, US Date: 12-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 50 January 2021
WorkOrder: HS21011150

QC BATCH REPORT

Batch ID: R377575 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210204** Units: **ug/L** Analysis Date: **04-Feb-2021 17:37**
Client ID: Run ID: **VOA6_377575** SeqNo: **5945452** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
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
Tetrachloroethene	1.0	1.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*42.31*	*1.0*	*50*	*0*	*84.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.68*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*45.63*	*1.0*	*50*	*0*	*91.3*	*80 - 119*				
Surr: Toluene-d8	*48.94*	*1.0*	*50*	*0*	*97.9*	*89 - 112*				

LCS Sample ID: **VLCSW-210204** Units: **ug/L** Analysis Date: **04-Feb-2021 17:58**
Client ID: Run ID: **VOA6_377575** SeqNo: **5945453** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	14.21	1.0	20	0	71.1	71 - 131				
1,2-Dichloroethane	19.85	1.0	20	0	99.2	73 - 128				
cis-1,2-Dichloroethene	20.72	1.0	20	0	104	78 - 123				
Tetrachloroethene	20.36	1.0	20	0	102	74 - 129				
Trichloroethene	21.57	1.0	20	0	108	79 - 123				
Vinyl chloride	15.72	1.0	20	0	78.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.85*	*1.0*	*50*	*0*	*97.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.67*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*50*	*1.0*	*50*	*0*	*100.0*	*80 - 119*				
Surr: Toluene-d8	*48.1*	*1.0*	*50*	*0*	*96.2*	*89 - 112*				

ALS Houston, US Date: 12-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 50 January 2021
WorkOrder: HS21011150

QC BATCH REPORT

Batch ID: R377575 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21011150-06MS** Units: **ug/L** Analysis Date: **04-Feb-2021 21:07**
Client ID: **50WW12-210128** Run ID: **VOA6_377575** SeqNo: **5945462** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	19.06	1.0	20	5.861	66.0	71 - 131				S
1,2-Dichloroethane	27	1.0	20	5.76	106	73 - 128				
cis-1,2-Dichloroethene	19.32	1.0	20	1.34	89.9	78 - 123				
Tetrachloroethene	20.43	1.0	20	0	102	74 - 129				
Trichloroethene	707.7	1.0	20	763.7	-280	79 - 123				SEO
Vinyl chloride	8.879	1.0	20	0	44.4	58 - 137				S
Surr: 1,2-Dichloroethane-d4	*45.24*	*1.0*	*50*	*0*	*90.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*56.59*	*1.0*	*50*	*0*	*113*	*85 - 114*				
Surr: Dibromofluoromethane	*47.37*	*1.0*	*50*	*0*	*94.7*	*80 - 119*				
Surr: Toluene-d8	*50.76*	*1.0*	*50*	*0*	*102*	*89 - 112*				

MSD Sample ID: **HS21011150-06MSD** Units: **ug/L** Analysis Date: **04-Feb-2021 21:28**
Client ID: **50WW12-210128** Run ID: **VOA6_377575** SeqNo: **5945463** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	23.16	1.0	20	5.861	86.5	71 - 131	19.06	19.4	20	
1,2-Dichloroethane	27.4	1.0	20	5.76	108	73 - 128	27	1.45	20	
cis-1,2-Dichloroethene	18.59	1.0	20	1.34	86.2	78 - 123	19.32	3.86	20	
Tetrachloroethene	20.2	1.0	20	0	101	74 - 129	20.43	1.13	20	
Trichloroethene	812	1.0	20	763.7	242	79 - 123	707.7	13.7	20	SEO
Vinyl chloride	12.58	1.0	20	0	62.9	58 - 137	8.879	34.5	20	R
Surr: 1,2-Dichloroethane-d4	*58.23*	*1.0*	*50*	*0*	*116*	*81 - 118*	*45.24*	*25.1*	*20*	R
Surr: 4-Bromofluorobenzene	*58.88*	*1.0*	*50*	*0*	*118*	*85 - 114*	*56.59*	*3.97*	*20*	S
Surr: Dibromofluoromethane	*49.62*	*1.0*	*50*	*0*	*99.2*	*80 - 119*	*47.37*	*4.64*	*20*	
Surr: Toluene-d8	*49.63*	*1.0*	*50*	*0*	*99.3*	*89 - 112*	*50.76*	*2.26*	*20*	

The following samples were analyzed in this batch: HS21011150-01 HS21011150-02 HS21011150-03 HS21011150-04 HS21011150-05 HS21011150-06

ALS Houston, US Date: 12-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 50 January 2021
WorkOrder: HS21011150

QC BATCH REPORT

Batch ID: R377691 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210207** Units: **ug/L** Analysis Date: **07-Feb-2021 13:13**
Client ID: Run ID: **VOA6_377691** SeqNo: **5947823** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
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
Tetrachloroethene	1.0	1.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*58.27*	*1.0*	*50*	*0*	*117*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.2*	*1.0*	*50*	*0*	*100*	*85 - 114*				
Surr: Dibromofluoromethane	*47.82*	*1.0*	*50*	*0*	*95.6*	*80 - 119*				
Surr: Toluene-d8	*51.31*	*1.0*	*50*	*0*	*103*	*89 - 112*				

LCS Sample ID: **VLCSW-210207** Units: **ug/L** Analysis Date: **07-Feb-2021 12:10**
Client ID: Run ID: **VOA6_377691** SeqNo: **5947822** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	18.36	1.0	20	0	91.8	71 - 131				
1,2-Dichloroethane	23.69	1.0	20	0	118	73 - 128				
cis-1,2-Dichloroethene	18.78	1.0	20	0	93.9	78 - 123				
Tetrachloroethene	17.41	1.0	20	0	87.1	74 - 129				
Trichloroethene	18.71	1.0	20	0	93.5	79 - 123				
Vinyl chloride	18.63	1.0	20	0	93.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*57.29*	*1.0*	*50*	*0*	*115*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.67*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*46.9*	*1.0*	*50*	*0*	*93.8*	*80 - 119*				
Surr: Toluene-d8	*45.02*	*1.0*	*50*	*0*	*90.0*	*89 - 112*				

ALS Houston, US Date: 12-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 50 January 2021
WorkOrder: HS21011150

QC BATCH REPORT

Batch ID: R377691 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21020249-04MS** Units: **ug/L** Analysis Date: **07-Feb-2021 14:58**
Client ID: Run ID: **VOA6_377691** SeqNo: **5947988** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	14.55	1.0	20	0	72.7	71 - 131				
1,2-Dichloroethane	19.19	1.0	20	0	96.0	73 - 128				
cis-1,2-Dichloroethene	14.83	1.0	20	0	74.2	78 - 123				S
Tetrachloroethene	22.89	1.0	20	0	114	74 - 129				
Trichloroethene	26.98	1.0	20	5.071	110	79 - 123				
Vinyl chloride	10.05	1.0	20	0	50.2	58 - 137				S
Surr: 1,2-Dichloroethane-d4	*54.54*	*1.0*	*50*	*0*	*109*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*56.8*	*1.0*	*50*	*0*	*114*	*85 - 114*				
Surr: Dibromofluoromethane	*49.4*	*1.0*	*50*	*0*	*98.8*	*80 - 119*				
Surr: Toluene-d8	*50.03*	*1.0*	*50*	*0*	*100*	*89 - 112*				

MSD Sample ID: **HS21020249-04MSD** Units: **ug/L** Analysis Date: **07-Feb-2021 15:19**
Client ID: Run ID: **VOA6_377691** SeqNo: **5947989** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	10.99	1.0	20	0	54.9	71 - 131	14.55	27.9	20	SR
1,2-Dichloroethane	24.35	1.0	20	0	122	73 - 128	19.19	23.7	20	R
cis-1,2-Dichloroethene	16.47	1.0	20	0	82.4	78 - 123	14.83	10.5	20	
Tetrachloroethene	21.22	1.0	20	0	106	74 - 129	22.89	7.57	20	
Trichloroethene	28.2	1.0	20	5.071	116	79 - 123	26.98	4.45	20	
Vinyl chloride	8.067	1.0	20	0	40.3	58 - 137	10.05	21.9	20	SR
Surr: 1,2-Dichloroethane-d4	*51.91*	*1.0*	*50*	*0*	*104*	*81 - 118*	*54.54*	*4.94*	*20*	
Surr: 4-Bromofluorobenzene	*57.54*	*1.0*	*50*	*0*	*115*	*85 - 114*	*56.8*	*1.31*	*20*	S
Surr: Dibromofluoromethane	*47.11*	*1.0*	*50*	*0*	*94.2*	*80 - 119*	*49.4*	*4.75*	*20*	
Surr: Toluene-d8	*48.14*	*1.0*	*50*	*0*	*96.3*	*89 - 112*	*50.03*	*3.86*	*20*	

The following samples were analyzed in this batch: HS21011150-07

ALS Houston, US Date: 12-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 50 January 2021
WorkOrder: HS21011150

QC BATCH REPORT

Batch ID: R377255 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **30-Jan-2021 03:17**
Client ID: Run ID: **ICS2100_377255** SeqNo: **5938397** 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

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **30-Jan-2021 03:35**
Client ID: Run ID: **ICS2100_377255** SeqNo: **5938398** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	18.9	0.500	20	0	94.5	80 - 120				
Nitrogen, Nitrate (As N)	3.788	0.100	4	0	94.7	80 - 120				

MS Sample ID: **HS21011150-06MS** Units: **mg/L** Analysis Date: **29-Jan-2021 20:57**
Client ID: **50WW12-210128** Run ID: **ICS2100_377255** SeqNo: **5938388** PrepDate: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1002	1.00	20	1009	-39.3	80 - 120				SEO
Nitrogen, Nitrate (As N)	3.804	0.200	4	0.1102	92.4	80 - 120				

MSD Sample ID: **HS21011150-06MSD** Units: **mg/L** Analysis Date: **29-Jan-2021 21:15**
Client ID: **50WW12-210128** Run ID: **ICS2100_377255** SeqNo: **5938389** PrepDate: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1003	1.00	20	1009	-32.6	80 - 120	1002	0.135	20	SEO
Nitrogen, Nitrate (As N)	3.801	0.200	4	0.1102	92.3	80 - 120	3.804	0.0947	20	

The following samples were analyzed in this batch: HS21011150-01 HS21011150-02 HS21011150-03 HS21011150-04 HS21011150-05 HS21011150-06

ALS Houston, US Date: 12-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 50 January 2021
WorkOrder: HS21011150

QC BATCH REPORT

Batch ID: R377508 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **04-Feb-2021 05:21**
Client ID: Run ID: **ICS2100_377508** SeqNo: **5943858** 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
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **04-Feb-2021 05:37**
Client ID: Run ID: **ICS2100_377508** SeqNo: **5943859** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.49	0.500	20	0	97.5	80 - 120				
Sulfate	19.66	0.500	20	0	98.3	80 - 120				

MS Sample ID: **HS21011075-02MS** Units: **mg/L** Analysis Date: **04-Feb-2021 04:47**
Client ID: Run ID: **ICS2100_377508** SeqNo: **5943856** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	210	5.00	100	114.8	95.2	80 - 120				
Sulfate	200.1	5.00	100	103	97.1	80 - 120				

MSD Sample ID: **HS21011075-02MSD** Units: **mg/L** Analysis Date: **04-Feb-2021 05:04**
Client ID: Run ID: **ICS2100_377508** SeqNo: **5943857** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	213.3	5.00	100	114.8	98.5	80 - 120	210	1.54	20	
Sulfate	200.7	5.00	100	103	97.7	80 - 120	200.1	0.311	20	

The following samples were analyzed in this batch: HS21011150-01 HS21011150-02 HS21011150-03 HS21011150-04 HS21011150-05 HS21011150-06

ALS Houston, US Date: 12-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 50 January 2021
WorkOrder: **HS21011150**

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: 12-Feb-21

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	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	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2021	31-Dec-2021
North Dakota	R-193 2020-2021	30-Apr-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US Date: 12-Feb-21

Sample Receipt Checklist

Work Order ID: HS21011150 **Date/Time Received:** **29-Jan-2021 10:10**

Client Name: CBI-Houston **Received by:** **Jared R. Makan**

Completed By:	/S/ Paresh M. Giga	29-Jan-2021 16:33	**Reviewed by:**	/S/ Corey Grandits	29-Jan-2021 20:36
	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):	0.6C U/c	IR31
Cooler(s)/Kit(s):	46810	
Date/Time sample(s) sent to storage:	1/29/2021 15:00	

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:

01078553

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: **LHAAP50 January 2021**

Prepared By: Scott Beasinger

P.O. Number

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 (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW6850	Remarks (Preservatives, etc.)
50WW14-210128	WG	1/28/21/0750		13	X	X	X	X	X	X	
50WW14-210128-FD	WG	1/28/21/0750		13	X	X	X	X	X	X	
50WW13-210128	WG	1/28/21/0850		13	X	X	X	X	X	X	
50WW11-210128	WG	1/28/21/0945		13	X	X	X	X	X	X	
50WW06-210128	WG	1/28/21/1035		13	X	X	X	X	X	X	
50WW12-210128	WG	1/28/21/1130		13	X	X	X	X	X	X	
50WW12-210128-MS	WG	1/28/21/1130		13	X	X	X	X	X	X	
50WW12-210128-MSD	WG	1/28/21/1130		13	X	X	X	X	X	X	

Additional Remarks: Standard TAT on all parameters. Please email results to Susan.Huang@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 Beasinger	1/28/21	1430		1/29/2021	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:

Aptim Environmental & Infrastructure, Inc.
LHAAP 50 January 2021

HS21011150

4681b 0.60.
#31
c1f00

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

01078554

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

HS21011150

Aptim Environmental & Infrastucture, Inc.
LHAAP 50 January 2021

Project: APTIM LONGHORN
ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP50 January 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 (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW6850					Remarks (Preservatives, etc.)
TRIP BLANK-210128	W	1/28/21		2	X										

Additional Remarks: **Standard TAT on all parameters. Please email results to Susan.Huang@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	1/28/21	1430		1/29/2021	10:10						

For Lab Use Only

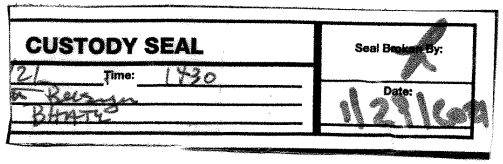
Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

01078555

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
46810
Date:
Name:
Company:


CUSTODY SEAL
Time:
Seal Broken By:
Date:

FedEx
TRK#
0221 9473 0838 9299
FRI - 29 JAN AA
PRIORITY OVERNIGHT
AB SGRA
46810
77099
TX-US
IAH
FID: 162785 28Jan2021 GGGA 560G1/1136/05A2

February 02, 2021 Service Request No:E2100117

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: HS21011150

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 29, 2021
For your reference, these analyses have been assigned our service request number **E2100117.**

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.:**	E2100117
Project:	HS21011150	**Date Received:**	01/29/21
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 01/29/21.

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:

EQ2100046: 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 outside QC limits; parent sample 83,800 ug/L.

Samples E2100117-001/002 lowest practical dilution performed due to matrix 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
Project: HS21011150 **Service Request:**E2100117

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100117-001	50WW14-210128	1/28/2021	0750
E2100117-002	50WW14-210128-FD	1/28/2021	0750
E2100117-003	50WW13-210128	1/28/2021	0850
E2100117-004	50WW11-210128	1/28/2021	0945
E2100117-005	50WW06-210128	1/28/2021	1035
E2100117-006	50WW12-210128	1/28/2021	1130

Service Request Summary

Folder #: **E2100117**
Client Name: ALS Environmental - US
Project Name: HS21011150
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: 01/29/21
Internal Due Date: 2/12/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21011150
EDD: No EDD Specified

8 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved
Location: EHRMS-WIC 4A
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100117-001	50WW14-210128	Ground Water	01/28/21 0750	**IV**
E2100117-002	50WW14-210128-FD	Ground Water	01/28/21 0750	**IV**
E2100117-003	50WW13-210128	Ground Water	01/28/21 0850	**IV**
E2100117-004	50WW11-210128	Ground Water	01/28/21 0945	**IV**
E2100117-005	50WW06-210128	Ground Water	01/28/21 1035	**IV**
E2100117-006	50WW12-210128	Ground Water	01/28/21 1130	**IV**

Service Request Summary

Folder #: **E2100117**
Client Name: ALS Environmental - US
Project Name: HS21011150
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: 01/29/21
Internal Due Date: 2/12/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21011150
EDD: No EDD Specified

8 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved
Location: EHRMS-WIC 4A
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	2	MS/MSD
Semivoa GCMS	ClO4 DOD/6850	5	II Due 2/12, IV due 2/19

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	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
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
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
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	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
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:** **15568**

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: HS21011150
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21011150-01**	**50WW14-210128**	**Groundwater**	**28 Jan 2021 07:50**
	Provide Level II and Level IV reports on a seperate pdf.			12 Feb 2021
2.	**HS21011150-02**	**50WW14-210128-FD**	**Groundwater**	**28 Jan 2021 07:50**
	Provide Level II and Level IV reports on a seperate pdf.			12 Feb 2021
3.	**HS21011150-03**	**50WW13-210128**	**Groundwater**	**28 Jan 2021 08:50**
	Provide Level II and Level IV reports on a seperate pdf.			12 Feb 2021
4.	**HS21011150-04**	**50WW11-210128**	**Groundwater**	**28 Jan 2021 09:45**
	Provide Level II and Level IV reports on a seperate pdf.			12 Feb 2021
5.	**HS21011150-05**	**50WW06-210128**	**Groundwater**	**28 Jan 2021 10:35**
	Provide Level II and Level IV reports on a seperate pdf.			12 Feb 2021
6.	**HS21011150-06**	**50WW12-210128**	**Groundwater**	**28 Jan 2021 11:30**
	Provide Level II and Level IV reports on a seperate pdf.			12 Feb 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS2101150-06 = MS/MSD

QC Level: DOD IV (DoD Data Package)

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **15568**

Relinquished By: _____ Date/Time: 11/29/2021

Received By: _____ Date/Time: 11/29/21 1700

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

Cooler Receipt Form

Project Chemist CG

Client/Project ALS-HI

Thermometer ID IR41

Date/Time Received: 11/29/21 Initials: CG Date/Time Logged in: 11/29/21 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		11/29/21	1304	CG	0.3	X
						☐
						☐
						☐

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#: 373567 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/JRODRIGUEZ **Prep Method:** Method **Prep Date/Time:** 2/1/21 09:04

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100117-001	50WW14-210128	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2100117-002	50WW14-210128-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2100117-003	50WW13-210128	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2100117-004	50WW11-210128	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100117-005	50WW06-210128	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100117-006	50WW12-210128	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100118-001	50WW08-210125	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2100118-002	50WW05-210125	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2100118-003	50WW29-210125	.01	6850/ClO4 DOD			Ground Water	10mL	
10	EQ2100046-01	MB		6850/ClO4 DOD			Liquid	10mL	
11	EQ2100046-02	LCS		6850/ClO4 DOD			Liquid	10mL	
12	EQ2100046-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
13	EQ2100046-04	50WW12-210128 MS	.02	6850/ClO4 DOD			Liquid	10mL	
14	EQ2100046-05	50WW12-210128 DMS	.03	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100046-02	1.00µL	EQ2100046-03	1.00µL	EQ2100046-04	1.00µL	EQ2100046-05	1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100117-001	100.00µL	E2100117-002	100.00µL	E2100117-003	100.00µL	E2100117-004	100.00µL	E2100117-005	100.00µL	E2100117-006	100.00µL
E2100117-006.R	100.00µL	E2100118-001	100.00µL	E2100118-002	100.00µL	E2100118-003	100.00µL	EQ2100046-01	100.00µL	EQ2100046-02	100.00µL
EQ2100046-03	100.00µL	EQ2100046-04	100.00µL	EQ2100046-05	100.00µL						

Preparation Steps

Step: Preparation
Started: 2/1/21 09:04
Finished: 2/1/21 09:29
By: GRIVERA
Comments

Comments: _____

Preparation Information Benchsheet

Prep Run#: 373567
Team: Semivoa GCMS/JRODRIGUEZ

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 2/1/21 09:04

Reviewed By: GR Date: 2/1/21

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:**	E2100117
Project:	HS21011150	**Date Collected:**	1/28/21 0750
Sample Matrix:	Ground Water	**Date Received:**	1/29/21
Sample Name:	50WW14-210128	**Units:**	µg/L
Lab Code:	E2100117-001	**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	0.500	0.250	0.125	5	2/ 1/21	2/2/21 13:15	373567	711866	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Collected:**	1/28/21 0750
Sample Matrix:	Ground Water	**Date Received:**	1/29/21
Sample Name:	50WW14-210128-FD	**Units:**	µg/L
Lab Code:	E2100117-002	**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	2/ 1/21	2/2/21 13:23	373567	711866	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Collected:**	1/28/21 0850
Sample Matrix:	Ground Water	**Date Received:**	1/29/21
Sample Name:	50WW13-210128	**Units:**	µg/L
Lab Code:	E2100117-003	**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	**155**		1.00	0.500	0.250	10	2/ 1/21	2/2/21 13:31	373567	711866	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Collected:**	1/28/21 0945
Sample Matrix:	Ground Water	**Date Received:**	1/29/21
Sample Name:	50WW11-210128	**Units:**	µg/L
Lab Code:	E2100117-004	**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	**651**		2.00	1.00	0.500	20	2/ 1/21	2/2/21 13:38	373567	711866	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Collected:**	1/28/21 1035
Sample Matrix:	Ground Water	**Date Received:**	1/29/21
Sample Name:	50WW06-210128	**Units:**	µg/L
Lab Code:	E2100117-005	**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	**2.78**		0.100	0.0500	0.0250	1	2/ 1/21	2/2/21 12:43	373567	711866	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Collected:**	1/28/21 1130
Sample Matrix:	Ground Water	**Date Received:**	1/29/21
Sample Name:	50WW12-210128	**Units:**	µg/L
Lab Code:	E2100117-006	**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	**83800**		200	100	50.0	2000	2/ 1/21	2/2/21 13:54	373567	711866	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100046-01	**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	2/ 1/21	2/2/21 12:28	373567	711866	

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: HS21011150
Sample Matrix: Ground Water

Service Request: E2100117
Date Analyzed: 2/ 2/21

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: 373567

	Lab Control Sample EQ2100046-02			Duplicate Lab Control Sample EQ2100046-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0908	0.100	91	0.101	0.100	101	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:**	E2100117
Project:	HS21011150	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100046-02	**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	**0.0908**	J	0.100	0.0500	0.0250	1	2/ 1/21	2/2/21 14:36	373567	711866	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100046-03	**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	**0.101**		0.100	0.0500	0.0250	1	2/ 1/21	2/2/21 12:35	373567	711866	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Collected:**	1/28/21
Sample Matrix:	Ground Water	**Date Received:**	1/29/21
		Date Analyzed:	2/ 1/21

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	50WW12-210128	**Units:**	µg/L
Lab Code:	E2100117-006	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		50WW12-210128MS				50WW12-210128DMS					
		Matrix Spike				**Duplicate Matrix Spike**					
		EQ2100046-04				EQ2100046-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	83800	60800	0.100	-23007600 #	60700	0.100	-23094888#	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:**	E2100117
Project:	HS21011150	**Date Collected:**	1/28/21 1130
Sample Matrix:	Ground Water	**Date Received:**	1/29/21
Sample Name:	50WW12-210128	**Units:**	µg/L
Lab Code:	EQ2100046-04	**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	**60800**	E	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 18:36	373567	711817	*

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100117
Project:	HS21011150	**Date Collected:**	1/28/21 1130
Sample Matrix:	Ground Water	**Date Received:**	1/29/21
Sample Name:	50WW12-210128	**Units:**	µg/L
Lab Code:	EQ2100046-05	**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	**60700**	E	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 18:44	373567	711817	*

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

LABORATORY REPORT

February 12, 2021

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road Suite 210
Houston, TX 77099-4338

RE: HS21011150

Dear RJ:

Enclosed are the results of the samples submitted to our laboratory on February 2, 2021. For your reference, these analyses have been assigned our service request number P2100515.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Hayden Akers at 2:19 pm, Feb 12, 2021

Hayden Akers
Project Manager

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

Client: ALS Laboratory Group
Project: HS21011150

Service Request No: P2100515

CASE NARRATIVE

The samples were received intact under chain of custody on February 2, 2021 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Carbon Dioxide Analysis

The samples were analyzed for carbon dioxide using a gas chromatograph equipped with a thermal conductivity detector (TCD). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least four hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (carbon dioxide) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175 as described in laboratory SOP VOA-DISGAS. This analyte is included on the laboratory's NELAP and DoD-ELAP scope of accreditation.

Manual integrations were performed on the following sample(s) and analyte(s). Refer to the raw data for additional information.

Sample Identification(s)	Analyte(s)
P2100515-001-006, 006MS, 006 MSD	Carbon Dioxide

The recovery matrix spike and matrix spike duplicate did not meet the DoD or laboratory recovery limit for carbon dioxide due to possible matrix interference. However all quality control parameters were met with laboratory control sample and its duplicate. The data has been flagged accordingly.

The lower control criterion was exceeded for carbon dioxide in the Laboratory Control Sample (LCS) analyzed on February 10, 2021. The error associated with the reduced recovery equates to a potential low bias. However, a Method Reporting Limit (MRL) check standard containing the analyte of concern was analyzed and verified that instrument sensitivity was adequate to detect the analyte at the MRL on the day of analysis. Since the sensitivity was verified and the samples were non-detect, the data quality is not significantly affected. No further corrective action was taken.

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

Client: ALS Laboratory Group
Project: HS21011150

Service Request No: P2100515

Methane, Ethene and Ethane Analysis

The samples were also analyzed for methane, ethene, and ethane using a gas chromatograph equipped with a flame ionization detector (FID). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least two hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (methane, ethene and ethane) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP or DoD-ELAP accreditation.

Manual integrations were performed on the following sample(s) and analyte(s). Refer to the raw data for additional information.

Sample Identification(s)	Analyte(s)
P2100515-001,004,006, 006MS	Methane

The recovery for the matrix spike and its duplicate were outside of the DOD control limits for ethane. However, spike recoveries were within laboratory generated limits. In addition all quality control parameters were met with the laboratory control sample and its duplicate. The data has been flagged accordingly.

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 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.

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2018027
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1776326
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-007
Pennsylvania DEP	http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413-19-10
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272019-10
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: ALS Laboratory Group
Project ID: HS21011150

Service Request: P2100515

Date Received: 2/2/2021
Time Received: 10:00

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - CO2	RSK 175 - Gases
50WW14-210128	P2100515-001	Water	1/28/2021	07:50	X	X
50WW14-210128-FD	P2100515-002	Water	1/28/2021	07:50	X	X
50WW13-210128	P2100515-003	Water	1/28/2021	08:50	X	X
50WW11-210128	P2100515-004	Water	1/28/2021	09:45	X	X
50WW06-210128	P2100515-005	Water	1/28/2021	10:35	X	X
50WW12-210128	P2100515-006	Water	1/28/2021	11:30	X	X

RJ100515

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: 15569**

SUBCONTRACT TO:

ALS Environmental
2655 Park Center Drive, Suite A
Simi Valley, CA 93065 **Phone:** +1 805 526 7161

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: HS21011150
TSR: Sonia West

	LAB SAMPLE ID / ANALYSIS REQUESTED	CLIENT SAMPLE ID	MATRIX	COLLECT DATE / DUE DATE
1.	**HS21011150-01**	**50WW14-210128**	**Groundwater**	**28 Jan 2021 07:50**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	12 Feb 2021
2.	**HS21011150-02**	**50WW14-210128-FD**	**Groundwater**	**28 Jan 2021 07:50**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	12 Feb 2021
3.	**HS21011150-03**	**50WW13-210128**	**Groundwater**	**28 Jan 2021 08:50**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	12 Feb 2021
4.	**HS21011150-04**	**50WW11-210128**	**Groundwater**	**28 Jan 2021 09:45**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	12 Feb 2021
5.	**HS21011150-05**	**50WW06-210128**	**Groundwater**	**28 Jan 2021 10:35**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	12 Feb 2021
6.	**HS21011150-06**	**50WW12-210128**	**Groundwater**	**28 Jan 2021 11:30**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	12 Feb 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS2101150-06 = MS/MSD
3 x Neat Vials & 3 x HCL Vials

P2 100515

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **15569**

QC Level: DOD IV (DoD Data Package)

Relinquished By:	J. Mercer	**Date/Time:**	02/01/21 18:00
Received By:		**Date/Time:**	2-2-21 1000 2° cor
Cooler ID(s):		**Temperature(s):**	

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P2100515

Project: HS21011150

Sample(s) received on: 2/2/21 Date opened: 2/2/21 by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature: ° C Blank Temperature: 2° C	Wet Ic		
8	Were **custody seals** on outside of cooler/Box/Container?	☒	☐	☐
	Location of seal(s)? Cooler lid. Sealing Lid?	☒	☐	☐
	Were signature and date included?	☒	☐	☐
	Were seals intact?	☒	☐	☐
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☒	☐	☐
	Were **VOA vials** checked for presence/absence of air bubbles?	☒	☐	☐
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☒	☐
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2100515-001.01	40mL VOA NP				A	
P2100515-001.02	40mL VOA NP		6		A	
P2100515-001.03	40mL VOA NP				A	
P2100515-001.04	40ml VOA HCL				A	
P2100515-001.05	40ml VOA HCL		1		A	
P2100515-001.06	40ml VOA HCL				A	
P2100515-002.01	40mL VOA NP				A	
P2100515-002.02	40mL VOA NP		6		A	
P2100515-002.03	40mL VOA NP				A	
P2100515-002.04	40ml VOA HCL				A	
P2100515-002.05	40ml VOA HCL		1		A	
P2100515-002.06	40ml VOA HCL				A	
P2100515-003.01	40mL VOA NP				A	
P2100515-003.02	40mL VOA NP		6		A	
P2100515-003.03	40mL VOA NP				A	

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P2100515

Project: HS21011150

Sample(s) received on: 2/2/21 Date opened: 2/2/21 by: ADAVID

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2100515-003.04	40ml VOA HCL				A	
P2100515-003.05	40ml VOA HCL		1		A	
P2100515-003.06	40ml VOA HCL				A	
P2100515-004.01	40mL VOA NP				A	
P2100515-004.02	40mL VOA NP		6		A	
P2100515-004.03	40mL VOA NP				A	
P2100515-004.04	40ml VOA HCL				A	
P2100515-004.05	40ml VOA HCL		1		A	
P2100515-004.06	40ml VOA HCL				A	
P2100515-005.01	40mL VOA NP				A	
P2100515-005.02	40mL VOA NP		5		A	
P2100515-005.03	40mL VOA NP				A	
P2100515-005.04	40ml VOA HCL				A	
P2100515-005.05	40ml VOA HCL		1		A	
P2100515-005.06	40ml VOA HCL				A	
P2100515-006.01	40mL VOA NP				A	
P2100515-006.02	40mL VOA NP				A	
P2100515-006.03	40mL VOA NP				A	
P2100515-006.04	40ml VOA HCL		1		A	
P2100515-006.05	40ml VOA HCL		1		A	
P2100515-006.06	40ml VOA HCL		1		A	
P2100515-006.07	40mL VOA NP				A	
P2100515-006.08	40mL VOA NP		6		A	
P2100515-006.09	40mL VOA NP		6		A	
P2100515-006.10	40mL VOA NP				A	
P2100515-006.11	40mL VOA NP				A	
P2100515-006.12	40mL VOA NP				A	
P2100515-006.13	40ml VOA HCL		6		A	
P2100515-006.14	40ml VOA HCL				A	
P2100515-006.15	40ml VOA HCL				A	
P2100515-006.16	40ml VOA HCL				A	
P2100515-006.17	40ml VOA HCL				A	
P2100515-006.18	40ml VOA HCL				A	

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Project ID: **HS21011150** ALS Project ID: P2100515

Carbon Dioxide

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Connor Barrett
Matrix: Liquid
Test Notes:

Date(s) Collected: 1/28/21
Date Received: 2/2/21
Date Analyzed: 2/9 - 2/10/21

Client Sample ID	ALS Sample ID	Injection Volume ml(s)	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
50WW14-210128	P2100515-001	0.050	**380,000**	2,000	1,700	740	**L**
50WW14-210128-FD	P2100515-002	0.050	**340,000**	2,000	1,700	740	**L**
50WW13-210128	P2100515-003	0.050	**260,000**	2,000	1,700	740	**L**
50WW11-210128	P2100515-004	0.050	**380,000**	2,000	1,700	740	**L**
50WW06-210128	P2100515-005	0.050	**45,000**	2,000	1,700	740	**L**
50WW12-210128	P2100515-006	0.050	**420,000**	2,000	1,700	740	
Method Control Sample	P210209-MB	0.10	860	1,000	860	370	**U**
Method Control Sample	P210210-MB	0.10	860	1,000	860	370	**U, L**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
L = Laboratory control sample recovery outside the specified limits, results may be biased low.

ALS ENVIRONMENTAL

MATRIX SPIKE / DUPLICATE MATRIX SPIKE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **50WW12-210128**
Client Project ID: **HS21011150**

ALS Project ID: P2100515
ALS Sample ID: P2100515-006MS
P2100515-006DMS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Connor Barrett
Matrix: Liquid
Test Notes:

Date Collected: 1/28/21
Date Received: 2/2/21
Date Analyzed: 2/9/21
Volume(s) Analyzed: 0.050 ml(s)

CAS #	Compound	Spike Amount MS / DMS ug/L	Sample Amount ug/L	Result MS ug/L	Result DMS ug/L	% Recovery MS	% Recovery DMS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
124-38-9	Carbon Dioxide	21,000	425,000	433,000	433,000	**38**	**38**	80-122	0	30	**N**

N = The matrix spike sample recovery is not within control limits. See case narrative.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample** ALS Project ID: P2100515
Client Project ID: **HS21011150** ALS Sample ID: P210209-DLCS

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/TCD Date Received: NA
Analyst: Connor Barrett Date Analyzed: 2/09/21
Matrix: Liquid Volume(s) Analyzed: NA ml(s)
Test Notes:

CAS #	Compound	Spike Amount LCS / DLCS ug/L	Result[1] LCS ug/L	Result[1] DLCS ug/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
124-38-9	Carbon Dioxide	21,000	16,900	16,800	**80**	**80**	80-122	0	12	

[1] = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample** ALS Project ID: P2100515
Client Project ID: **HS21011150** ALS Sample ID: P210210-DLCS

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/TCD Date Received: NA
Analyst: Connor Barrett Date Analyzed: 2/10/21
Matrix: Liquid Volume(s) Analyzed: NA ml(s)
Test Notes:

CAS #	Compound	Spike Amount LCS / DLCS ug/L	Result[1] LCS ug/L	Result[1] DLCS ug/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
124-38-9	Carbon Dioxide	22,900	18,000	18,000	**79**	**79**	80-122	0	12	**L**

[1] = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.
L = Laboratory control sample recovery outside the specified limits, results may be biased low.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW14-210128**
Client Project ID: **HS21011150**

ALS Project ID: P2100515
ALS Sample ID: P2100515-001

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: 1/28/21
Date Received: 2/2/21
Date Analyzed: 2/3/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**1.8**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW14-210128-FD**
Client Project ID: **HS21011150**

ALS Project ID: P2100515
ALS Sample ID: P2100515-002

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: 1/28/21
Date Received: 2/2/21
Date Analyzed: 2/3/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**1.5**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW13-210128**
Client Project ID: **HS21011150**

ALS Project ID: P2100515
ALS Sample ID: P2100515-003

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: 1/28/21
Date Received: 2/2/21
Date Analyzed: 2/3/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**4.3**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW11-210128**
Client Project ID: **HS21011150**

ALS Project ID: P2100515
ALS Sample ID: P2100515-004

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: 1/28/21
Date Received: 2/2/21
Date Analyzed: 2/3/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**4.4**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW06-210128**
Client Project ID: **HS21011150**

ALS Project ID: P2100515
ALS Sample ID: P2100515-005

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: 1/28/21
Date Received: 2/2/21
Date Analyzed: 2/3/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	**U**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW12-210128**
Client Project ID: **HS21011150**

ALS Project ID: P2100515
ALS Sample ID: P2100515-006

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: 1/28/21
Date Received: 2/2/21
Date Analyzed: 2/3/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**0.61**	1.3	1.0	0.51	**J**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **Method Control Sample**
Client Project ID: **HS21011150**

ALS Project ID: P2100515
ALS Sample ID: P210203-MB

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 2/03/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	**U**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

MATRIX SPIKE / DUPLICATE MATRIX SPIKE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **50WW12-210128**
Client Project ID: **HS21011150**

ALS Project ID: P2100515
ALS Sample ID: P2100515-006MS
P2100515-006DMS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: 1/28/21
Date Received: 2/2/21
Date Analyzed: 2/3/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount MS / DMS µg/L	Sample Amount µg/L	Result MS µg/L	Result DMS µg/L	% Recovery MS	% Recovery DMS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	2.52	0.607	2.28	2.63	**66**	**80**	73-125	19	30	**N**
74-85-1	Ethene	4.40	ND	3.29	3.22	**75**	**73**	72-133	3	30	
74-84-0	Ethane	4.72	ND	3.23	3.11	**68**	**66**	74-131	3	30	**N**

N = The matrix spike recovery is not within control limits. See case narrative.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **HS21011150**

ALS Project ID: P2100515
ALS Sample ID: P210203-LCS
P210203-DLCS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 2/03/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount LCS / DLCS µg/L	Result[1] LCS µg/L	Result[1] DLCS µg/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	2.52	2.35	2.31	**93**	**92**	73-125	1	26	
74-85-1	Ethene	4.40	4.72	4.81	**107**	**109**	72-133	2	11	
74-84-0	Ethane	4.72	4.73	4.77	**100**	**101**	74-131	1	10	

[1] = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

February 08, 2021

Analytical Report for Service Request No: K2100950

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: HS21011150

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory February 02, 2021
For your reference, these analyses have been assigned our service request number **K2100950.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

for Kelley Lovejoy
Project Manager

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

Table of Contents

Acronyms
Qualifiers
State Certifications, Accreditations, And Licenses
Case Narrative
Chain of Custody
General Chemistry

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
LOD	Limit of Detection
LOQ	Limit of Quantitation
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.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
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.
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.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

Client: ALS Environmental - US
Project: HS21011150
Sample Matrix: Ground Water

Service Request: K2100950
Date Received: 02/02/2021

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 II requested by the client.

Sample Receipt:

Six ground water samples were received for analysis at ALS Environmental on 02/02/2021. 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.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Noe D. Diaz Date 02/08/2021

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

K2100950

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:** **15567**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626

Phone: +1 360 501 3312

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:	HS21011150
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21011150-01**	**50WW14-210128**	**Groundwater**	**28 Jan 2021 07:50**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			12 Feb 2021
2.	**HS21011150-02**	**50WW14-210128-FD**	**Groundwater**	**28 Jan 2021 07:50**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			12 Feb 2021
3.	**HS21011150-03**	**50WW13-210128**	**Groundwater**	**28 Jan 2021 08:50**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			12 Feb 2021
4.	**HS21011150-04**	**50WW11-210128**	**Groundwater**	**28 Jan 2021 09:45**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			12 Feb 2021
5.	**HS21011150-05**	**50WW06-210128**	**Groundwater**	**28 Jan 2021 10:35**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			12 Feb 2021
6.	**HS21011150-06**	**50WW12-210128**	**Groundwater**	**28 Jan 2021 11:30**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			12 Feb 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS2101150-06 = MS/MSD

QC Level: DOD IV (DoD Data Package)

Rec by NPedersen ALS 2/2/21 1000

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **15567**

Relinquished By: J. [illegible] Date/Time: 02/01/21 18:00

Received By: A Rasmussen Date/Time: 2/2/21 1000

Cooler ID(s): Temperature(s):

PM KL

Cooler Receipt and Preservation Form

Client AB Houston Service Request K21 009150

Received: 2/2/21 Opened: 2/2/21 By: AP Unloaded: 2/2/21 By: AP

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 1 front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N
4. Was a Temperature Blank present in cooler? NA (Y) N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA (Y) N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. (NA) Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified if out of temp	Tracking Number NA	Filed
4.4	—	1802	15567	—	—	9473 0839 9727	

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
8. Were samples received in good condition (unbroken) NA (Y) N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA (Y) N
10. Did all sample labels and tags agree with custody papers? NA (Y) N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA (Y) N
13. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
14. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: _____

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K2100950
Project:	HS21011150	**Date Collected:**	01/28/21
Sample Matrix:	Ground Water	**Date Received:**	02/2/21
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
50WW14-210128	K2100950-001	**1.86**	0.50	0.20	0.07	1	02/04/21 18:00	
50WW14-210128-FD	K2100950-002	**1.88**	0.50	0.20	0.07	1	02/04/21 18:00	
50WW13-210128	K2100950-003	**1.64**	0.50	0.20	0.07	1	02/04/21 18:00	
50WW11-210128	K2100950-004	**1.98**	0.50	0.20	0.07	1	02/04/21 18:00	
50WW06-210128	K2100950-005	**1.55**	0.50	0.20	0.07	1	02/04/21 18:00	
50WW12-210128	K2100950-006	**1.85**	0.50	0.20	0.07	1	02/04/21 18:00	
Method Blank	K2100950-MB	ND U	0.50	0.20	0.07	1	02/04/21 18:00	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2100950
Project	HS21011150	**Date Collected:**	01/28/21
Sample Matrix:	Ground Water	**Date Received:**	02/02/21
		Date Analyzed:	02/04/21

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	50WW12-210128	**Units:**	mg/L
Lab Code:	K2100950-006	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K2100950-006DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	1.85	2.00	1.92	8	10

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

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2100950
Project:	HS21011150	**Date Collected:**	01/28/21
Sample Matrix:	Ground Water	**Date Received:**	02/02/21
		Date Analyzed:	02/4/21
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Carbon, Total Organic

Sample Name:	50WW12-210128	**Units:**	mg/L
Lab Code:	K2100950-006	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

		Matrix Spike K2100950-006MS			**Duplicate Matrix Spike** K2100950-006DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Carbon, Total Organic	1.85	24.3	25.0	90	24.3	25.0	90	83-117	<1	10

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.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2100950
Project:	HS21011150	**Date Analyzed:**	02/04/21
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	712206

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2100950-LCS	25.4	25.0	101	83-117

microbialinsights

10515 Research Drive
Knoxville, TN 37932
Phone: (865) 573-8188
Fax: (865) 573-8133

ANAB ANSI National Accreditation Board ACCREDITED ISO/IEC 17025 TESTING LABORATORY

Client: Vicki Graves
APTIM
2410 Cherahala Blvd
Knoxville, TN 37932
US

Phone: 865-560-7818

Fax:

Identifier: 022SD **Date Rec:** 04/07/2021 **Report Date:** 04/12/2021

Client Project #: 501032 **Client Project Name:** LHAAP 50 April 2021

Purchase Order #: 204818

Test results provided for: CENSUS

Reviewed By:

Charles Slater

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 50 April 2021

MI Project Number: **022SD**
Date Received: 04/07/2021

Sample Information

Client Sample ID:		**50WW14-210406**	**50WW13-210406**	**50WW11-210406**	**50WW06-210406**	**50WW12-210406**
Sample Date:		04/06/2021	04/06/2021	04/06/2021	04/06/2021	04/06/2021
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		HT/CS	HT/CS	HT/CS	HT/CS	HT/CS
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**1.34E+01**	**1.70E+00**	**9.00E-01**	**4.00E-01 (J)**	**4.00E-01 (J)**

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 **4/7/2021**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	04/07/2021	04/12/2021	0 °C	106%	non-detect	non-detect

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

April 27, 2021

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS21040286**

Laboratory Results for: **Longhorn Army Ammunition Plant LHAAP50 April 2021**

Dear Vicki Graves ,

ALS Environmental received 10 sample(s) on Apr 07, 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: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021
Work Order: HS21040286

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21040286-01	50WW08-210405	Water		05-Apr-2021 08:45	07-Apr-2021 10:30	☐
HS21040286-02	50WW05-210405	Water		05-Apr-2021 09:30	07-Apr-2021 10:30	☐
HS21040286-03	50WW29-210405	Water		05-Apr-2021 10:20	07-Apr-2021 10:30	☐
HS21040286-04	50WW14-210406	Water		06-Apr-2021 07:40	07-Apr-2021 10:30	☐
HS21040286-05	50WW13-210406	Water		06-Apr-2021 08:30	07-Apr-2021 10:30	☐
HS21040286-06	50WW11-210406	Water		06-Apr-2021 09:20	07-Apr-2021 10:30	☐
HS21040286-07	50WW11-210406-FD	Water		06-Apr-2021 09:20	07-Apr-2021 10:30	☐
HS21040286-08	50WW06-210406	Water		06-Apr-2021 10:15	07-Apr-2021 10:30	☐
HS21040286-09	50WW12-210406	Water		06-Apr-2021 11:25	07-Apr-2021 10:30	☐
HS21040286-10	TRIP BLANK-210406	Water	CG-121520-1021	06-Apr-2021 00:00	07-Apr-2021 10:30	☐

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021
Work Order: HS21040286

Work Order Comments

• The analysis for Methane, Methene, Ethane and CO2 by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.

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: R381625

Sample ID: CCV

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Batch ID: R381632,R381740

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: R382075

Sample ID: 50WW12-210406 (HS21040286-09)

• Sample ran at 2X due to high concentration of Chloride

Batch ID: R382085

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM5310B

Batch ID: R381942

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021 WorkOrder:HS21040286
Sample ID: 50WW08-210405 Lab ID:HS21040286-01
Collection Date: 05-Apr-2021 08:45 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**1.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2021 01:47
1,2-Dichloroethane	**1.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2021 01:47
cis-1,2-Dichloroethene	**58**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2021 01:47
Tetrachloroethene	**1.6**		**0.30**	**1.0**	**1.0**	**ug/L**	1	15-Apr-2021 01:47
Trichloroethene	**610**		**2.0**	**5.0**	**10**	**ug/L**	10	16-Apr-2021 00:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 01:47
Surr: 1,2-Dichloroethane-d4	*95.9*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2021 01:47*
Surr: 1,2-Dichloroethane-d4	*97.1*			**0**	*81-118*	*%REC*	*10*	*16-Apr-2021 00:49*
Surr: 4-Bromofluorobenzene	*98.9*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2021 01:47*
Surr: 4-Bromofluorobenzene	*94.7*			**0**	*85-114*	*%REC*	*10*	*16-Apr-2021 00:49*
Surr: Dibromofluoromethane	*93.3*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2021 01:47*
Surr: Dibromofluoromethane	*92.7*			**0**	*80-119*	*%REC*	*10*	*16-Apr-2021 00:49*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2021 01:47*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*10*	*16-Apr-2021 00:49*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	14-Apr-2021 17:36

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

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021 WorkOrder:HS21040286
Sample ID: 50WW05-210405 Lab ID:HS21040286-02
Collection Date: 05-Apr-2021 09:30 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**4.7**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2021 01:26
1,2-Dichloroethane	**1.6**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2021 01:26
cis-1,2-Dichloroethene	**140**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2021 01:26
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Apr-2021 01:26
Trichloroethene	**240**		**1.0**	**2.5**	**5.0**	**ug/L**	5	16-Apr-2021 01:10
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 01:26
Surr: 1,2-Dichloroethane-d4	*96.4*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2021 01:26*
Surr: 1,2-Dichloroethane-d4	*98.2*			**0**	*81-118*	*%REC*	*5*	*16-Apr-2021 01:10*
Surr: 4-Bromofluorobenzene	*97.3*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2021 01:26*
Surr: 4-Bromofluorobenzene	*96.0*			**0**	*85-114*	*%REC*	*5*	*16-Apr-2021 01:10*
Surr: Dibromofluoromethane	*94.3*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2021 01:26*
Surr: Dibromofluoromethane	*91.2*			**0**	*80-119*	*%REC*	*5*	*16-Apr-2021 01:10*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2021 01:26*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*5*	*16-Apr-2021 01:10*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	14-Apr-2021 17:36

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

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021 WorkOrder:HS21040286
Sample ID: 50WW29-210405 Lab ID:HS21040286-03
Collection Date: 05-Apr-2021 10:20 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 00:22
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 00:22
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 00:22
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Apr-2021 00:22
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 00:22
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 00:22
Surr: 1,2-Dichloroethane-d4	*95.4*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2021 00:22*
Surr: 4-Bromofluorobenzene	*96.1*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2021 00:22*
Surr: Dibromofluoromethane	*92.7*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2021 00:22*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2021 00:22*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	14-Apr-2021 17:36

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

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021 WorkOrder:HS21040286
Sample ID: 50WW14-210406 Lab ID:HS21040286-04
Collection Date: 06-Apr-2021 07:40 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 00:43
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 00:43
cis-1,2-Dichloroethene	**5.9**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2021 00:43
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Apr-2021 00:43
Trichloroethene	**23**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2021 00:43
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 00:43
Surr: 1,2-Dichloroethane-d4	*96.2*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2021 00:43*
Surr: 4-Bromofluorobenzene	*94.8*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2021 00:43*
Surr: Dibromofluoromethane	*93.7*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2021 00:43*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2021 00:43*
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**1.57**		**0.500**	**0.500**	**1.00**	**mg/L**	1	20-Apr-2021 01:36
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**402**		**2.00**	**5.00**	**5.00**	**mg/L**	10	21-Apr-2021 07:29
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	07-Apr-2021 23:47
Sulfate	**383**		**2.00**	**5.00**	**5.00**	**mg/L**	10	21-Apr-2021 07:29
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	14-Apr-2021 17:36
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Apr-2021 09:11

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

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021 WorkOrder:HS21040286
Sample ID: 50WW13-210406 Lab ID:HS21040286-05
Collection Date: 06-Apr-2021 08:30 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**0.95**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Apr-2021 20:52
1,2-Dichloroethane	**1.9**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Apr-2021 20:52
cis-1,2-Dichloroethene	**16**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Apr-2021 20:52
Tetrachloroethene	**1.7**		**0.30**	**1.0**	**1.0**	**ug/L**	1	14-Apr-2021 20:52
Trichloroethene	**410**		**2.0**	**5.0**	**10**	**ug/L**	10	16-Apr-2021 01:31
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	14-Apr-2021 20:52
Surr: 1,2-Dichloroethane-d4	*94.6*			**0**	*81-118*	*%REC*	*1*	*14-Apr-2021 20:52*
Surr: 1,2-Dichloroethane-d4	*98.8*			**0**	*81-118*	*%REC*	*10*	*16-Apr-2021 01:31*
Surr: 4-Bromofluorobenzene	*97.4*			**0**	*85-114*	*%REC*	*1*	*14-Apr-2021 20:52*
Surr: 4-Bromofluorobenzene	*95.6*			**0**	*85-114*	*%REC*	*10*	*16-Apr-2021 01:31*
Surr: Dibromofluoromethane	*94.5*			**0**	*80-119*	*%REC*	*1*	*14-Apr-2021 20:52*
Surr: Dibromofluoromethane	*94.2*			**0**	*80-119*	*%REC*	*10*	*16-Apr-2021 01:31*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*14-Apr-2021 20:52*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*10*	*16-Apr-2021 01:31*
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**1.76**		**0.500**	**0.500**	**1.00**	**mg/L**	1	20-Apr-2021 01:52
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**386**		**2.00**	**5.00**	**5.00**	**mg/L**	10	21-Apr-2021 07:48
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	08-Apr-2021 00:43
Sulfate	**345**		**2.00**	**5.00**	**5.00**	**mg/L**	10	21-Apr-2021 07:48
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	14-Apr-2021 17:36
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Apr-2021 09:11

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

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021 WorkOrder:HS21040286
Sample ID: 50WW11-210406 Lab ID:HS21040286-06
Collection Date: 06-Apr-2021 09:20 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**1.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Apr-2021 20:10
1,2-Dichloroethane	**1.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Apr-2021 20:10
cis-1,2-Dichloroethene	**5.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Apr-2021 20:10
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	14-Apr-2021 20:10
Trichloroethene	**200**		**1.0**	**2.5**	**5.0**	**ug/L**	5	16-Apr-2021 01:52
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	14-Apr-2021 20:10
Surr: 1,2-Dichloroethane-d4	*93.7*			**0**	*81-118*	*%REC*	*1*	*14-Apr-2021 20:10*
Surr: 1,2-Dichloroethane-d4	*98.3*			**0**	*81-118*	*%REC*	*5*	*16-Apr-2021 01:52*
Surr: 4-Bromofluorobenzene	*96.1*			**0**	*85-114*	*%REC*	*1*	*14-Apr-2021 20:10*
Surr: 4-Bromofluorobenzene	*97.6*			**0**	*85-114*	*%REC*	*5*	*16-Apr-2021 01:52*
Surr: Dibromofluoromethane	*91.7*			**0**	*80-119*	*%REC*	*1*	*14-Apr-2021 20:10*
Surr: Dibromofluoromethane	*91.7*			**0**	*80-119*	*%REC*	*5*	*16-Apr-2021 01:52*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*14-Apr-2021 20:10*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*5*	*16-Apr-2021 01:52*
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**1.65**		**0.500**	**0.500**	**1.00**	**mg/L**	1	20-Apr-2021 02:07
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**295**		**2.00**	**5.00**	**5.00**	**mg/L**	10	21-Apr-2021 08:06
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	08-Apr-2021 01:01
Sulfate	**304**		**2.00**	**5.00**	**5.00**	**mg/L**	10	21-Apr-2021 08:06
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	14-Apr-2021 17:36
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Apr-2021 09:11

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

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021 WorkOrder:HS21040286
Sample ID: 50WW11-210406-FD Lab ID:HS21040286-07
Collection Date: 06-Apr-2021 09:20 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**2.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Apr-2021 20:31
1,2-Dichloroethane	**1.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Apr-2021 20:31
cis-1,2-Dichloroethene	**5.7**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Apr-2021 20:31
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	14-Apr-2021 20:31
Trichloroethene	**230**		**1.0**	**2.5**	**5.0**	**ug/L**	5	16-Apr-2021 02:14
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	14-Apr-2021 20:31
Surr: 1,2-Dichloroethane-d4	*93.6*			**0**	*81-118*	*%REC*	*1*	*14-Apr-2021 20:31*
Surr: 1,2-Dichloroethane-d4	*98.5*			**0**	*81-118*	*%REC*	*5*	*16-Apr-2021 02:14*
Surr: 4-Bromofluorobenzene	*94.3*			**0**	*85-114*	*%REC*	*1*	*14-Apr-2021 20:31*
Surr: 4-Bromofluorobenzene	*93.9*			**0**	*85-114*	*%REC*	*5*	*16-Apr-2021 02:14*
Surr: Dibromofluoromethane	*91.4*			**0**	*80-119*	*%REC*	*1*	*14-Apr-2021 20:31*
Surr: Dibromofluoromethane	*92.4*			**0**	*80-119*	*%REC*	*5*	*16-Apr-2021 02:14*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*14-Apr-2021 20:31*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*5*	*16-Apr-2021 02:14*
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**1.62**		**0.500**	**0.500**	**1.00**	**mg/L**	1	20-Apr-2021 02:23
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**283**		**2.00**	**5.00**	**5.00**	**mg/L**	10	21-Apr-2021 08:24
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	08-Apr-2021 01:19
Sulfate	**294**		**2.00**	**5.00**	**5.00**	**mg/L**	10	21-Apr-2021 08:24
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	14-Apr-2021 17:36
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Apr-2021 09:11

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

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021 WorkOrder:HS21040286
Sample ID: 50WW06-210406 Lab ID:HS21040286-08
Collection Date: 06-Apr-2021 10:15 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 01:04
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 01:04
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 01:04
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Apr-2021 01:04
Trichloroethene	**3.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2021 01:04
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 01:04
Surr: 1,2-Dichloroethane-d4	*95.3*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2021 01:04*
Surr: 4-Bromofluorobenzene	*95.6*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2021 01:04*
Surr: Dibromofluoromethane	*95.5*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2021 01:04*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2021 01:04*
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**1.57**		**0.500**	**0.500**	**1.00**	**mg/L**	1	20-Apr-2021 02:39
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**3.42**		**0.200**	**0.500**	**0.500**	**mg/L**	1	08-Apr-2021 01:38
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	08-Apr-2021 01:38
Sulfate	**10.9**		**0.200**	**0.500**	**0.500**	**mg/L**	1	08-Apr-2021 01:38
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	14-Apr-2021 17:36
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Apr-2021 09:11

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

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021 WorkOrder:HS21040286
Sample ID: 50WW12-210406 Lab ID:HS21040286-09
Collection Date: 06-Apr-2021 11:25 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**17**		**1.0**	**2.5**	**5.0**	**ug/L**	5	15-Apr-2021 02:08
1,2-Dichloroethane	**11**		**1.0**	**2.5**	**5.0**	**ug/L**	5	15-Apr-2021 02:08
cis-1,2-Dichloroethene	**4.0**	J	**1.0**	**2.5**	**5.0**	**ug/L**	5	15-Apr-2021 02:08
Tetrachloroethene	5.0	U	1.5	5.0	5.0	ug/L	5	15-Apr-2021 02:08
Trichloroethene	**1,600**		**10**	**25**	**50**	**ug/L**	50	15-Apr-2021 02:29
Vinyl chloride	2.5	U	1.0	2.5	5.0	ug/L	5	15-Apr-2021 02:08
Surr: 1,2-Dichloroethane-d4	*97.2*			**0**	*81-118*	*%REC*	*5*	*15-Apr-2021 02:08*
Surr: 1,2-Dichloroethane-d4	*95.9*			**0**	*81-118*	*%REC*	*50*	*15-Apr-2021 02:29*
Surr: 4-Bromofluorobenzene	*95.1*			**0**	*85-114*	*%REC*	*5*	*15-Apr-2021 02:08*
Surr: 4-Bromofluorobenzene	*97.7*			**0**	*85-114*	*%REC*	*50*	*15-Apr-2021 02:29*
Surr: Dibromofluoromethane	*92.8*			**0**	*80-119*	*%REC*	*5*	*15-Apr-2021 02:08*
Surr: Dibromofluoromethane	*94.4*			**0**	*80-119*	*%REC*	*50*	*15-Apr-2021 02:29*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*5*	*15-Apr-2021 02:08*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*50*	*15-Apr-2021 02:29*
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MZD
Organic Carbon, Total	**1.73**		**0.500**	**0.500**	**1.00**	**mg/L**	1	20-Apr-2021 03:07
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**994**		**4.00**	**10.0**	**10.0**	**mg/L**	20	21-Apr-2021 08:43
Nitrogen, Nitrate (As N)	**0.226**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	08-Apr-2021 02:33
Sulfate	**572**		**4.00**	**10.0**	**10.0**	**mg/L**	20	21-Apr-2021 08:43
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	14-Apr-2021 17:36
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Apr-2021 09:11

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

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021 WorkOrder:HS21040286
Sample ID: TRIP BLANK-210406 Lab ID:HS21040286-10
Collection Date: 06-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-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 00:01
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 00:01
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 00:01
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Apr-2021 00:01
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 00:01
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2021 00:01
Surr: 1,2-Dichloroethane-d4	*95.1*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2021 00:01*
Surr: 4-Bromofluorobenzene	*95.9*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2021 00:01*
Surr: Dibromofluoromethane	*95.5*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2021 00:01*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2021 00:01*

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

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021
WorkOrder: HS21040286

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R381594 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS21040286-01	50WW08-210405	05 Apr 2021 08:45			14 Apr 2021 17:36	1
HS21040286-02	50WW05-210405	05 Apr 2021 09:30			14 Apr 2021 17:36	1
HS21040286-03	50WW29-210405	05 Apr 2021 10:20			14 Apr 2021 17:36	1
HS21040286-04	50WW14-210406	06 Apr 2021 07:40			14 Apr 2021 17:36	1
HS21040286-05	50WW13-210406	06 Apr 2021 08:30			14 Apr 2021 17:36	1
HS21040286-06	50WW11-210406	06 Apr 2021 09:20			14 Apr 2021 17:36	1
HS21040286-07	50WW11-210406-FD	06 Apr 2021 09:20			14 Apr 2021 17:36	1
HS21040286-08	50WW06-210406	06 Apr 2021 10:15			14 Apr 2021 17:36	1
HS21040286-09	50WW12-210406	06 Apr 2021 11:25			14 Apr 2021 17:36	1
Batch ID: R381625 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21040286-05	50WW13-210406	06 Apr 2021 08:30			14 Apr 2021 20:52	1
HS21040286-06	50WW11-210406	06 Apr 2021 09:20			14 Apr 2021 20:10	1
HS21040286-07	50WW11-210406-FD	06 Apr 2021 09:20			14 Apr 2021 20:31	1
Batch ID: R381632 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21040286-01	50WW08-210405	05 Apr 2021 08:45			15 Apr 2021 01:47	1
HS21040286-02	50WW05-210405	05 Apr 2021 09:30			15 Apr 2021 01:26	1
HS21040286-03	50WW29-210405	05 Apr 2021 10:20			15 Apr 2021 00:22	1
HS21040286-04	50WW14-210406	06 Apr 2021 07:40			15 Apr 2021 00:43	1
HS21040286-08	50WW06-210406	06 Apr 2021 10:15			15 Apr 2021 01:04	1
HS21040286-09	50WW12-210406	06 Apr 2021 11:25			15 Apr 2021 02:29	50
HS21040286-09	50WW12-210406	06 Apr 2021 11:25			15 Apr 2021 02:08	5
HS21040286-10	TRIP BLANK-210406	06 Apr 2021 00:00			15 Apr 2021 00:01	1
Batch ID: R381740 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21040286-01	50WW08-210405	05 Apr 2021 08:45			16 Apr 2021 00:49	10
HS21040286-02	50WW05-210405	05 Apr 2021 09:30			16 Apr 2021 01:10	5
HS21040286-05	50WW13-210406	06 Apr 2021 08:30			16 Apr 2021 01:31	10
HS21040286-06	50WW11-210406	06 Apr 2021 09:20			16 Apr 2021 01:52	5
HS21040286-07	50WW11-210406-FD	06 Apr 2021 09:20			16 Apr 2021 02:14	5
Batch ID: R381942 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Water	
HS21040286-04	50WW14-210406	06 Apr 2021 07:40			20 Apr 2021 01:36	1
HS21040286-05	50WW13-210406	06 Apr 2021 08:30			20 Apr 2021 01:52	1
HS21040286-06	50WW11-210406	06 Apr 2021 09:20			20 Apr 2021 02:07	1
HS21040286-07	50WW11-210406-FD	06 Apr 2021 09:20			20 Apr 2021 02:23	1
HS21040286-08	50WW06-210406	06 Apr 2021 10:15			20 Apr 2021 02:39	1
HS21040286-09	50WW12-210406	06 Apr 2021 11:25			20 Apr 2021 03:07	1

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021
WorkOrder: HS21040286

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R382075 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Water	
HS21040286-04	50WW14-210406	06 Apr 2021 07:40			07 Apr 2021 23:47	1
HS21040286-05	50WW13-210406	06 Apr 2021 08:30			08 Apr 2021 00:43	1
HS21040286-06	50WW11-210406	06 Apr 2021 09:20			08 Apr 2021 01:01	1
HS21040286-07	50WW11-210406-FD	06 Apr 2021 09:20			08 Apr 2021 01:19	1
HS21040286-08	50WW06-210406	06 Apr 2021 10:15			08 Apr 2021 01:38	1
HS21040286-09	50WW12-210406	06 Apr 2021 11:25			08 Apr 2021 02:33	2
Batch ID: R382085 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Water	
HS21040286-04	50WW14-210406	06 Apr 2021 07:40			21 Apr 2021 07:29	10
HS21040286-05	50WW13-210406	06 Apr 2021 08:30			21 Apr 2021 07:48	10
HS21040286-06	50WW11-210406	06 Apr 2021 09:20			21 Apr 2021 08:06	10
HS21040286-07	50WW11-210406-FD	06 Apr 2021 09:20			21 Apr 2021 08:24	10
HS21040286-09	50WW12-210406	06 Apr 2021 11:25			21 Apr 2021 08:43	20
Batch ID: R382406 (0)	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Water	
HS21040286-04	50WW14-210406	06 Apr 2021 07:40			27 Apr 2021 09:11	1
HS21040286-05	50WW13-210406	06 Apr 2021 08:30			27 Apr 2021 09:11	1
HS21040286-06	50WW11-210406	06 Apr 2021 09:20			27 Apr 2021 09:11	1
HS21040286-07	50WW11-210406-FD	06 Apr 2021 09:20			27 Apr 2021 09:11	1
HS21040286-08	50WW06-210406	06 Apr 2021 10:15			27 Apr 2021 09:11	1
HS21040286-09	50WW12-210406	06 Apr 2021 11:25			27 Apr 2021 09:11	1

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021
WorkOrder: HS21040286

QC BATCH REPORT

Batch ID: R381625 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210414** Units: **ug/L** Analysis Date: **14-Apr-2021 13:09**
Client ID: Run ID: **VOA6_381625** SeqNo: **6042150** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
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
Tetrachloroethene	1.0	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*47.82*	*1.0*	*50*	*0*	*95.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.23*	*1.0*	*50*	*0*	*98.5*	*85 - 114*				
Surr: Dibromofluoromethane	*46.94*	*1.0*	*50*	*0*	*93.9*	*80 - 119*				
Surr: Toluene-d8	*53.29*	*1.0*	*50*	*0*	*107*	*89 - 112*				

LCS Sample ID: **VLCSW-210414** Units: **ug/L** Analysis Date: **14-Apr-2021 12:27**
Client ID: Run ID: **VOA6_381625** SeqNo: **6042149** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	20.84	1.0	20	0	104	71 - 131				
1,2-Dichloroethane	19.85	1.0	20	0	99.2	73 - 128				
cis-1,2-Dichloroethene	19.88	1.0	20	0	99.4	78 - 123				
Tetrachloroethene	18.26	1.0	20	0	91.3	74 - 129				
Vinyl chloride	23.3	1.0	20	0	117	58 - 137				
Surr: 1,2-Dichloroethane-d4	*51.5*	*1.0*	*50*	*0*	*103*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.69*	*1.0*	*50*	*0*	*99.4*	*85 - 114*				
Surr: Dibromofluoromethane	*48.17*	*1.0*	*50*	*0*	*96.3*	*80 - 119*				
Surr: Toluene-d8	*48.48*	*1.0*	*50*	*0*	*97.0*	*89 - 112*				

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021
WorkOrder: HS21040286

QC BATCH REPORT

Batch ID: R381625 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS21040618-08MS** Units: **ug/L** Analysis Date: **14-Apr-2021 15:37**
Client ID: Run ID: **VOA6_381625** SeqNo: **6042157** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	19.84	1.0	20	0	99.2	71 - 131				
1,2-Dichloroethane	18.22	1.0	20	0	91.1	73 - 128				
cis-1,2-Dichloroethene	17.79	1.0	20	0	88.9	78 - 123				
Tetrachloroethene	19.64	1.0	20	0	98.2	74 - 129				
Vinyl chloride	21.16	1.0	20	0	106	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.55*	*1.0*	*50*	*0*	*97.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.86*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*47.84*	*1.0*	*50*	*0*	*95.7*	*80 - 119*				
Surr: Toluene-d8	*50.6*	*1.0*	*50*	*0*	*101*	*89 - 112*				

MSD Sample ID: **HS21040618-08MSD** Units: **ug/L** Analysis Date: **14-Apr-2021 15:58**
Client ID: Run ID: **VOA6_381625** SeqNo: **6042158** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	19.33	1.0	20	0	96.7	71 - 131	19.84	2.62	20	
1,2-Dichloroethane	18.23	1.0	20	0	91.1	73 - 128	18.22	0.0103	20	
cis-1,2-Dichloroethene	17.75	1.0	20	0	88.7	78 - 123	17.79	0.24	20	
Tetrachloroethene	19.4	1.0	20	0	97.0	74 - 129	19.64	1.21	20	
Vinyl chloride	20.42	1.0	20	0	102	58 - 137	21.16	3.56	20	
Surr: 1,2-Dichloroethane-d4	*50.06*	*1.0*	*50*	*0*	*100*	*81 - 118*	*48.55*	*3.05*	*20*	
Surr: 4-Bromofluorobenzene	*50.91*	*1.0*	*50*	*0*	*102*	*85 - 114*	*51.86*	*1.84*	*20*	
Surr: Dibromofluoromethane	*47.84*	*1.0*	*50*	*0*	*95.7*	*80 - 119*	*47.84*	*0.00205*	*20*	
Surr: Toluene-d8	*50.85*	*1.0*	*50*	*0*	*102*	*89 - 112*	*50.6*	*0.485*	*20*	

The following samples were analyzed in this batch: HS21040286-05 HS21040286-06 HS21040286-07

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021
WorkOrder: HS21040286

QC BATCH REPORT

Batch ID: R381632 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-210414** Units: **ug/L** Analysis Date: **14-Apr-2021 23:40**
Client ID: Run ID: **VOA6_381632** SeqNo: **6042311** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
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
Tetrachloroethene	1.0	1.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*47.37*	*1.0*	*50*	*0*	*94.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.9*	*1.0*	*50*	*0*	*95.8*	*85 - 114*				
Surr: Dibromofluoromethane	*47.07*	*1.0*	*50*	*0*	*94.1*	*80 - 119*				
Surr: Toluene-d8	*51.8*	*1.0*	*50*	*0*	*104*	*89 - 112*				

LCS Sample ID: **VLCSW-210414** Units: **ug/L** Analysis Date: **14-Apr-2021 22:58**
Client ID: Run ID: **VOA6_381632** SeqNo: **6042310** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	18.72	1.0	20	0	93.6	71 - 131				
1,2-Dichloroethane	19.8	1.0	20	0	99.0	73 - 128				
cis-1,2-Dichloroethene	20.53	1.0	20	0	103	78 - 123				
Tetrachloroethene	16.47	1.0	20	0	82.4	74 - 129				
Trichloroethene	19.56	1.0	20	0	97.8	79 - 123				
Vinyl chloride	21.37	1.0	20	0	107	58 - 137				
Surr: 1,2-Dichloroethane-d4	*55.74*	*1.0*	*50*	*0*	*111*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.4*	*1.0*	*50*	*0*	*96.8*	*85 - 114*				
Surr: Dibromofluoromethane	*51.88*	*1.0*	*50*	*0*	*104*	*80 - 119*				
Surr: Toluene-d8	*48.02*	*1.0*	*50*	*0*	*96.0*	*89 - 112*				

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021
WorkOrder: HS21040286

QC BATCH REPORT

Batch ID: R381632 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21040286-08MS** Units: **ug/L** Analysis Date: **15-Apr-2021 02:50**
Client ID: **50WW06-210406** Run ID: **VOA6_381632** SeqNo: **6042320** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1-Dichloroethene	21.28	1.0	20	0	106	71 - 131				
1,2-Dichloroethane	19.02	1.0	20	0	95.1	73 - 128				
cis-1,2-Dichloroethene	19.16	1.0	20	0	95.8	78 - 123				
Tetrachloroethene	21.14	1.0	20	0	106	74 - 129				
Trichloroethene	23.92	1.0	20	3.137	104	79 - 123				
Vinyl chloride	21.97	1.0	20	0	110	58 - 137				
Surr: 1,2-Dichloroethane-d4	*51.12*	*1.0*	*50*	*0*	*102*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.42*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*49.33*	*1.0*	*50*	*0*	*98.7*	*80 - 119*				
Surr: Toluene-d8	*51.05*	*1.0*	*50*	*0*	*102*	*89 - 112*				

MSD Sample ID: **HS21040286-08MSD** Units: **ug/L** Analysis Date: **15-Apr-2021 03:11**
Client ID: **50WW06-210406** Run ID: **VOA6_381632** SeqNo: **6042321** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1-Dichloroethene	19.08	1.0	20	0	95.4	71 - 131	21.28	10.9	20	
1,2-Dichloroethane	19.83	1.0	20	0	99.1	73 - 128	19.02	4.17	20	
cis-1,2-Dichloroethene	19	1.0	20	0	95.0	78 - 123	19.16	0.837	20	
Tetrachloroethene	20.29	1.0	20	0	101	74 - 129	21.14	4.11	20	
Trichloroethene	23.47	1.0	20	3.137	102	79 - 123	23.92	1.88	20	
Vinyl chloride	20.17	1.0	20	0	101	58 - 137	21.97	8.54	20	
Surr: 1,2-Dichloroethane-d4	*50.84*	*1.0*	*50*	*0*	*102*	*81 - 118*	*51.12*	*0.554*	*20*	
Surr: 4-Bromofluorobenzene	*50.97*	*1.0*	*50*	*0*	*102*	*85 - 114*	*51.42*	*0.875*	*20*	
Surr: Dibromofluoromethane	*48.43*	*1.0*	*50*	*0*	*96.9*	*80 - 119*	*49.33*	*1.83*	*20*	
Surr: Toluene-d8	*51.37*	*1.0*	*50*	*0*	*103*	*89 - 112*	*51.05*	*0.62*	*20*	

The following samples were analyzed in this batch: HS21040286-01 HS21040286-02 HS21040286-03 HS21040286-04 HS21040286-08 HS21040286-09 HS21040286-10

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021
WorkOrder: HS21040286

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
Trichloroethene	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
Trichloroethene	20.8	1.0	20	0	104	79 - 123				
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*				

MS Sample ID: **HS21040695-04MS** Units: **ug/L** Analysis Date: **16-Apr-2021 00:07**
Client ID: 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
Trichloroethene	40.1	1.0	20	16.8	116	79 - 123				
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*				

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021
WorkOrder: HS21040286

QC BATCH REPORT

Batch ID: R381740 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS21040695-04MSD** Units: **ug/L** Analysis Date: **16-Apr-2021 00:28**
Client ID: 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
Trichloroethene	36.64	1.0	20	16.8	99.2	79 - 123	40.1	9.01	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: HS21040286-01 HS21040286-02 HS21040286-05 HS21040286-06 HS21040286-07

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021
WorkOrder: HS21040286

QC BATCH REPORT

Batch ID: R381942 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **MBLK4-04192021** Units: **mg/L** Analysis Date: **20-Apr-2021 00:52**
Client ID: Run ID: **TOC_04_381942** SeqNo: **6050285** 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: **LCS4-04192021** Units: **mg/L** Analysis Date: **20-Apr-2021 01:07**
Client ID: Run ID: **TOC_04_381942** SeqNo: **6050286** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.33	1.00	10	0	103	85 - 115				

LCSD Sample ID: **LCSD4-04192021** Units: **mg/L** Analysis Date: **20-Apr-2021 01:23**
Client ID: Run ID: **TOC_04_381942** SeqNo: **6050287** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.882	1.00	10	0	98.8	85 - 115	10.33	4.43	20	

MS Sample ID: **HS21040286-08MS** Units: **mg/L** Analysis Date: **20-Apr-2021 02:54**
Client ID: **50WW06-210406** Run ID: **TOC_04_381942** SeqNo: **6050293** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	11.54	1.00	10	1.572	99.7	80 - 120				

The following samples were analyzed in this batch: HS21040286-04 HS21040286-05 HS21040286-06 HS21040286-07 HS21040286-08 HS21040286-09

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021
WorkOrder: HS21040286

QC BATCH REPORT

Batch ID: R382075 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **08-Apr-2021 04:42**
Client ID: Run ID: **ICS-Integrion_382075** SeqNo: **6053411** 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
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **08-Apr-2021 05:00**
Client ID: Run ID: **ICS-Integrion_382075** SeqNo: **6053412** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.1	0.500	20	0	95.5	80 - 120				
Nitrogen, Nitrate (As N)	3.786	0.100	4	0	94.6	80 - 120				
Sulfate	19.29	0.500	20	0	96.5	80 - 120				

MS Sample ID: **HS21040286-08MS** Units: **mg/L** Analysis Date: **08-Apr-2021 01:56**
Client ID: **50WW06-210406** Run ID: **ICS-Integrion_382075** SeqNo: **6053406** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	13.05	0.500	10	3.422	96.3	80 - 120				
Nitrogen, Nitrate (As N)	2.003	0.100	2	0	100	80 - 120				
Sulfate	20.1	0.500	10	10.88	92.2	80 - 120				

MSD Sample ID: **HS21040286-08MSD** Units: **mg/L** Analysis Date: **08-Apr-2021 02:15**
Client ID: **50WW06-210406** Run ID: **ICS-Integrion_382075** SeqNo: **6053407** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	12.98	0.500	10	3.422	95.6	80 - 120	13.05	0.576	20	
Nitrogen, Nitrate (As N)	1.998	0.100	2	0	99.9	80 - 120	2.003	0.27	20	
Sulfate	19.99	0.500	10	10.88	91.1	80 - 120	20.1	0.549	20	

The following samples were analyzed in this batch: HS21040286-04 HS21040286-05 HS21040286-06 HS21040286-07 HS21040286-08 HS21040286-09

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021
WorkOrder: HS21040286

QC BATCH REPORT

Batch ID: R382085 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **21-Apr-2021 06:52**
Client ID: Run ID: **ICS-Integrion_382085** SeqNo: **6053709** 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
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **21-Apr-2021 07:11**
Client ID: Run ID: **ICS-Integrion_382085** SeqNo: **6053710** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	18.91	0.500	20	0	94.6	80 - 120				
Sulfate	18.85	0.500	20	0	94.3	80 - 120				

MS Sample ID: **HS21040321-01MS** Units: **mg/L** Analysis Date: **21-Apr-2021 13:15**
Client ID: Run ID: **ICS-Integrion_382085** SeqNo: **6053723** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	722.4	10.0	200	553.4	84.5	80 - 120				
Sulfate	218.8	10.0	200	28.13	95.3	80 - 120				

MSD Sample ID: **HS21040321-01MSD** Units: **mg/L** Analysis Date: **21-Apr-2021 13:34**
Client ID: Run ID: **ICS-Integrion_382085** SeqNo: **6053724** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	722.2	10.0	200	553.4	84.4	80 - 120	722.4	0.0249	20	
Sulfate	219.1	10.0	200	28.13	95.5	80 - 120	218.8	0.144	20	

The following samples were analyzed in this batch: HS21040286-04 HS21040286-05 HS21040286-06 HS21040286-07 HS21040286-09

ALS Houston, US Date: 27-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP50 April 2021
WorkOrder: **HS21040286**

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
California	2919, 2020-2021	30-Apr-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	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2021	31-Dec-2021
North Dakota	R-193 2020-2021	30-Apr-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-20-26	30-Apr-2021
Texas	T104704231-21-27	30-Apr-2022

ALS Houston, US Date: 27-Apr-21

Sample Receipt Checklist

Work Order ID: HS21040286 **Date/Time Received:** **07-Apr-2021 10:30**

Client Name: CBI-Houston **Received by:** **Jared R. Makan**

Completed By:	/S/ Pablo Marinez	07-Apr-2021 14:48	**Reviewed by:**	/S/ RJ Modashia	07-Apr-2021 20:12
	eSignature	Date/Time		eSignature	Date/Time

Matrices: **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 ☐	1 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):	1.8°C UC/C	IR 31	
Cooler(s)/Kit(s):	46755		
Date/Time sample(s) sent to storage:	4/7/21 14:55		
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

REVISED 4/14/2021

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

HS21040286

Aptim Environmental & Infrastucture, Inc.

Longhorn Army Ammunition Plant LHAAP50 April 20

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS

Project No. 501032

Job: **LHAAP50 April 2021**

Prepared By: Scott Beesinger

P.O. Number

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 (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW6850	Remarks (Preservatives, etc.)	Lab I.D.#
50WW08-210405	WG	4/5/21/0845		4	X					X		
50WW05-210405	WG	4/5/21/0930		4	X					X		
50WW29-210405	WG	4/5/21/1020		4	X					X		
50WW14-210406	WG	4/6/21/0740		13	X	X	X	X	X	X		
50WW13-210406	WG	4/6/21/0830		13	X	X	X	X	X	X		
50WW11-210406	WG	4/6/21/0920		13	X	X	X	X	X	X		
50WW11-210406-FD	WG	4/6/21/0920		13	X	X	X	X	X	X		
50WW06-210406	WG	4/6/21/1015		13	X	X	X	X	X	X		

Analyses

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	4/6/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

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: LHAAP50 April 2021

Prepared By: Scott Beesinger

P.O. Number

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 (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW6850	Remarks (Preservatives, etc.)	Lab I.D.#
50WW08-210405	WG	4/5/21 / 0845		4	X					X		
50WW05-210405	WG	4/5/21 / 0930		4	X					X		
50WW29-210405	WG	4/5/21 / 1015		4	X					X		
50WW14-210406	WG	4/6/21 / 0740		13	X	X	X	X	X	X		
50WW13-210406	WG	4/6/21 / 0830		13	X	X	X	X	X	X		
50WW11-210406	WG	4/6/21 / 0920		13	X	X	X	X	X	X		
50WW11-210406-FD	WG	4/6/21 / 0920		13	X	X	X	X	X	X		
50WW06-210406	WG	4/6/21 / 1015		13	X	X	X	X	X	X		

HS21040286

Aptim Environmental & Infrastucture, Inc.

Longhorn Army Ammunition Plant LHAAP50 April 202

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	4/6/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. McLean	4/7/21	10:30							

Remarks: Cooler 46755 1.1231
Temp 1-8°C CFO

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: **LHAAP50 April 2021**

Prepared By: Scott Beesinger

P.O. Number

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 (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW6850	Remarks (Preservatives, etc.)	Lab I.D.#
SOWW06-210406-MS	WG	4/6/21/1015		13	X	X	X	X	X	X		
SOWW06-210406-MSD	WG	4/6/21/1015		13	X	X	X	X	X	X		
SOWW12-210406	WG	4/6/21/1125		13	X	X	X	X	X	X		
TRIPBLANK-210406	W	4/6/21		2	X							

HS21040286

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant LHAAP50 April 2C

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	4/6/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Anderson	4/7/21	10:30							

Remarks:
Cooler 46755 11231
Temp 1.8°C CFO

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

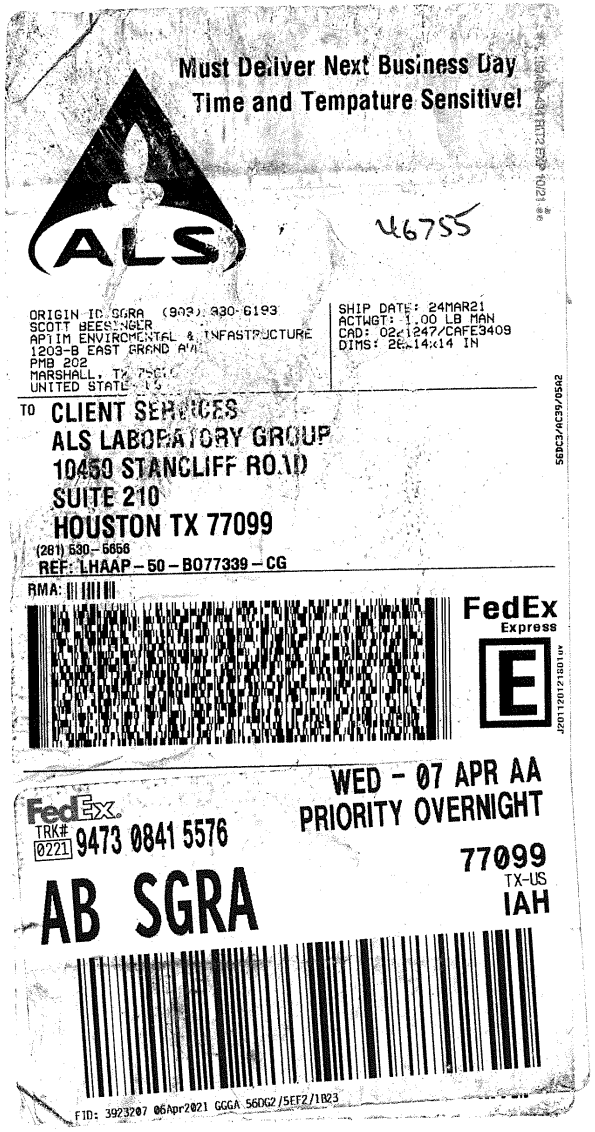
46755

CUSTODY SEAL

Date: 4/6/21 Time: 1430
Name: Scott Beesinger
Company: BHMTG

Seal Broken By: SM
Date: 04107121

46755 APR 07 2021 APR 07 2021



April 14, 2021 Service Request No:E2100369

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: HS21040286

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory April 08, 2021
For your reference, these analyses have been assigned our service request number **E2100369.**

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.:**	E2100369
Project:	HS21040286	**Date Received:**	04/08/21
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 04/08/21.

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:

EQ2100193: 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
Project: HS21040286 **Service Request:**E2100369

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100369-001	50WW08-210405	4/5/2021	0845
E2100369-002	50WW05-210405	4/5/2021	0930
E2100369-003	50WW29-210405	4/5/2021	1020
E2100369-004	50WW14-210406	4/6/2021	0740
E2100369-005	50WW13-210406	4/6/2021	0830
E2100369-006	50WW11-210406	4/6/2021	0920
E2100369-007	50WW11-210406-FD	4/6/2021	0920
E2100369-008	50WW06-210406	4/6/2021	1015
E2100369-009	50WW12-210406	4/6/2021	1125

Service Request Summary

Folder #: **E2100369**
Client Name: ALS Environmental - US
Project Name: HS21040286
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: 04/08/21
Internal Due Date: 4/21/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: hs21040286
EDD: No EDD Specified

11 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved
Location: EHRMS-WIC 10B
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100369-001	50WW08-210405	Ground Water	04/05/21 0845	**IV**
E2100369-002	50WW05-210405	Ground Water	04/05/21 0930	**IV**
E2100369-003	50WW29-210405	Ground Water	04/05/21 1020	**IV**
E2100369-004	50WW14-210406	Ground Water	04/06/21 0740	**IV**
E2100369-005	50WW13-210406	Ground Water	04/06/21 0830	**IV**
E2100369-006	50WW11-210406	Ground Water	04/06/21 0920	**IV**
E2100369-007	50WW11-210406-FD	Ground Water	04/06/21 0920	**IV**
E2100369-008	50WW06-210406	Ground Water	04/06/21 1015	**IV**
E2100369-009	50WW12-210406	Ground Water	04/06/21 1125	**IV**

Service Request Summary

Folder #: **E2100369**
Client Name: ALS Environmental - US
Project Name: HS21040286
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: 04/08/21
Internal Due Date: 4/21/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: hs21040286
EDD: No EDD Specified

11 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved
Location: EHRMS-WIC 10B
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	8	II Due 4/21,IV due 4/28
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
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
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
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
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
Tennessee Department of Environment and Concervation	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
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:** **15888**

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:	HS21040286
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21040286-01**	**50WW08-210405**	**Water**	**05 Apr 2021 08:45**
	Provide Level II and Level IV reports on a seperate pdf.			21 Apr 2021
2.	**HS21040286-02**	**50WW05-210405**	**Water**	**05 Apr 2021 09:30**
	Provide Level II and Level IV reports on a seperate pdf.			21 Apr 2021
3.	**HS21040286-03**	**50WW29-210405**	**Water**	**05 Apr 2021 10:15**
	Provide Level II and Level IV reports on a seperate pdf.			21 Apr 2021
4.	**HS21040286-04**	**50WW14-210406**	**Water**	**06 Apr 2021 07:40**
	Provide Level II and Level IV reports on a seperate pdf.			21 Apr 2021
5.	**HS21040286-05**	**50WW13-210406**	**Water**	**06 Apr 2021 08:30**
	Provide Level II and Level IV reports on a seperate pdf.			21 Apr 2021
6.	**HS21040286-06**	**50WW11-210406**	**Water**	**06 Apr 2021 09:20**
	Provide Level II and Level IV reports on a seperate pdf.			21 Apr 2021
7.	**HS21040286-07**	**50WW11-210406-FD**	**Water**	**06 Apr 2021 09:20**
	Provide Level II and Level IV reports on a seperate pdf.			21 Apr 2021
8.	**HS21040286-08**	**50WW06-210406**	**Water**	**06 Apr 2021 10:15**
	Provide Level II and Level IV reports on a seperate pdf.			21 Apr 2021
9.	**HS21040286-09**	**50WW12-210406**	**Water**	**06 Apr 2021 11:25**

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **15888**

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
	Provide Level II and Level IV reports on a seperate pdf.		21 Apr 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

SO WW06-210406
has extra volume
for MS/MSD

Relinquished By: J. MacCann Date/Time: 4/8/21 09:40

Received By: _____ Date/Time: _____

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#: 377110 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 4/8/21 10:30

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100329-001	LH18/24-SP650_033021_BIX	.01	6850/ClO4 DOD			Water	10mL	
2	E2100330-001	LH18/24-SP140_033021	.01	6850/ClO4 DOD			Water	10mL	
3	E2100331-001	LH18/24-SP650_033021_BIX	.01	6850/ClO4 DOD			Water	10mL	
4	E2100368-001	LH18/24-SP650_040621_BIX	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100369-001	50WW08-210405	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100369-002	50WW05-210405	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100369-003	50WW29-210405	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2100369-004	50WW14-210406	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2100369-005	50WW13-210406	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2100369-006	50WW11-210406	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2100369-007	50WW11-210406-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2100369-008	50WW06-210406	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2100369-009	50WW12-210406	.01	6850/ClO4 DOD			Ground Water	10mL	
14	EQ2100193-01	MB		6850/ClO4 DOD			Liquid	10mL	
15	EQ2100193-02	LCS		6850/ClO4 DOD			Liquid	10mL	
16	EQ2100193-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
17	EQ2100193-04	50WW06-210406 MS	.01	6850/ClO4 DOD			Liquid	10mL	
18	EQ2100193-05	50WW06-210406 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100193-02	1.00µL	EQ2100193-03	1.00µL	EQ2100193-04	1.00µL	EQ2100193-05	1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100329-001	100.00µL	E2100330-001	100.00µL	E2100331-001	100.00µL	E2100368-001	100.00µL	E2100369-001	100.00µL	E2100369-002	100.00µL
E2100369-003	100.00µL	E2100369-004	100.00µL	E2100369-005	100.00µL	E2100369-006	100.00µL	E2100369-007	100.00µL	E2100369-008	100.00µL
E2100369-009	100.00µL	EQ2100193-01	100.00µL	EQ2100193-02	100.00µL	EQ2100193-03	100.00µL	EQ2100193-04	100.00µL	EQ2100193-05	100.00µL

Preparation Steps

Step: Preparation
Started: 4/8/21 10:30
Finished: 4/8/21 11:30
By: GRIVERA
Comments

Preparation Information Benchsheet

Prep Run#: 377110
Team: Semivoa GCMS/GRIVERA

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 4/8/21 10:30

Comments:

Reviewed By: GR Date: 4/8/21

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:**	E2100369
Project:	HS21040286	**Date Collected:**	4/ 5/21 0845
Sample Matrix:	Ground Water	**Date Received:**	4/ 8/21
Sample Name:	50WW08-210405	**Units:**	µg/L
Lab Code:	E2100369-001	**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	**115**		1.00	0.500	0.250	10	4/ 8/21	4/13/21 15:34	377110	719570	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100369
Project:	HS21040286	**Date Collected:**	4/ 5/21 0930
Sample Matrix:	Ground Water	**Date Received:**	4/ 8/21
Sample Name:	50WW05-210405	**Units:**	µg/L
Lab Code:	E2100369-002	**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	0.100	0.0500	0.0250	1	4/ 8/21	4/13/21 15:03	377110	719570	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100369
Project:	HS21040286	**Date Collected:**	4/ 5/21 1020
Sample Matrix:	Ground Water	**Date Received:**	4/ 8/21
Sample Name:	50WW29-210405	**Units:**	µg/L
Lab Code:	E2100369-003	**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/ 8/21	4/13/21 15:11	377110	719570	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100369
Project:	HS21040286	**Date Collected:**	4/ 6/21 0740
Sample Matrix:	Ground Water	**Date Received:**	4/ 8/21
Sample Name:	50WW14-210406	**Units:**	µg/L
Lab Code:	E2100369-004	**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/ 8/21	4/13/21 15:18	377110	719570	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100369
Project:	HS21040286	**Date Collected:**	4/ 6/21 0830
Sample Matrix:	Ground Water	**Date Received:**	4/ 8/21
Sample Name:	50WW13-210406	**Units:**	µg/L
Lab Code:	E2100369-005	**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	**122**		1.00	0.500	0.250	10	4/ 8/21	4/13/21 16:54	377110	719570	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100369
Project:	HS21040286	**Date Collected:**	4/ 6/21 0920
Sample Matrix:	Ground Water	**Date Received:**	4/ 8/21
Sample Name:	50WW11-210406	**Units:**	µg/L
Lab Code:	E2100369-006	**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	**421**		2.00	1.00	0.500	20	4/ 8/21	4/13/21 17:02	377110	719570	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100369
Project:	HS21040286	**Date Collected:**	4/ 6/21 0920
Sample Matrix:	Ground Water	**Date Received:**	4/ 8/21
Sample Name:	50WW11-210406-FD	**Units:**	µg/L
Lab Code:	E2100369-007	**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	**482**		2.00	1.00	0.500	20	4/ 8/21	4/13/21 17:10	377110	719570	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100369
Project:	HS21040286	**Date Collected:**	4/ 6/21 1015
Sample Matrix:	Ground Water	**Date Received:**	4/ 8/21
Sample Name:	50WW06-210406	**Units:**	µg/L
Lab Code:	E2100369-008	**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	**0.0320**	J	0.100	0.0500	0.0250	1	4/ 8/21	4/14/21 11:08	377110	719704	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100369
Project:	HS21040286	**Date Collected:**	4/ 6/21 1125
Sample Matrix:	Ground Water	**Date Received:**	4/ 8/21
Sample Name:	50WW12-210406	**Units:**	µg/L
Lab Code:	E2100369-009	**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	**90000**		500	250	125	5000	4/ 8/21	4/13/21 17:17	377110	719570	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100369
Project:	HS21040286	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100193-01	**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/ 8/21	4/13/21 17:25	377110	719570	

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:**	E2100369
Project:	HS21040286	**Date Analyzed:**	4/13/21
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:**	NA
		Extraction Lot:	377110

	Lab Control Sample EQ2100193-02			Duplicate Lab Control Sample EQ2100193-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0958	0.100	96	0.0835	0.100	84	84 - 119	14	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:**	E2100369
Project:	HS21040286	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100193-02	**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	**0.0958**	J	0.100	0.0500	0.0250	1	4/ 8/21	4/13/21 12:55	377110	719570	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100369
Project:	HS21040286	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100193-03	**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	**0.0835**	J	0.100	0.0500	0.0250	1	4/ 8/21	4/13/21 13:27	377110	719570	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100369
Project:	HS21040286	**Date Collected:**	4/6/21
Sample Matrix:	Ground Water	**Date Received:**	4/8/21
		Date Analyzed:	4/13/21

Matrix Spike Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	50WW06-210406	**Units:**	µg/L
Lab Code:	E2100369-008	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		50WW06-210406MS				50WW06-210406DMS					
		Matrix Spike				**Duplicate Matrix Spike**					
		EQ2100193-04				EQ2100193-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**		**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0320	0.131	0.100	99		0.149	0.100	117	84 - 119	13	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:**	E2100369
Project:	HS21040286	**Date Collected:**	4/ 6/21 1015
Sample Matrix:	Ground Water	**Date Received:**	4/ 8/21
Sample Name:	50WW06-210406	**Units:**	µg/L
Lab Code:	EQ2100193-04	**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	**0.131**		0.100	0.0500	0.0250	1	4/ 8/21	4/13/21 13:43	377110	719570	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100369
Project:	HS21040286	**Date Collected:**	4/ 6/21 1015
Sample Matrix:	Ground Water	**Date Received:**	4/ 8/21
Sample Name:	50WW06-210406	**Units:**	µg/L
Lab Code:	EQ2100193-05	**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	**0.149**		0.100	0.0500	0.0250	1	4/ 8/21	4/13/21 13:51	377110	719570	

LABORATORY REPORT

April 26, 2021

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road Suite 210
Houston, TX 77099-4338

RE: HS21040286

Dear RJ:

Enclosed are the results of the samples submitted to our laboratory on April 8, 2021. For your reference, these analyses have been assigned our service request number P2101844.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Hayden Akers at 6:16 pm, Apr 26, 2021

Hayden Akers
Project Manager

Client: ALS Laboratory Group Service Request No: P2101844
Project: HS21040286

CASE NARRATIVE

The samples were received intact under chain of custody on April 8, 2021 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Carbon Dioxide Analysis

The samples were analyzed for carbon dioxide using a gas chromatograph equipped with a thermal conductivity detector (TCD). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least four hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (carbon dioxide) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175 as described in laboratory SOP VOA-DISGAS. This analyte is included on the laboratory's NELAP and DoD-ELAP scope of accreditation.

The percent recoveries for the Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS) analyzed on April 21, 2021 was outside the DOD specified lower control criterion. The error associated with the reduced recovery equates to a potential low bias. However, the spike recovery for the analyte in question was within the laboratory control criteria. Also, a Method Reporting Limit (MRL) check standard containing the analyte of concern was analyzed and verified that instrument sensitivity was adequate to detect the analyte at the LOQ on the day of analysis. Since the sensitivity was verified and the recovery met the lab criteria, the data quality has not been significantly affected. No further corrective action was taken.

Methane, Ethene and Ethane Analysis

The samples were analyzed for methane, ethene, and ethane using a gas chromatograph equipped with a flame ionization detector (FID). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least two hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (methane, ethene and ethane) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP or DoD-ELAP accreditation.

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 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.

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2018027
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1776326
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-008
Pennsylvania DEP	http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413-19-10
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272019-10
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: ALS Laboratory Group
Service Request: P2101844
Project ID: HS21040286

Date Received: 4/8/2021
Time Received: 09:30

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - CO2	RSK 175 - Gases
50WW14-210406	P2101844-001	Water	4/6/2021	07:40	X	X
50WW13-210406	P2101844-002	Water	4/6/2021	08:30	X	X
50WW11-210406	P2101844-003	Water	4/6/2021	09:20	X	X
50WW11-210406-FD	P2101844-004	Water	4/6/2021	09:20	X	X
50WW06-210406	P2101844-005	Water	4/6/2021	10:15	X	X
50WW12-210406	P2101844-006	Water	4/6/2021	11:25	X	X

R2101844

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:** **15889**

SUBCONTRACT TO:

ALS Environmental
2655 Park Center Drive, Suite A
Simi Valley, CA 93065 **Phone:** +1 805 526 7161

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:	HS21040286
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21040286-04**	**50WW14-210406**	**Water**	**06 Apr 2021 07:40**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	21 Apr 2021
2.	**HS21040286-05**	**50WW13-210406**	**Water**	**06 Apr 2021 08:30**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	21 Apr 2021
3.	**HS21040286-06**	**50WW11-210406**	**Water**	**06 Apr 2021 09:20**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	21 Apr 2021
4.	**HS21040286-07**	**50WW11-210406-FD**	**Water**	**06 Apr 2021 09:20**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	21 Apr 2021
5.	**HS21040286-08**	**50WW06-210406**	**Water**	**06 Apr 2021 10:15**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	21 Apr 2021
6.	**HS21040286-09**	**50WW12-210406**	**Water**	**06 Apr 2021 11:25**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	21 Apr 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense**

COC ID: **15889**

Relinquished By: Patty Mann

Date/Time: 4-7-21 1600

Received By:

Date/Time: 4-8-21 0930

Cooler ID(s):

Temperature(s): 5 wet

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P2101844

Project: HS21040286

Sample(s) received on: 4/8/2021 Date opened: 4/8/2021 by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature: ° C Blank Temperature: 1° C	Wet Ice		
8	Were **custody seals** on outside of cooler/Box/Container?	☒	☐	☐
	Location of seal(s)? Cooler lid. Sealing Lid?	☒	☐	☐
	Were signature and date included?	☒	☐	☐
	Were seals intact?	☒	☐	☐
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☒	☐	☐
	Were **VOA vials** checked for presence/absence of air bubbles?	☒	☐	☐
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☒	☐
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2101844-001.01	40mL VOA NP		6		A	CB 4/21/21
P2101844-001.02	40mL VOA NP				A	
P2101844-001.03	40mL VOA NP				A	
P2101844-001.04	40ml VOA HCL		1		A	CB 4/14/21
P2101844-001.05	40ml VOA HCL				A	
P2101844-001.06	40ml VOA HCL				A	
P2101844-002.01	40mL VOA NP		6		A	CB 4/21/21
P2101844-002.02	40mL VOA NP				A	
P2101844-002.03	40mL VOA NP				A	
P2101844-002.04	40ml VOA HCL		1		A	CB 4/14/21
P2101844-002.05	40ml VOA HCL				A	
P2101844-002.06	40ml VOA HCL				A	
P2101844-003.01	40mL VOA NP		6		A	CB 4/21/21
P2101844-003.02	40mL VOA NP				A	
P2101844-003.03	40mL VOA NP				A	

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P2101844

Project: HS21040286

Sample(s) received on: 4/8/2021 Date opened: 4/8/2021 by: ADAVID

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2101844-003.04	40ml VOA HCL		1		A	CB 4/14/21
P2101844-003.05	40ml VOA HCL				A	
P2101844-003.06	40ml VOA HCL				A	
P2101844-004.01	40mL VOA NP		6		A	CB 4/21/21
P2101844-004.02	40mL VOA NP				A	
P2101844-004.03	40mL VOA NP				A	
P2101844-004.04	40ml VOA HCL		1		A	CB 4/14/21
P2101844-004.05	40ml VOA HCL				A	
P2101844-004.06	40ml VOA HCL				A	
P2101844-005.01	40mL VOA NP		5		A	CB 4/21/21
P2101844-005.02	40mL VOA NP				A	
P2101844-005.03	40mL VOA NP				A	
P2101844-005.04	40ml VOA HCL		1		A	CB 4/14/21
P2101844-005.05	40ml VOA HCL		1		A	CB 4/14/21
P2101844-005.06	40ml VOA HCL		1		A	CB 4/14/21
P2101844-005.07	40mL VOA NP				A	
P2101844-005.08	40mL VOA NP				A	
P2101844-005.09	40mL VOA NP				A	
P2101844-005.10	40mL VOA NP				A	
P2101844-005.11	40mL VOA NP				A	
P2101844-005.12	40mL VOA NP				A	
P2101844-005.13	40ml VOA HCL				A	
P2101844-005.14	40ml VOA HCL				A	
P2101844-005.15	40ml VOA HCL				A	
P2101844-005.16	40ml VOA HCL				A	
P2101844-005.17	40ml VOA HCL				A	
P2101844-005.18	40ml VOA HCL				A	
P2101844-006.01	40mL VOA NP		6		A	CB 4/21/21
P2101844-006.02	40mL VOA NP				A	
P2101844-006.03	40mL VOA NP				A	
P2101844-006.04	40ml VOA HCL		1		A	CB 4/14/21
P2101844-006.05	40ml VOA HCL				A	
P2101844-006.06	40ml VOA HCL				A	

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Project ID: **HS21040286** ALS Project ID: P2101844

Carbon Dioxide

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Connor Barrett
Matrix: Liquid
Test Notes:

Date(s) Collected: 4/6/21
Date Received: 4/8/21
Date Analyzed: 4/21/21

Client Sample ID	ALS Sample ID	Injection Volume ml(s)	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
50WW14-210406	P2101844-001	0.10	**98,000**	1,000	860	370	**L**
50WW13-210406	P2101844-002	0.10	**300,000**	1,000	860	370	**L**
50WW11-210406	P2101844-003	0.10	**310,000**	1,000	860	370	**L**
50WW11-210406-FD	P2101844-004	0.10	**300,000**	1,000	860	370	**L**
50WW06-210406	P2101844-005	0.10	**88,000**	1,000	860	370	**L**
50WW12-210406	P2101844-006	0.10	**130,000**	1,000	860	370	**L**
Method Control Sample	P210421-MB	0.10	860	1,000	860	370	**U, L**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
L = Laboratory control sample recovery outside the specified limits, results may be biased low.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample** ALS Project ID: P2101844
Client Project ID: **HS21040286** ALS Sample ID: P210421-DLCS

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/TCD Date Received: NA
Analyst: Connor Barrett Date Analyzed: 4/21/21
Matrix: Liquid Volume(s) Analyzed: NA ml(s)
Test Notes:

CAS #	Compound	Spike Amount LCS / DLCS ug/L	Result[1] LCS ug/L	Result[1] DLCS ug/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
124-38-9	Carbon Dioxide	22,900	17,200	17,900	**75**	**78**	80-122	4	12	**L**

[1] = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.
L = Laboratory control sample recovery outside the specified limits, results may be biased low.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW14-210406**
Client Project ID: **HS21040286**

ALS Project ID: P2101844
ALS Sample ID: P2101844-001

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: 04/06/21
Date Received: 04/08/21
Date Analyzed: 04/14/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**3.0**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW13-210406**
Client Project ID: **HS21040286**

ALS Project ID: P2101844
ALS Sample ID: P2101844-002

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: 04/06/21
Date Received: 04/08/21
Date Analyzed: 04/14/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**1.4**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW11-210406**
Client Project ID: **HS21040286**

ALS Project ID: P2101844
ALS Sample ID: P2101844-003

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: 04/06/21
Date Received: 04/08/21
Date Analyzed: 04/14/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**1.1**	1.3	1.0	0.51	**J**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW11-210406-FD** ALS Project ID: P2101844
Client Project ID: **HS21040286** ALS Sample ID: P2101844-004

Test Code: RSK 175 Date Collected: 04/06/21
Instrument ID: HP5890A/GC10/FID Date Received: 04/08/21
Analyst: Connor Barrett Date Analyzed: 04/14/21
Matrix: Water Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**1.7**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW06-210406**
Client Project ID: **HS21040286**

ALS Project ID: P2101844
ALS Sample ID: P2101844-005

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: 04/06/21
Date Received: 04/08/21
Date Analyzed: 04/14/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**2.6**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW12-210406**
Client Project ID: **HS21040286**

ALS Project ID: P2101844
ALS Sample ID: P2101844-006

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: 04/06/21
Date Received: 04/08/21
Date Analyzed: 04/14/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**1.5**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **Method Control Sample** ALS Project ID: P2101844
Client Project ID: **HS21040286** ALS Sample ID: P210414-MB

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/FID Date Received: NA
Analyst: Connor Barrett Date Analyzed: 4/14/21
Matrix: Water Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	**U**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **HS21040286**

ALS Project ID: P2101844
ALS Sample ID: P210414-LCS
P210414-DLCS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 4/14/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount LCS / DLCS µg/L	Result$_1$ LCS µg/L	Result$_1$ DLCS µg/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	2.52	2.70	2.34	**107**	**93**	73-125	14	26	
74-85-1	Ethene	4.40	5.10	4.89	**116**	**111**	72-133	4	11	
74-84-0	Ethane	4.72	4.97	4.84	**105**	**103**	74-131	2	10	

$_1$ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

ALS ENVIRONMENTAL

MATRIX SPIKE / DUPLICATE MATRIX SPIKE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **50WW06-210406**
Client Project ID: **HS21040286**

ALS Project ID: P2101844
ALS Sample ID: P2101844-005MS
P2101844-005DMS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: 4/6/21
Date Received: 4/8/21
Date Analyzed: 4/14/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount MS / DMS µg/L	Sample Amount µg/L	Result MS µg/L	Result DMS µg/L	% Recovery MS	% Recovery DMS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	169	2.56	144	143	**84**	**83**	73-125	1	30	
74-85-1	Ethene	294	ND	292	292	**99**	**99**	72-133	0	30	
74-84-0	Ethane	317	ND	288	288	**91**	**91**	74-131	0	30	

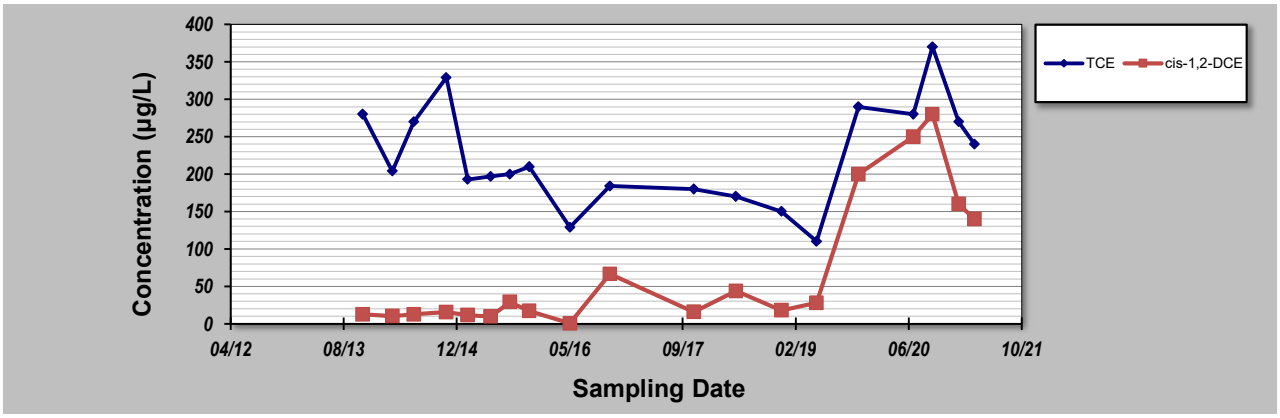
Appendix E

Mann-Kendall Trend Test Results

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	3-Sep-20	Job ID:	501032
Facility Name:	LHAAP-50	Constituent:	50WW05
Conducted By:	Jonathan Reagan	Concentration Units:	µg/L

Sampling Point ID:	TCE	cis-1,2-DCE					
Sampling Event	Sampling Date	50WW05 CONCENTRATION (µg/L)					
1	6-Nov-13	280	12.4				
2	17-Mar-14	204	10.5				
3	20-Jun-14	270	12.6				
4	11-Nov-14	329	15.7				
5	13-Feb-15	193	11.7				
6	26-May-15	197	9.81				
7	19-Aug-15	200	29.1				
8	13-Nov-15	210	17.2				
9	11-May-16	129	0.565				
10	3-Nov-16	184	66.7				
11	10-Nov-17	180	16				
12	15-May-18	170	44				
13	3-Dec-18	150	18				
14	7-May-19	110	28				
15	8-Nov-19	290	200				
16	8-Jul-20	280	250				
17	1-Oct-20	370	280				
18	25-Jan-21	270	160				
19	5-Apr-21	240	140				
20							
Coefficient of Variation:		0.31	1.28				
Mann-Kendall Statistic (S):		-13	101				
Confidence Factor:		66.1%	>99.9%				
Concentration Trend:		Stable	Increasing				



Notes:

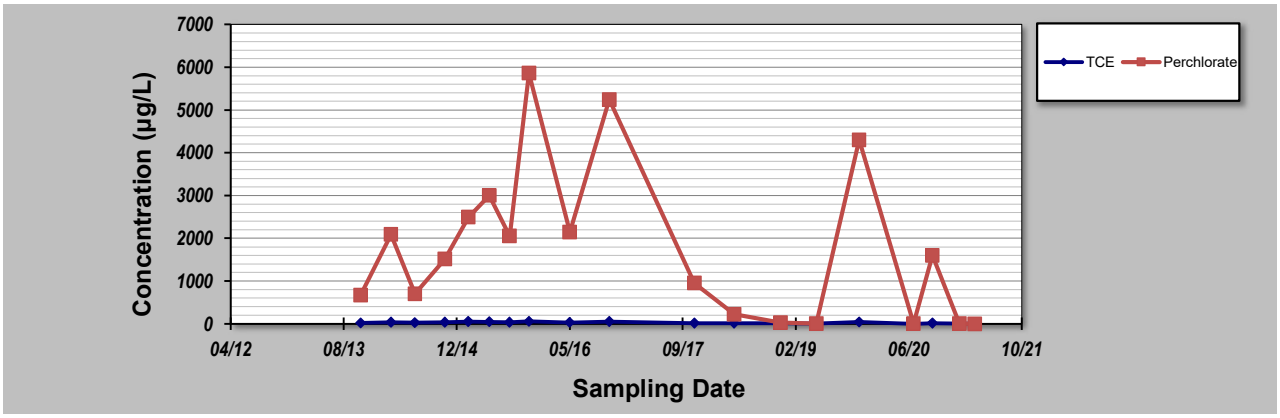
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably 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.

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-Sep-20	Job ID:	501032
Facility Name:	LHAAP-50	Constituent:	50WW06
Conducted By:	Jonathan Reagan	Concentration Units:	µg/L

Sampling Point ID:	TCE	Perchlorate					
Sampling Event	Sampling Date	50WW06 CONCENTRATION (µg/L)						
1	28-Oct-13	20.9	670					
2	11-Mar-14	36.5	2,090					
3	25-Jun-14	27.4	700					
4	4-Nov-14	36.1	1,510					
5	17-Feb-15	53.9	2,490					
6	20-May-15	49.1	3,000					
7	18-Aug-15	34.7	2,050					
8	12-Nov-15	59.4	5,860					
9	10-May-16	29.5	2,140					
10	1-Nov-16	54.2	5,240					
11	13-Nov-17	13	950					
12	8-May-18	14	220					
13	29-Nov-18	14	24					
14	6-May-19	1.4	4.3					
15	12-Nov-19	41	4300					
16	9-Jul-20	1.3	1.69					
17	1-Oct-20	14	1600					
18	28-Jan-21	4.8	2.78					
19	6-Apr-21	3.1	0.032					
20								
Coefficient of Variation:		0.71	1.04					
Mann-Kendall Statistic (S):		-68	-53					
Confidence Factor:		99.1%	96.6%					
Concentration Trend:		Decreasing	Decreasing					



Notes:

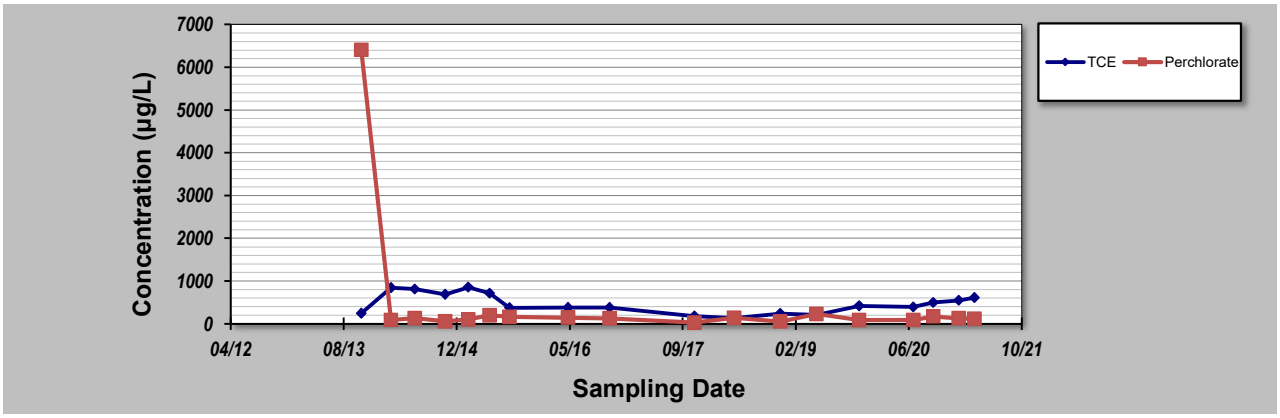
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably 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.

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-Sep-20	Job ID:	501032
Facility Name:	LHAAP-50	Constituent:	50WW08
Conducted By:	Jonathan Reagan	Concentration Units:	µg/L

Sampling Point ID:	TCE	Perchlorate					
Sampling Event	Sampling Date	50WW08 CONCENTRATION (µg/L)					
1	30-Oct-13	247	6,404				
2	11-Mar-14	845	91.5				
3	24-Jun-14	814	132				
4	6-Nov-14	685	56.3				
5	17-Feb-15	852	99				
6	21-May-15	712	200				
7	17-Aug-15	375	157				
8	3-May-16	383	146				
9	2-Nov-16	379	126				
10	13-Nov-17	180	27				
11	8-May-18	130	140				
12	28-Nov-18	240	51				
13	7-May-19	210	230				
14	12-Nov-19	420	83				
15	8-Jul-20	390	89.8				
16	5-Oct-20	500	172				
17	25-Jan-21	550	126				
18	5-Apr-21	610	115				
19							
20							
Coefficient of Variation:		0.50	3.16				
Mann-Kendall Statistic (S):		-19	-14				
Confidence Factor:		75.0%	68.7%				
Concentration Trend:		Stable	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.

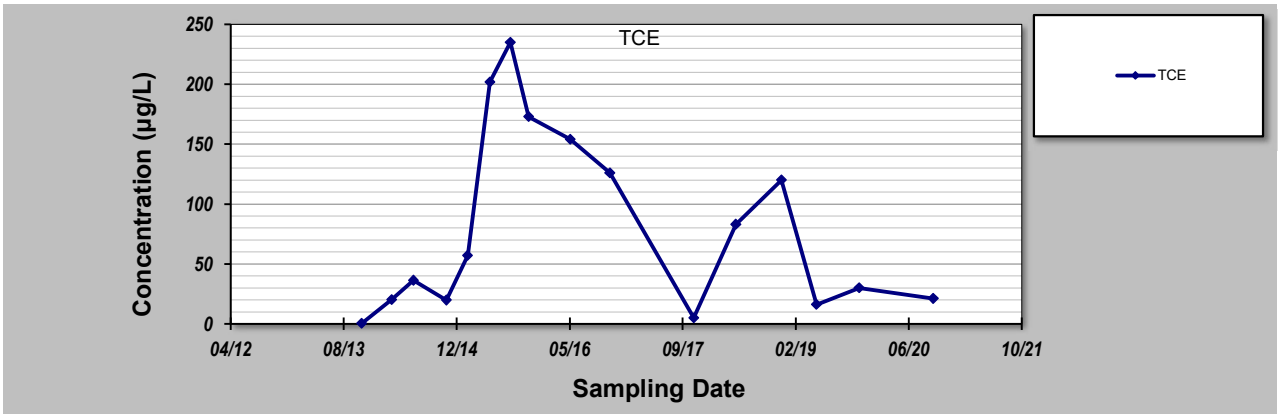
DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of 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-Sep-20	Job ID:	501032
Facility Name:	LHAAP-50	Constituent:	50WW09
Conducted By:	Jonathan Reagan	Concentration Units:	µg/L

Sampling Point ID: TCE

Sampling Event	Sampling Date	50WW09 CONCENTRATION (µg/L)
1	1-Nov-13	0.26
2	14-Mar-14	20.2
3	19-Jun-14	36.3
4	12-Nov-14	19.8
5	13-Feb-15	57
6	23-May-15	202
7	21-Aug-15	235
8	11-Nov-15	173
9	12-May-16	154
10	3-Nov-16	126
11	10-Nov-17	4.9
12	15-May-18	83
13	3-Dec-18	120
14	7-May-19	16
15	11-Nov-19	30
16	5-Oct-20	21
17		
18		
19		
20		
Coefficient of Variation:		0.95
Mann-Kendall Statistic (S):		0
Confidence Factor:		48.2%
Concentration Trend:		Stable



Notes:

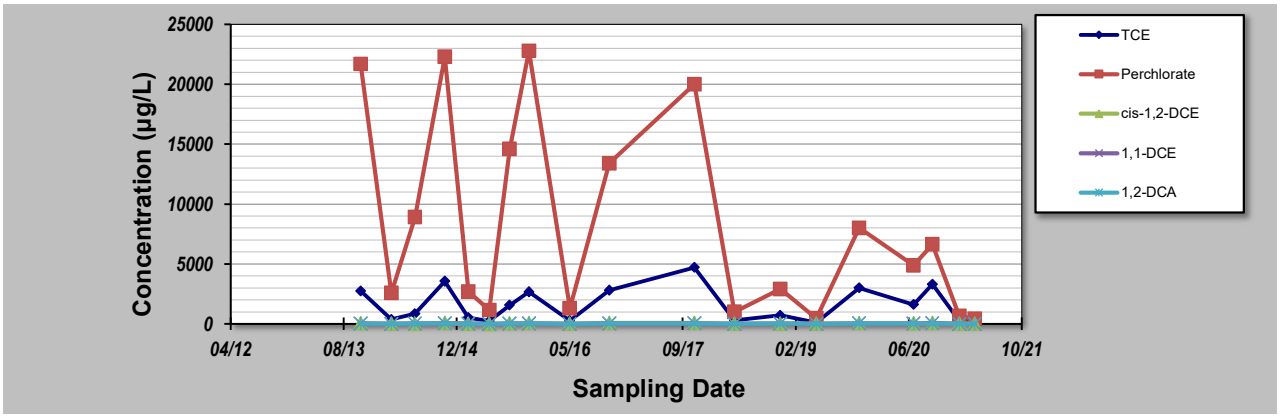
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably 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.

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-Sep-20	Job ID:	501032
Facility Name:	LHAAP-50	Constituent:	50WW11
Conducted By:	Jonathan Reagan	Concentration Units:	µg/L

Sampling Point ID:	TCE	Perchlorate	cis-1,2-DCE	1,1-DCE	1,2-DCA		
Sampling Event	Sampling Date	50WW11 CONCENTRATION (µg/L)						
1	28-Oct-13	2,750	21,700	43.9	17.4	15.2		
2	13-Mar-14	362	2,570	4.46	1.88	2.28		
3	25-Jun-14	831	8,910	12.6	7.35	6.01		
4	5-Nov-14	3,550	22,300	70.8	27.9	24.3		
5	17-Feb-15	512	2,690	6.86	2.47	2.42		
6	20-May-15	230	1,140	2.4	1.03	1.2		
7	18-Aug-15	1,550	14,600	36.3	13.1	16.7		
8	12-Nov-15	2,670	22,800	54.1	17.5	22.9		
9	10-May-16	254	1,300	5.35	1.5	1.84		
10	1-Nov-16	2,800	13,400	67.4	21.4	26.1		
11	13-Nov-17	4,700	20,000	78	33	30		
12	9-May-18	280	1,000	11	1.7	2		
13	28-Nov-18	700	2,900	18	5.5	5.6		
14	6-May-19	95	450	3.1	0.5	0.75		
15	12-Nov-19	3000	8000	58	26	28		
16	9-Jul-20	1600	4880	29	15	13		
17	1-Oct-20	3300	6630	74	35	26		
18	28-Jan-21	250	651	6.7	2.1	2.4		
19	6-Apr-21	200	421	5.3	2	1.8		
20								
Coefficient of Variation:		0.93	1.01	0.91	0.96	0.92		
Mann-Kendall Statistic (S):		-15	-57	3	5	-3		
Confidence Factor:		68.6%	97.5%	52.7%	55.5%	52.7%		
Concentration Trend:		Stable	Decreasing	No Trend	No Trend	Stable		



Notes:

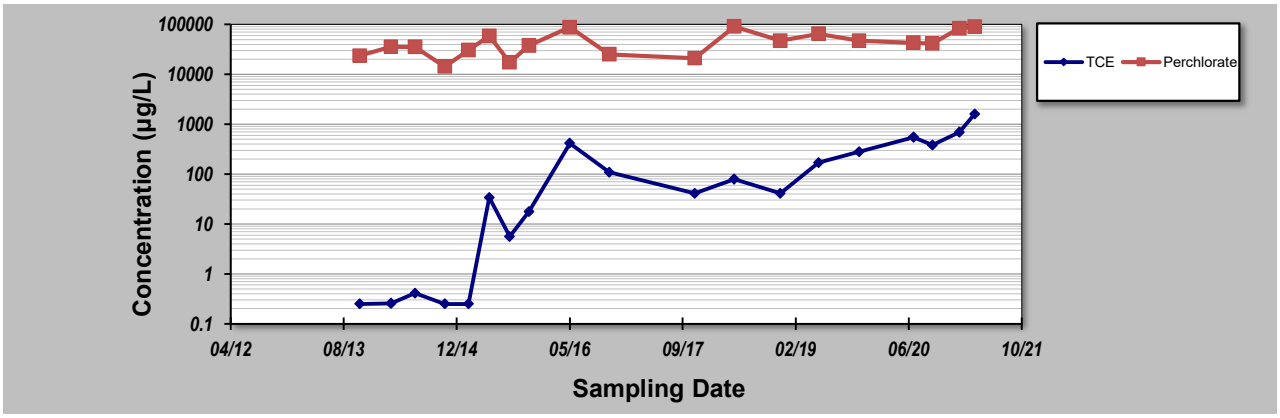
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably 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.

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-Sep-20	Job ID:	501032
Facility Name:	LHAAP-50	Constituent:	50WW12
Conducted By:	Jonathan Reagan	Concentration Units:	µg/L

Sampling Point ID:	TCE	Perchlorate					
Sampling Event	Sampling Date	50WW12 CONCENTRATION (µg/L)					
1	23-Oct-13	0.25	23,600				
2	11-Mar-14	0.257	35,700				
3	26-Jun-14	0.411	35,500				
4	4-Nov-14	0.25	14,300				
5	18-Feb-15	0.25	30,600				
6	20-May-15	33.9	59,200				
7	18-Aug-15	5.59	17,300				
8	12-Nov-15	17.6	37,900				
9	10-May-16	417	87,800				
10	1-Nov-16	109	25,300				
11	14-Nov-17	41	21,000				
12	8-May-18	79	91,000				
13	28-Nov-18	41	47,000				
14	16-May-19	170	65,000				
15	12-Nov-19	280	47000				
16	9-Jul-20	550	43000				
17	1-Oct-20	380	41600				
18	28-Jan-21	690	83800				
19	6-Apr-21	1600	90000				
20							
Coefficient of Variation:		1.69	0.54				
Mann-Kendall Statistic (S):		131	68				
Confidence Factor:		>99.9%	99.1%				
Concentration Trend:		Increasing	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.

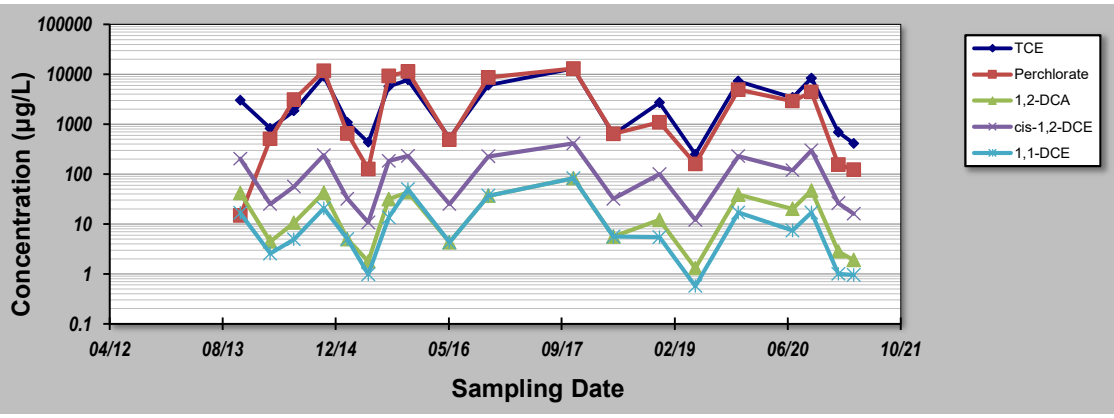
DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of 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 Environmental Inc., www.gsi-net.com

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	3-Sep-20	Job ID:	501032
Facility Name:	LHAAP-50	Constituent:	50WW13
Conducted By:	Jonathan Reagan	Concentration Units:	µg/L

Sampling Point ID:	TCE	Perchlorate	1,2-DCA	cis-1,2-DCE	1,1-DCE		
Sampling Event	Sampling Date	50WW13 CONCENTRATION (µg/L)						
1	30-Oct-13	3,000	15	42	205	16.6		
2	12-Mar-14	823	510	4	25	2.54		
3	25-Jun-14	1,840	3,110	11	56	4.95		
4	5-Nov-14	9,150	11,700	42	239	20.6		
5	17-Feb-15	1,080	648	5	32	5		
6	20-May-15	433	126	2	11	0.978		
7	19-Aug-15	5,700	9,300	32	184	13.5		
8	12-Nov-15	7,710	11,400	43	231	50		
9	13-May-16	529	493	4	25	4.31		
10	1-Nov-16	6,050	8,650	37	228	36.7		
11	13-Nov-17	13,000	13,000	83	410	83		
12	9-May-18	620	640	6	32	5.6		
13	29-Nov-18	2,700	1,100	12	100	5.4		
14	6-May-19	250	160	1.3	12	0.57		
15	13-Nov-19	7300	4900	39	230	17		
16	9-Jul-20	3400	2900	20	120	7.4		
17	1-Oct-20	8300	4390	47	300	17		
18	28-Jan-21	690	155	2.8	26	1		
19	6-Apr-21	410	122	1.9	16	0.95		
20								
Coefficient of Variation:		0.99	1.19	0.99	0.91	1.36		
Mann-Kendall Statistic (S):		-9	-11	-11	-4	-12		
Confidence Factor:		60.9%	63.5%	63.5%	54.1%	64.8%		
Concentration Trend:		Stable	No Trend	Stable	Stable	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.

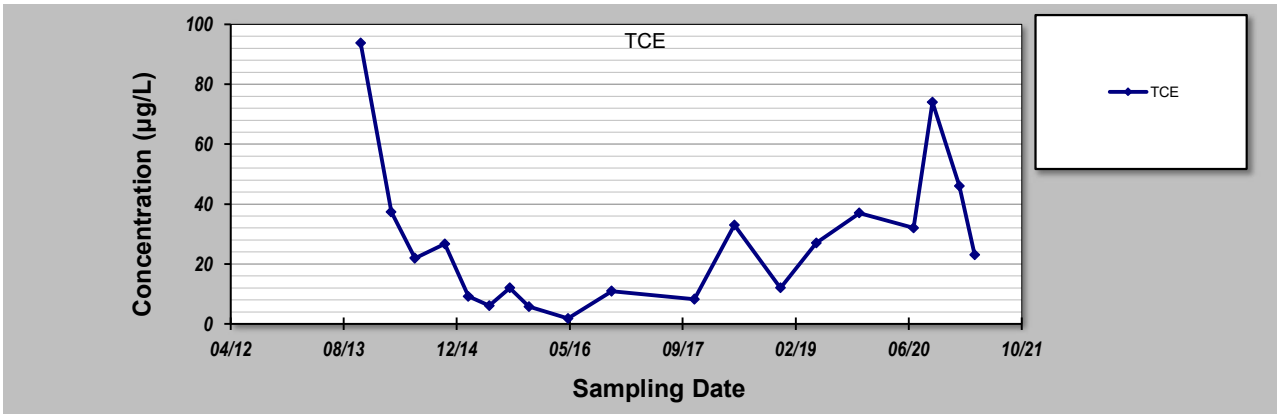
DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of 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-Sep-20	Job ID:	501032
Facility Name:	LHAAP-50	Constituent:	50WW14
Conducted By:	Jonathan Reagan	Concentration Units:	µg/L

Sampling Point ID:	TCE						

Sampling Event	Sampling Date	50WW14 CONCENTRATION (µg/L)						
1	28-Oct-13	93.8						
2	12-Mar-14	37.4						
3	25-Jun-14	21.9						
4	5-Nov-14	26.7						
5	17-Feb-15	9.14						
6	20-May-15	6.05						
7	19-Aug-15	12						
8	12-Nov-15	5.78						
9	3-May-16	1.75						
10	12-Nov-16	10.9						
11	13-Nov-17	8.2						
12	9-May-18	33						
13	29-Nov-18	12						
14	6-May-19	27						
15	13-Nov-19	37						
16	9-Jul-20	32						
17	1-Oct-20	74						
18	28-Jan-21	46						
19	6-Apr-21	23						
20								
Coefficient of Variation:		0.88						
Mann-Kendall Statistic (S):		24						
Confidence Factor:		78.7%						
Concentration Trend:		No Trend						



Notes:

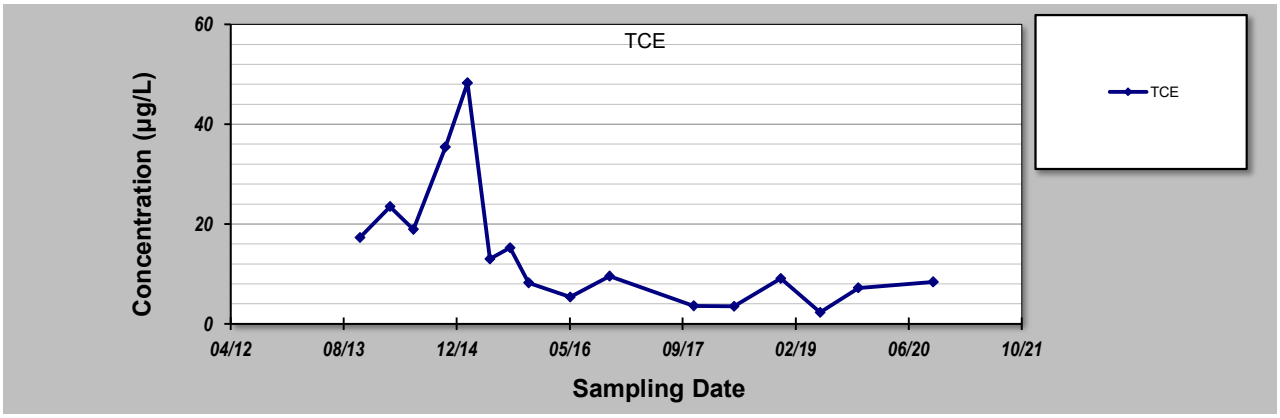
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably 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.

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-Sep-20	Job ID:	501032
Facility Name:	LHAAP-50	Constituent:	50WW15
Conducted By:	Jonathan Reagan	Concentration Units:	µg/L

Sampling Point ID:	TCE						
Sampling Event	Sampling Date	50WW15 CONCENTRATION (µg/L)						
1	25-Oct-13	17.3						
2	7-Mar-14	23.5						
3	19-Jun-14	18.9						
4	7-Nov-14	35.4						
5	12-Feb-15	48.3						
6	23-May-15	13						
7	20-Aug-15	15.2						
8	11-Nov-15	8.2						
9	12-May-16	5.32						
10	2-Nov-16	9.52						
11	10-Nov-17	3.6						
12	7-May-18	3.5						
13	30-Nov-18	9.1						
14	23-May-19	2.3						
15	8-Nov-19	7.2						
16	5-Oct-20	8.4						
17								
18								
19								
20								
Coefficient of Variation:		0.87						
Mann-Kendall Statistic (S):		-68						
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.

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.*

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

WorkOrder: HS20100074

LHAAP50 October 2020

Aptim Environmental & Infrastucture, Inc.

Susan Huang
2500 City West Blvd., Suite 1700
Houston TX 77042

26-Oct-2020

ALS Environmental
ALS Group USA, Corp
10450 Stancliff Road, Suite 210
Houston, TX 77099
T : +1 281 530 5656
F : +1 281 530 5887
www.alsglobal.com

Table of Contents

HS20100074 Cover Page
- CoverPage
- HS20100074 LHAAP50 October 2020 Final
  - CoverLetter
  - Sample Summary
  - CaseNarrative
  - 50WW14-201001
  - 50WW13-201001
  - 50WW11-201001
  - 50WW11-201001-FD
  - 50WW06-201001
  - 50WW12-201001
  - Dates Report
  - QC
  - Acronyms
  - Certifications
  - SampleReceiptCheckList
  - COC
  - HS20100074 - Sub Perch Report IV (E2000944)
  - HS20100074 ALS Kelso Sub Data Report K2008877
  - HS20100074 ALS Simi Valley CA SUB Data_P2005613 Tier IV
- HS20100074 8260_W_DOD Raw Data

Table of Contents (continued)

HS20100074 Wet Chem Raw Data (9056_anions_W)

HS20100074 LHAAP50 October 2020 Final

ALS WO# HS20100074

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

October 16, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS20100074**

Laboratory Results for: **LHAAP50 October 2020**

Dear Susan Huang,

ALS Environmental received 6 sample(s) on Oct 02, 2020 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: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
Work Order: HS20100074

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20100074-01	50WW14-201001	Groundwater		01-Oct-2020 07:55	02-Oct-2020 09:40	☐
HS20100074-02	50WW13-201001	Groundwater		01-Oct-2020 09:05	02-Oct-2020 09:40	☐
HS20100074-03	50WW11-201001	Groundwater		01-Oct-2020 09:55	02-Oct-2020 09:40	☐
HS20100074-04	50WW11-201001-FD	Groundwater		01-Oct-2020 09:55	02-Oct-2020 09:40	☐
HS20100074-05	50WW06-201001	Groundwater		01-Oct-2020 10:50	02-Oct-2020 09:40	☐
HS20100074-06	50WW12-201001	Groundwater		01-Oct-2020 11:40	02-Oct-2020 09:40	☐

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP50 October 2020
Work Order: HS20100074

Work Order Comments

- The analysis for Methane, Methene, Ethane and CO2 by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.
- The analysis for Perchlorate was subcontracted to our ALS Houston TX, High Resolution Lab. Final report attached.

Work Order Comments

- The analysis for TOC was subcontracted to our ALS Environmental in Kelso, WA. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R370035

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Batch ID: R369947

Sample ID: 50WW14-201001 (HS20100074-01MS)

- MS/MSD recovered outside control limits for Trichloroethene

WetChemistry by Method SW9056

Batch ID: R369813

Sample ID: 50WW12-201001 (HS20100074-06)

- Sample ran at 2x due to high concentration of sulfate.

Sample ID: 50WW14-201001 (HS20100074-01MS)

- 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,Sulfate)

Sample ID: HS20100055-04MS

- MS and MSD are for an unrelated sample (Chloride,Sulfate)

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
Sample ID: 50WW14-201001
Collection Date: 01-Oct-2020 07:55

ANALYTICAL REPORT
WorkOrder:HS20100074
Lab ID:HS20100074-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Oct-2020 15:49
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Oct-2020 15:49
cis-1,2-Dichloroethene	**2.9**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 15:49
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Oct-2020 15:49
Trichloroethene	**74**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 15:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	06-Oct-2020 15:49
Surr: 1,2-Dichloroethane-d4	*92.3*			**0**	*81-118*	*%REC*	*1*	*06-Oct-2020 15:49*
Surr: 4-Bromofluorobenzene	*107*			**0**	*85-114*	*%REC*	*1*	*06-Oct-2020 15:49*
Surr: Dibromofluoromethane	*94.8*			**0**	*80-119*	*%REC*	*1*	*06-Oct-2020 15:49*
Surr: Toluene-d8	*98.2*			**0**	*89-112*	*%REC*	*1*	*06-Oct-2020 15:49*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Chloride	**393**		**4.00**	**10.0**	**10.0**	**mg/L**	20	02-Oct-2020 20:40
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	02-Oct-2020 17:39
Sulfate	**375**		**4.00**	**10.0**	**10.0**	**mg/L**	20	02-Oct-2020 20:40
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 14:14
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	08-Oct-2020 17:46
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 18:49

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

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP50 October 2020
Sample ID: 50WW13-201001
Collection Date: 01-Oct-2020 09:05

ANALYTICAL REPORT
WorkOrder:HS20100074
Lab ID:HS20100074-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**17**		**1.0**	**2.5**	**5.0**	**UG/L**	5	06-Oct-2020 22:38
1,2-Dichloroethane	**47**		**1.0**	**2.5**	**5.0**	**UG/L**	5	06-Oct-2020 22:38
cis-1,2-Dichloroethene	**300**		**1.0**	**2.5**	**5.0**	**UG/L**	5	06-Oct-2020 22:38
Tetrachloroethene	**8.6**		**1.5**	**2.5**	**5.0**	**UG/L**	5	06-Oct-2020 22:38
Trichloroethene	**8,300**		**10**	**25**	**50**	**UG/L**	50	06-Oct-2020 23:02
Vinyl chloride	**3.3**	J	**1.0**	**2.5**	**5.0**	**UG/L**	5	06-Oct-2020 22:38
Surr: 1,2-Dichloroethane-d4	*93.4*			**0**	*81-118*	*%REC*	*5*	*06-Oct-2020 22:38*
Surr: 1,2-Dichloroethane-d4	*90.0*			**0**	*81-118*	*%REC*	*50*	*06-Oct-2020 23:02*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*5*	*06-Oct-2020 22:38*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*50*	*06-Oct-2020 23:02*
Surr: Dibromofluoromethane	*93.4*			**0**	*80-119*	*%REC*	*50*	*06-Oct-2020 23:02*
Surr: Dibromofluoromethane	*95.7*			**0**	*80-119*	*%REC*	*5*	*06-Oct-2020 22:38*
Surr: Toluene-d8	*96.8*			**0**	*89-112*	*%REC*	*5*	*06-Oct-2020 22:38*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*50*	*06-Oct-2020 23:02*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Chloride	**316**		**4.00**	**10.0**	**10.0**	**mg/L**	20	02-Oct-2020 20:58
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	02-Oct-2020 17:57
Sulfate	**356**		**4.00**	**10.0**	**10.0**	**mg/L**	20	02-Oct-2020 20:58
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 14:14
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	08-Oct-2020 17:46
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 18:49

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

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
Sample ID: 50WW11-201001
Collection Date: 01-Oct-2020 09:55

ANALYTICAL REPORT
WorkOrder:HS20100074
Lab ID:HS20100074-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**35**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 16:13
1,2-Dichloroethane	**26**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 16:13
cis-1,2-Dichloroethene	**74**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 16:13
Tetrachloroethene	**6.8**		**0.30**	**1.0**	**1.0**	**UG/L**	1	06-Oct-2020 16:13
Trichloroethene	**3,300**		**10**	**25**	**50**	**UG/L**	50	06-Oct-2020 17:49
Vinyl chloride	**3.4**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 16:13
Surr: 1,2-Dichloroethane-d4	*91.5*			**0**	*81-118*	*%REC*	*1*	*06-Oct-2020 16:13*
Surr: 1,2-Dichloroethane-d4	*91.5*			**0**	*81-118*	*%REC*	*50*	*06-Oct-2020 17:49*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*50*	*06-Oct-2020 17:49*
Surr: 4-Bromofluorobenzene	*108*			**0**	*85-114*	*%REC*	*1*	*06-Oct-2020 16:13*
Surr: Dibromofluoromethane	*95.4*			**0**	*80-119*	*%REC*	*50*	*06-Oct-2020 17:49*
Surr: Dibromofluoromethane	*95.3*			**0**	*80-119*	*%REC*	*1*	*06-Oct-2020 16:13*
Surr: Toluene-d8	*96.7*			**0**	*89-112*	*%REC*	*1*	*06-Oct-2020 16:13*
Surr: Toluene-d8	*98.7*			**0**	*89-112*	*%REC*	*50*	*06-Oct-2020 17:49*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Chloride	**305**		**4.00**	**10.0**	**10.0**	**mg/L**	20	02-Oct-2020 21:16
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	02-Oct-2020 18:15
Sulfate	**475**		**4.00**	**10.0**	**10.0**	**mg/L**	20	02-Oct-2020 21:16
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 14:14
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	08-Oct-2020 17:46
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 18:49

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

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
Sample ID: 50WW11-201001-FD
Collection Date: 01-Oct-2020 09:55

ANALYTICAL REPORT
WorkOrder:HS20100074
Lab ID:HS20100074-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**34**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 16:37
1,2-Dichloroethane	**25**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 16:37
cis-1,2-Dichloroethene	**74**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 16:37
Tetrachloroethene	**7.1**		**0.30**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 16:37
Trichloroethene	**3,500**		**10**	**25**	**50**	**UG/L**	50	06-Oct-2020 18:13
Vinyl chloride	**3.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 16:37
Surr: 1,2-Dichloroethane-d4	*90.7*			**0**	*81-118*	*%REC*	*1*	*06-Oct-2020 16:37*
Surr: 1,2-Dichloroethane-d4	*92.4*			**0**	*81-118*	*%REC*	*50*	*06-Oct-2020 18:13*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*1*	*06-Oct-2020 16:37*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*50*	*06-Oct-2020 18:13*
Surr: Dibromofluoromethane	*94.0*			**0**	*80-119*	*%REC*	*50*	*06-Oct-2020 18:13*
Surr: Dibromofluoromethane	*93.3*			**0**	*80-119*	*%REC*	*1*	*06-Oct-2020 16:37*
Surr: Toluene-d8	*98.6*			**0**	*89-112*	*%REC*	*50*	*06-Oct-2020 18:13*
Surr: Toluene-d8	*95.5*			**0**	*89-112*	*%REC*	*1*	*06-Oct-2020 16:37*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Chloride	**301**		**4.00**	**10.0**	**10.0**	**mg/L**	20	02-Oct-2020 21:34
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	02-Oct-2020 19:09
Sulfate	**403**		**4.00**	**10.0**	**10.0**	**mg/L**	20	02-Oct-2020 21:34
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 14:14
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	08-Oct-2020 17:46
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 18:49

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

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
Sample ID: 50WW06-201001
Collection Date: 01-Oct-2020 10:50

ANALYTICAL REPORT
WorkOrder:HS20100074
Lab ID:HS20100074-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Oct-2020 21:50
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Oct-2020 21:50
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Oct-2020 21:50
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Oct-2020 21:50
Trichloroethene	**14**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 21:50
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	06-Oct-2020 21:50
Surr: 1,2-Dichloroethane-d4	*90.0*			**0**	*81-118*	*%REC*	*1*	*06-Oct-2020 21:50*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*06-Oct-2020 21:50*
Surr: Dibromofluoromethane	*93.8*			**0**	*80-119*	*%REC*	*1*	*06-Oct-2020 21:50*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*06-Oct-2020 21:50*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Chloride	**41.8**		**0.200**	**0.500**	**0.500**	**mg/L**	1	02-Oct-2020 19:28
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	02-Oct-2020 19:28
Sulfate	**17.9**		**0.200**	**0.500**	**0.500**	**mg/L**	1	02-Oct-2020 19:28
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 14:14
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	08-Oct-2020 17:46
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 18:49

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

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP50 October 2020 WorkOrder:HS20100074
Sample ID: 50WW12-201001 Lab ID:HS20100074-06
Collection Date: 01-Oct-2020 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-Dichloroethene	**5.2**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 22:14
1,2-Dichloroethane	**3.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 22:14
cis-1,2-Dichloroethene	**0.87**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Oct-2020 22:14
Tetrachloroethene	1.0	U	0.30	1.0	1.0	UG/L	1	06-Oct-2020 22:14
Trichloroethene	**380**		**2.0**	**5.0**	**10**	**UG/L**	10	07-Oct-2020 19:36
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	06-Oct-2020 22:14
Surr: 1,2-Dichloroethane-d4	*90.4*			**0**	*81-118*	*%REC*	*1*	*06-Oct-2020 22:14*
Surr: 1,2-Dichloroethane-d4	*90.6*			**0**	*81-118*	*%REC*	*10*	*07-Oct-2020 19:36*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*1*	*06-Oct-2020 22:14*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*10*	*07-Oct-2020 19:36*
Surr: Dibromofluoromethane	*93.5*			**0**	*80-119*	*%REC*	*1*	*06-Oct-2020 22:14*
Surr: Dibromofluoromethane	*92.9*			**0**	*80-119*	*%REC*	*10*	*07-Oct-2020 19:36*
Surr: Toluene-d8	*99.4*			**0**	*89-112*	*%REC*	*1*	*06-Oct-2020 22:14*
Surr: Toluene-d8	*98.3*			**0**	*89-112*	*%REC*	*10*	*07-Oct-2020 19:36*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Chloride	**1,080**		**20.0**	**50.0**	**50.0**	**mg/L**	100	02-Oct-2020 21:52
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	02-Oct-2020 19:46
Sulfate	**595**		**20.0**	**50.0**	**50.0**	**mg/L**	100	02-Oct-2020 21:52
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 14:14
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	08-Oct-2020 17:46
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	16-Oct-2020 18:49

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

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: HS20100074

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R369813 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20100074-01	50WW14-201001	01 Oct 2020 07:55			02 Oct 2020 20:40	20
HS20100074-01	50WW14-201001	01 Oct 2020 07:55			02 Oct 2020 17:39	1
HS20100074-02	50WW13-201001	01 Oct 2020 09:05			02 Oct 2020 20:58	20
HS20100074-02	50WW13-201001	01 Oct 2020 09:05			02 Oct 2020 17:57	1
HS20100074-03	50WW11-201001	01 Oct 2020 09:55			02 Oct 2020 21:16	20
HS20100074-03	50WW11-201001	01 Oct 2020 09:55			02 Oct 2020 18:15	1
HS20100074-04	50WW11-201001-FD	01 Oct 2020 09:55			02 Oct 2020 21:34	20
HS20100074-04	50WW11-201001-FD	01 Oct 2020 09:55			02 Oct 2020 19:09	1
HS20100074-05	50WW06-201001	01 Oct 2020 10:50			02 Oct 2020 19:28	1
HS20100074-06	50WW12-201001	01 Oct 2020 11:40			02 Oct 2020 21:52	100
HS20100074-06	50WW12-201001	01 Oct 2020 11:40			02 Oct 2020 19:46	2
Batch ID: R369947 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20100074-01	50WW14-201001	01 Oct 2020 07:55			06 Oct 2020 15:49	1
HS20100074-02	50WW13-201001	01 Oct 2020 09:05			06 Oct 2020 23:02	50
HS20100074-02	50WW13-201001	01 Oct 2020 09:05			06 Oct 2020 22:38	5
HS20100074-03	50WW11-201001	01 Oct 2020 09:55			06 Oct 2020 17:49	50
HS20100074-03	50WW11-201001	01 Oct 2020 09:55			06 Oct 2020 16:13	1
HS20100074-04	50WW11-201001-FD	01 Oct 2020 09:55			06 Oct 2020 18:13	50
HS20100074-04	50WW11-201001-FD	01 Oct 2020 09:55			06 Oct 2020 16:37	1
HS20100074-05	50WW06-201001	01 Oct 2020 10:50			06 Oct 2020 21:50	1
HS20100074-06	50WW12-201001	01 Oct 2020 11:40			06 Oct 2020 22:14	1
Batch ID: R370035 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20100074-06	50WW12-201001	01 Oct 2020 11:40			07 Oct 2020 19:36	10
Batch ID: R370096 (0)	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Groundwater	
HS20100074-01	50WW14-201001	01 Oct 2020 07:55			08 Oct 2020 17:46	1
HS20100074-02	50WW13-201001	01 Oct 2020 09:05			08 Oct 2020 17:46	1
HS20100074-03	50WW11-201001	01 Oct 2020 09:55			08 Oct 2020 17:46	1
HS20100074-04	50WW11-201001-FD	01 Oct 2020 09:55			08 Oct 2020 17:46	1
HS20100074-05	50WW06-201001	01 Oct 2020 10:50			08 Oct 2020 17:46	1
HS20100074-06	50WW12-201001	01 Oct 2020 11:40			08 Oct 2020 17:46	1
Batch ID: R370673 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS20100074-01	50WW14-201001	01 Oct 2020 07:55			16 Oct 2020 14:14	1
HS20100074-02	50WW13-201001	01 Oct 2020 09:05			16 Oct 2020 14:14	1
HS20100074-03	50WW11-201001	01 Oct 2020 09:55			16 Oct 2020 14:14	1
HS20100074-04	50WW11-201001-FD	01 Oct 2020 09:55			16 Oct 2020 14:14	1
HS20100074-05	50WW06-201001	01 Oct 2020 10:50			16 Oct 2020 14:14	1
HS20100074-06	50WW12-201001	01 Oct 2020 11:40			16 Oct 2020 14:14	1

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: HS20100074

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R370713 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS20100074-01	50WW14-201001	01 Oct 2020 07:55			16 Oct 2020 18:49	1
HS20100074-02	50WW13-201001	01 Oct 2020 09:05			16 Oct 2020 18:49	1
HS20100074-03	50WW11-201001	01 Oct 2020 09:55			16 Oct 2020 18:49	1
HS20100074-04	50WW11-201001-FD	01 Oct 2020 09:55			16 Oct 2020 18:49	1
HS20100074-05	50WW06-201001	01 Oct 2020 10:50			16 Oct 2020 18:49	1
HS20100074-06	50WW12-201001	01 Oct 2020 11:40			16 Oct 2020 18:49	1

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: HS20100074

QC BATCH REPORT

Batch ID: R369947 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-200106** Units: **UG/L** Analysis Date: **06-Oct-2020 13:49**
Client ID: Run ID: **VOA6_369947** SeqNo: **5768399** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
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
Tetrachloroethene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*45.31*	*1.0*	*50*	*0*	*90.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.5*	*1.0*	*50*	*0*	*107*	*85 - 114*				
Surr: Dibromofluoromethane	*46.64*	*1.0*	*50*	*0*	*93.3*	*80 - 119*				
Surr: Toluene-d8	*50.28*	*1.0*	*50*	*0*	*101*	*89 - 112*				

LCS Sample ID: **VLCSW-200106** Units: **UG/L** Analysis Date: **06-Oct-2020 13:01**
Client ID: Run ID: **VOA6_369947** SeqNo: **5768398** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	19.01	1.0	20	0	95.1	71 - 131				
1,2-Dichloroethane	19.01	1.0	20	0	95.1	73 - 128				
cis-1,2-Dichloroethene	19.21	1.0	20	0	96.1	78 - 123				
Tetrachloroethene	18.39	1.0	20	0	92.0	74 - 129				
Trichloroethene	18.66	1.0	20	0	93.3	79 - 123				
Vinyl chloride	18.61	1.0	20	0	93.0	58 - 137				
Surr: 1,2-Dichloroethane-d4	*47.78*	*1.0*	*50*	*0*	*95.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.27*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*48.22*	*1.0*	*50*	*0*	*96.4*	*80 - 119*				
Surr: Toluene-d8	*47.82*	*1.0*	*50*	*0*	*95.6*	*89 - 112*				

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: HS20100074

QC BATCH REPORT

Batch ID: R369947 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20100074-01MS** Units: **UG/L** Analysis Date: **06-Oct-2020 17:01**
Client ID: **50WW14-201001** Run ID: **VOA6_369947** SeqNo: **5768407** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	25.89	1.0	20	0	129	71 - 131				
1,2-Dichloroethane	23.12	1.0	20	0	116	73 - 128				
cis-1,2-Dichloroethene	27.05	1.0	20	2.931	121	78 - 123				
Tetrachloroethene	24.03	1.0	20	0	120	74 - 129				
Trichloroethene	104.5	1.0	20	73.92	153	79 - 123				S
Vinyl chloride	24.72	1.0	20	0	124	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.97*	*1.0*	*50*	*0*	*91.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.03*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*47.64*	*1.0*	*50*	*0*	*95.3*	*80 - 119*				
Surr: Toluene-d8	*48.79*	*1.0*	*50*	*0*	*97.6*	*89 - 112*				

MSD Sample ID: **HS20100074-01MSD** Units: **UG/L** Analysis Date: **06-Oct-2020 17:25**
Client ID: **50WW14-201001** Run ID: **VOA6_369947** SeqNo: **5768408** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	25.17	1.0	20	0	126	71 - 131	25.89	2.84	20	
1,2-Dichloroethane	23.28	1.0	20	0	116	73 - 128	23.12	0.717	20	
cis-1,2-Dichloroethene	26.48	1.0	20	2.931	118	78 - 123	27.05	2.13	20	
Tetrachloroethene	23.65	1.0	20	0	118	74 - 129	24.03	1.59	20	
Trichloroethene	99.73	1.0	20	73.92	129	79 - 123	104.5	4.68	20	S
Vinyl chloride	23.67	1.0	20	0	118	58 - 137	24.72	4.33	20	
Surr: 1,2-Dichloroethane-d4	*45.61*	*1.0*	*50*	*0*	*91.2*	*81 - 118*	*45.97*	*0.788*	*20*	
Surr: 4-Bromofluorobenzene	*51.76*	*1.0*	*50*	*0*	*104*	*85 - 114*	*52.03*	*0.521*	*20*	
Surr: Dibromofluoromethane	*47.21*	*1.0*	*50*	*0*	*94.4*	*80 - 119*	*47.64*	*0.918*	*20*	
Surr: Toluene-d8	*48.84*	*1.0*	*50*	*0*	*97.7*	*89 - 112*	*48.79*	*0.118*	*20*	

The following samples were analyzed in this batch: HS20100074-01 HS20100074-02 HS20100074-03 HS20100074-04 HS20100074-05 HS20100074-06

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: HS20100074

QC BATCH REPORT

Batch ID: R370035 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200107** Units: **UG/L** Analysis Date: **07-Oct-2020 13:11**
Client ID: Run ID: **VOA6_370035** SeqNo: **5770429** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*45.98*	*1.0*	*50*	*0*	*92.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*54.08*	*1.0*	*50*	*0*	*108*	*85 - 114*				
Surr: Dibromofluoromethane	*47.27*	*1.0*	*50*	*0*	*94.5*	*80 - 119*				
Surr: Toluene-d8	*49.55*	*1.0*	*50*	*0*	*99.1*	*89 - 112*				

LCS Sample ID: **VLCSW-200107** Units: **UG/L** Analysis Date: **07-Oct-2020 12:23**
Client ID: Run ID: **VOA6_370035** SeqNo: **5770428** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	20.43	1.0	20	0	102	79 - 123				
Surr: 1,2-Dichloroethane-d4	*49.67*	*1.0*	*50*	*0*	*99.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.06*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*49.6*	*1.0*	*50*	*0*	*99.2*	*80 - 119*				
Surr: Toluene-d8	*49.83*	*1.0*	*50*	*0*	*99.7*	*89 - 112*				

MS Sample ID: **HS20100133-06MS** Units: **UG/L** Analysis Date: **07-Oct-2020 18:48**
Client ID: Run ID: **VOA6_370035** SeqNo: **5770443** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	23.85	1.0	20	0	119	79 - 123				
Surr: 1,2-Dichloroethane-d4	*48.18*	*1.0*	*50*	*0*	*96.4*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.59*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*48.55*	*1.0*	*50*	*0*	*97.1*	*80 - 119*				
Surr: Toluene-d8	*48.26*	*1.0*	*50*	*0*	*96.5*	*89 - 112*				

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: HS20100074

QC BATCH REPORT

Batch ID: R370035 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS20100133-06MSD** Units: **UG/L** Analysis Date: **07-Oct-2020 19:12**
Client ID: Run ID: **VOA6_370035** SeqNo: **5770444** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	23.73	1.0	20	0	119	79 - 123	23.85	0.499	20	
Surr: 1,2-Dichloroethane-d4	*46.7*	*1.0*	*50*	*0*	*93.4*	*81 - 118*	*48.18*	*3.11*	*20*	
Surr: 4-Bromofluorobenzene	*52.31*	*1.0*	*50*	*0*	*105*	*85 - 114*	*52.59*	*0.538*	*20*	
Surr: Dibromofluoromethane	*47.02*	*1.0*	*50*	*0*	*94.0*	*80 - 119*	*48.55*	*3.2*	*20*	
Surr: Toluene-d8	*48.59*	*1.0*	*50*	*0*	*97.2*	*89 - 112*	*48.26*	*0.683*	*20*	

The following samples were analyzed in this batch: HS20100074-06

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: HS20100074

QC BATCH REPORT

Batch ID: R369813 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-100220** Units: **mg/L** Analysis Date: **02-Oct-2020 10:44**
Client ID: Run ID: **ICS-Integrion_369813** SeqNo: **5765380** 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
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-100220** Units: **mg/L** Analysis Date: **02-Oct-2020 11:02**
Client ID: Run ID: **ICS-Integrion_369813** SeqNo: **5765381** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.51	0.500	20	0	97.6	80 - 120				
Nitrogen, Nitrate (As N)	3.953	0.100	4	0	98.8	80 - 120				
Sulfate	18.84	0.500	20	0	94.2	80 - 120				

MS Sample ID: **HS20100074-01MS** Units: **mg/L** Analysis Date: **02-Oct-2020 20:04**
Client ID: **50WW14-201001** Run ID: **ICS-Integrion_369813** SeqNo: **5765398** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	392.3	0.500	10	388.6	37.6	80 - 120				SEO
Nitrogen, Nitrate (As N)	2.329	0.100	2	0	116	80 - 120				
Sulfate	371.1	0.500	10	369.4	16.9	80 - 120				SEO

MS Sample ID: **HS20100055-04MS** Units: **mg/L** Analysis Date: **02-Oct-2020 17:03**
Client ID: Run ID: **ICS-Integrion_369813** SeqNo: **5765388** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	144.2	0.500	10	137.2	70.3	80 - 120				SEO
Nitrogen, Nitrate (As N)	7.175	0.100	2	5.31	93.3	80 - 120				
Sulfate	80.39	0.500	10	72.59	78.0	80 - 120				SO

ALS Houston, US Date: 16-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: HS20100074

QC BATCH REPORT

Batch ID: R369813 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MSD Sample ID: **HS20100074-01MSD** Units: **mg/L** Analysis Date: **02-Oct-2020 20:22**
Client ID: **50WW14-201001** Run ID: **ICS-Integrion_369813** SeqNo: **5765399** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	392.2	0.500	10	388.6	35.7	80 - 120	392.3	0.0477	20	SEO
Nitrogen, Nitrate (As N)	2.185	0.100	2	0	109	80 - 120	2.329	6.39	20	
Sulfate	372	0.500	10	369.4	26.0	80 - 120	371.1	0.246	20	SEO

MSD Sample ID: **HS20100055-04MSD** Units: **mg/L** Analysis Date: **02-Oct-2020 17:21**
Client ID: Run ID: **ICS-Integrion_369813** SeqNo: **5765389** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	144.5	0.500	10	137.2	73.0	80 - 120	144.2	0.186	20	SEO
Nitrogen, Nitrate (As N)	7.107	0.100	2	5.31	89.9	80 - 120	7.175	0.952	20	
Sulfate	81.02	0.500	10	72.59	84.4	80 - 120	80.39	0.787	20	O

The following samples were analyzed in this batch: HS20100074-01 HS20100074-02 HS20100074-03 HS20100074-04 HS20100074-05 HS20100074-06

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2020
WorkOrder: **HS20100074**

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	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	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	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2020-2021	30-Apr-2021
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US Date: 16-Oct-20

Sample Receipt Checklist

Work Order ID: HS20100074 **Date/Time Received:** 02-Oct-2020 09:40

Client Name: CBI-Houston **Received by:** Jared R. Makan

Completed By:	/S/ Jared R. Makan	02-Oct-2020 15:01	**Reviewed by:**	/S/ RJ Modashia	02-Oct-2020 17:04
	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):	1.3°C/1.3°C UC/C	IR31	
Cooler(s)/Kit(s):	Blue		
Date/Time sample(s) sent to storage:	10/02/2020 15:00		
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: **LHAAP50 October 2020**

Prepared By: Scott Beesinger

P.O. Number

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 (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW6850	Remarks (Preservatives, etc.)	Lab I.D.#
50WW14-201001	WG	10/1/20/0755		13	X	X	X	X	X	X		
50WW14-201001-MS	WG	10/1/20/0755		13	X	X	X	X	X	X		
50WW14-201001-MSD	WG	10/1/20/0755		13	X	X	X	X	X	X		
50WW13-201001	WG	10/1/20/0905		13	X	X	X	X	X	X		
50WW11-201001	WG	10/1/20/0955		13	X	X	X	X	X	X		
50WW11-201001-FD	WG	10/1/20/0955		13	X	X	X	X	X	X		
50WW06-201001	WG	10/1/20/1050		13	X	X	X	X	X	X		
50WW12-201001	WG	10/1/20/1140		13	X	X	X	X	X	X		

Additional Remarks: **Standard TAT on all parameters. Please email results to Susan.Huang@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	10/1/20	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Imaeme	10/2/20	0914							

Remarks:
Cooler - Blue 1431
Temp 1.3°C CFO

HS20100074

Aptim Environmental & Infrastucture, Inc.
LHAAP50 October 2020

(Word) S:\E-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

BME

CUSTODY SEAL

Date: 10/1/20 Time: 1430
Name: Scott Beesinger
Company: BHMTA

Seal Broken By: JM
Date: 10/02/20

BME OCT 0 2 2020

October 16, 2020 Service Request No:E2000944

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: HS20100074

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 05, 2020
For your reference, these analyses have been assigned our service request number **E2000944.**

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

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.:**	E2000944
Project:	HS20100074	**Date Received:**	10/05/20
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 IV. 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 10/05/20.

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:

EQ2000497: 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, LCSD, 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:**E2000944
Project: HS20100074

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2000944-001	50WW14-201001	10/1/2020	0750
E2000944-002	50WW13-201001	10/1/2020	0835
E2000944-003	50WW11-201001	10/1/2020	0920
E2000944-004	50WW11-201001-FD	10/1/2020	0920
E2000944-005	50WW06-201001	10/1/2020	1000
E2000944-006	50WW12-201001	10/1/2020	1045

Service Request Summary

Folder #: **E2000944**
Client Name: ALS Environmental - US
Project Name: HS20100074
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: 10/05/20
Internal Due Date: 10/16/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20080476
EDD: No EDD Specified

8 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 8D
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2000944-001	50WW14-201001	Ground Water	10/01/20 0750	**IV**
E2000944-002	50WW13-201001	Ground Water	10/01/20 0835	**IV**
E2000944-003	50WW11-201001	Ground Water	10/01/20 0920	**IV**
E2000944-004	50WW11-201001-FD	Ground Water	10/01/20 0920	**IV**
E2000944-005	50WW06-201001	Ground Water	10/01/20 1000	**IV**
E2000944-006	50WW12-201001	Ground Water	10/01/20 1045	**IV**

Service Request Summary

Folder #: **E2000944**
Client Name: ALS Environmental - US
Project Name: HS20100074
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: 10/05/20
Internal Due Date: 10/16/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20080476
EDD: No EDD Specified

8 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 8D
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	5	Level II due 10/16,level IV 10/23
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.
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.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

Data Qualifiers

Lab 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	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
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	LA028-2020	12/31/2020
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Minnesota Department of Health	1785988	12/31/2020
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
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	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022
Washington Department of Health	C819	11/14/2020

ALS

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

E2000944 5
ALS Laboratory Group
HS20080476

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **14818**

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:	HS20100074
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20100074-01**	**50WW14-201001**	**Groundwater**	**01 Oct 2020 07:55**
	SUB_Perch-6850			09 Oct 2020
2.	**HS20100074-02**	**50WW13-201001**	**Groundwater**	**01 Oct 2020 09:05**
	SUB_Perch-6850			09 Oct 2020
3.	**HS20100074-03**	**50WW11-201001**	**Groundwater**	**01 Oct 2020 09:55**
	SUB_Perch-6850			09 Oct 2020
4.	**HS20100074-04**	**50WW11-201001-FD**	**Groundwater**	**01 Oct 2020 09:55**
	SUB_Perch-6850			09 Oct 2020
5.	**HS20100074-05**	**50WW06-201001**	**Groundwater**	**01 Oct 2020 10:50**
	SUB_Perch-6850			09 Oct 2020
6.	**HS20100074-06**	**50WW12-201001**	**Groundwater**	**01 Oct 2020 11:40**
	SUB_Perch-6850			09 Oct 2020

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

HS20100074-01 MS/MSD

QC Level: DOD IV (DoD Data Package)

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **14818**

Relinquished By: _____ Date/Time: _____

Received By: CORETS Date/Time: 10/5/20 1200

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

Cooler Receipt Form

Project Chemist ch

Client/Project ALS-HI

Thermometer ID 1251

Date/Time Received: 10/15/12 0 Initials: ch

Date/Time Logged in: 10/15/12 0 Initials ch

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?
-		10/15/12	1100	ch	1.9	☒
						☐
						☐
						☐

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: E2000944 5

ALS Laboratory Group
HS20080476

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#: 367345 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/KBROWN **Prep Method:** Method **Prep Date/Time:** 10/9/20 11:34

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2000943-001	50WW29-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2000943-002	50WW05-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2000944-001	50WW14-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2000944-002	50WW13-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2000944-003	50WW11-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2000944-004	50WW11-201001-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2000944-005	50WW06-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2000944-006	50WW12-201001	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2000949-001	LH18/24-SP650_100620-AIX	.01	6850/ClO4 DOD			Water	10mL	
10	E2000949-002	LH18/24-SP650_100620-BIX	.01	6850/ClO4 DOD			Water	10mL	
11	E2000964-001	50WW09-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2000964-002	50WW08-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2000964-003	50WW22-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2000964-004	50WW23-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2000964-005	50WW15-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2000964-006	50WW16-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
17	E2000964-007	50WW18-201005	.01	6850/ClO4 DOD			Ground Water	10mL	
18	E2000964-008	50WW1-201005-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
19	EQ2000497-01	MB		6850/ClO4 DOD			Liquid	10mL	
20	EQ2000497-02	LCS		6850/ClO4 DOD			Liquid	10mL	
21	EQ2000497-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
22	EQ2000497-04	50WW14-201001 MS	.02	6850/ClO4 DOD			Liquid	10mL	
23	EQ2000497-05	50WW14-201001 DMS	.03	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 209764 Logbook Ref: Perchlorate Int. Stock1 51820 Expires On: 11/18/2020

EQ2000497-02	1.00µL	EQ2000497-03	1.00µL	EQ2000497-04	1.00µL	EQ2000497-05	1.00µL

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 212340 Logbook Ref: Sodium Perchlorate Expires On: 07/13/2022

E2000943-001	100.00µL	E2000943-002	100.00µL	E2000944-001	100.00µL	E2000944-002	100.00µL	E2000944-003	100.00µL	E2000944-004	100.00µL
E2000944-005	100.00µL	E2000944-006	100.00µL	E2000949-001	100.00µL	E2000949-002	100.00µL	E2000964-001	100.00µL	E2000964-002	100.00µL
E2000964-003	100.00µL	E2000964-004	100.00µL	E2000964-005	100.00µL	E2000964-006	100.00µL	E2000964-007	100.00µL	E2000964-008	100.00µL
EQ2000497-01	100.00µL	EQ2000497-02	100.00µL	EQ2000497-03	100.00µL	EQ2000497-04	100.00µL	EQ2000497-05	100.00µL		

Preparation Information Benchsheet

Prep Run#: 367345 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/KBROWN **Prep Method:** Method **Prep Date/Time:** 10/9/20 11:34

Preparation Steps

Step: Preparation
Started: 10/9/20 11:34
Finished: 10/9/20 13:30
By: KBROWN
Comments

Comments: _____

Reviewed By: GR Date: 10/10/2020

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:**	E2000944
Project:	HS20100074	**Date Collected:**	10/ 1/20 0750
Sample Matrix:	Ground Water	**Date Received:**	10/ 5/20
Sample Name:	50WW14-201001	**Units:**	µg/L
Lab Code:	E2000944-001	**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	**1.37**		1.00	0.500	0.250	10	10/ 9/20	10/16/20 11:14	367345	699559	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20100074	**Date Collected:**	10/ 1/20 0835
Sample Matrix:	Ground Water	**Date Received:**	10/ 5/20
Sample Name:	50WW13-201001	**Units:**	µg/L
Lab Code:	E2000944-002	**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	**4390**		20.0	10.0	5.00	200	10/ 9/20	10/16/20 11:22	367345	699559	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20100074	**Date Collected:**	10/ 1/20 0920
Sample Matrix:	Ground Water	**Date Received:**	10/ 5/20
Sample Name:	50WW11-201001	**Units:**	µg/L
Lab Code:	E2000944-003	**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	**6630**		20.0	10.0	5.00	200	10/ 9/20	10/16/20 11:30	367345	699559	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20100074	**Date Collected:**	10/ 1/20 0920
Sample Matrix:	Ground Water	**Date Received:**	10/ 5/20
Sample Name:	50WW11-201001-FD	**Units:**	µg/L
Lab Code:	E2000944-004	**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	**7940**		20.0	10.0	5.00	200	10/ 9/20	10/16/20 11:38	367345	699559	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20100074	**Date Collected:**	10/ 1/20 1000
Sample Matrix:	Ground Water	**Date Received:**	10/ 5/20
Sample Name:	50WW06-201001	**Units:**	µg/L
Lab Code:	E2000944-005	**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	**1660**		10.0	5.00	2.50	100	10/ 9/20	10/16/20 11:46	367345	699559	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20100074	**Date Collected:**	10/ 1/20 1045
Sample Matrix:	Ground Water	**Date Received:**	10/ 5/20
Sample Name:	50WW12-201001	**Units:**	µg/L
Lab Code:	E2000944-006	**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	**41600**		100	50.0	25.0	1000	10/ 9/20	10/16/20 11:54	367345	699559	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20100074	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2000497-01	**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	10/ 9/20	10/9/20 15:24	367345	698929	

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: HS20100074
Sample Matrix: Ground Water

Service Request: E2000944
Date Analyzed: 10/ 9/20

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: 367345

	Lab Control Sample EQ2000497-02			Duplicate Lab Control Sample EQ2000497-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0996	0.100	100	0.111	0.100	111	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:**	E2000944
Project:	HS20100074	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000497-02	**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	**0.0996**	J	0.100	0.0500	0.0250	1	10/ 9/20	10/9/20 15:32	367345	698929	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20100074	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000497-03	**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	**0.111**		0.100	0.0500	0.0250	1	10/ 9/20	10/9/20 15:40	367345	698929	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20100074	**Date Collected:**	10/1/20
Sample Matrix:	Ground Water	**Date Received:**	10/5/20
		Date Analyzed:	10/16/20

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	50WW14-201001	**Units:**	µg/L
Lab Code:	E2000944-001	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		50WW14-201001MS				50WW14-201001DMS					
		Matrix Spike				**Duplicate Matrix Spike**					
		EQ2000497-04				EQ2000497-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	1.37	1.46	0.100	94	1.47	0.100	101	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:**	E2000944
Project:	HS20100074	**Date Collected:**	10/ 1/20 0750
Sample Matrix:	Ground Water	**Date Received:**	10/ 5/20
Sample Name:	50WW14-201001	**Units:**	µg/L
Lab Code:	EQ2000497-04	**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	**1.46**		1.00	0.500	0.250	10	10/ 9/20	10/16/20 12:25	367345	699559	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20100074	**Date Collected:**	10/ 1/20 0750
Sample Matrix:	Ground Water	**Date Received:**	10/ 5/20
Sample Name:	50WW14-201001	**Units:**	µg/L
Lab Code:	EQ2000497-05	**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	**1.47**		1.00	0.500	0.250	10	10/ 9/20	10/16/20 12:09	367345	699559	

Initial Calibration

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20200915

1st Review: Grivera
2nd Review: Hvan

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 9/15/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000032**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	PERCHLORATE1		20200915_044	Perchlorate6850b.lcm	1x	☒	3100806-05	9/15/2020 17:55
2	PERCHLORATE2		20200915_024	Perchlorate6850b.lcm	1x	☒	3100806-06	9/15/2020 15:10
3	PERCHLORATE3		20200915_046	Perchlorate6850b.lcm	1x	☒	3100806-07	9/15/2020 18:13
4	PERCHLORATE4		20200915_047	Perchlorate6850b.lcm	1x	☒	3100807-01	9/15/2020 18:21
5	PERCHLORATE5		20200915_048	Perchlorate6850b.lcm	1x	☒	3100807-02	9/15/2020 18:29
6	PERCHLORATE6		20200915_049	Perchlorate6850b.lcm	1x	☒	3100807-03	9/15/2020 18:37
7	PERCHLORATE7		20200915_029	Perchlorate6850b.lcm	1x	☒	3100807-04	9/15/2020 15:49
8	PERCHLORATE8		20200915_051	Perchlorate6850b.lcm	1x	☒	3100807-05	9/15/2020 18:52
9	PERCHLORATE9		20200915_052	Perchlorate6850b.lcm	1x	☒	3100807-06	9/15/2020 19:00
10	PERCHLORATE10		20200915_053	Perchlorate6850b.lcm	1x	☒	3100807-07	9/15/2020 19:08
11	PERCHLORATE ICV		20200915_054	Perchlorate6850b.lcm	1x	☒	3100807-08	9/15/2020 19:16
12	LODV		20200915_055	Perchlorate6850b.lcm	1x	☒		9/15/2020 19:24
13	E2000817-001		20200915_056	Perchlorate6850b.lcm	1x	☒		9/15/2020 19:40
14	E2000817-001x10		20200915_057	Perchlorate6850b.lcm	1x	☒		9/15/2020 19:48
15	PERCHLORATE7		20200915_058	Perchlorate6850b.lcm	1x	☒	3100807-04	9/15/2020 19:56
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								

Initial Calibration - Detailed Report

Calibration ID: EC2000032 **Instrument ID:** E-LCMS-01
Column Name: 1

#	Lab Code	Sample Name	File Location	Aquisition Date
01	EC2000032-01	PERCHLORATE2	20200915_024	09/15/2020 15:10
02	EC2000032-02	PERCHLORATE7	20200915_029	09/15/2020 15:49
03	EC2000032-03	PERCHLORATE1	20200915_044	09/15/2020 17:55
04	EC2000032-04	PERCHLORATE3	20200915_046	09/15/2020 18:13
05	EC2000032-05	PERCHLORATE4	20200915_047	09/15/2020 18:21
06	EC2000032-06	PERCHLORATE5	20200915_048	09/15/2020 18:29
07	EC2000032-07	PERCHLORATE6	20200915_049	09/15/2020 18:37
08	EC2000032-08	PERCHLORATE8	20200915_051	09/15/2020 18:52
09	EC2000032-09	PERCHLORATE9	20200915_052	09/15/2020 19:00
10	EC2000032-10	PERCHLORATE10	20200915_053	09/15/2020 19:08

Analyte **Curve Fit** **Weighting**

Perchlorate **Quadratic** **Equal** **COD = 0.9998** **Y= -9.474E-05 X² + 0.1066 X + 0.00148**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5000	0.1319	02	10.0000	0.1001	03	0.1000	0.1399	04	0.7000	0.1079
05	1.0000	0.1089	06	2.0000	0.1096	07	5.0000	0.1086	08	20.0000	0.1062
09	30.0000	0.104	10	50.0000	0.1018						

Analyte

Perchlorate

#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D
01	0.5000	0.605	21.0	02	10.0000	9.45	-5.5	03	0.1000	0.117	17.3
04	0.7000	0.695	-0.8	05	1.0000	1.01	0.8	06	2.0000	2.05	2.3
07	5.0000	5.10	2.0	08	20.0000	20.3	1.3	09	30.0000	30.1	0.2
10	50.0000	50.0	-0.1								

Initial Calibration Verification Summary Report

Calibration ID:	EC2000032	**Instrument ID:**	E-LCMS-01
Datafile ID:	20200915_054	**Column Name:**	1

Analyte	Lab Code	Type	Curve Fit	True Value	Calc Conc	Units	Result	Criteria
Perchlorate	EC2000032-11	T	Quadratic	10	9.462	ng/mL	-5.4	<= 15

ALS Group Houston

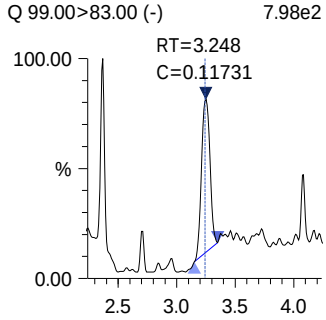
PERCHLORATE1

Date acquired: 9/15/2020 5:55:29 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_044.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE1	9/15/2020 5:55:29 PM	2833	0.11731	20200915_044	3.248	25.0000	1.0000	5
Sodium Perchlorate-18O4_IS	PERCHLORATE1	9/15/2020 5:55:29 PM	202512	1.00000	20200915_044	3.237	25.0000	1.0000	5

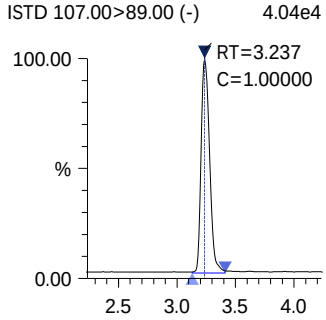
Perchlorate

Conc 0.11731
Area 2833



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 202512



ALS Group Houston

PERCHLORATE2

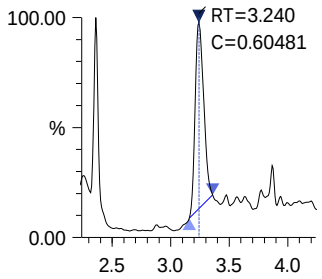
Date acquired: 9/15/2020 3:10:04 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_024.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE2	9/15/2020 3:10:04 PM	11634	0.60481	20200915_024	3.240	25.0000	1.0000	6
Sodium Perchlorate-18O4_IS	PERCHLORATE2	9/15/2020 3:10:04 PM	176422	1.00000	20200915_024	3.240	25.0000	1.0000	6

Perchlorate

Conc 0.60481
Area 11634

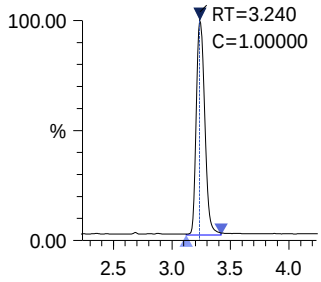
Q 99.00>83.00 (-) 2.66e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 176422

ISTD 107.00>89.00 (-) 3.50e4



ALS Group Houston

PERCHLORATE3

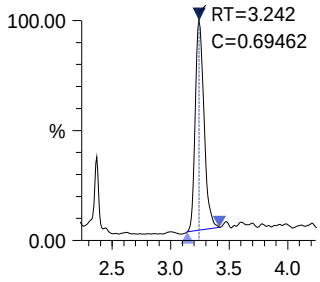
Date acquired: 9/15/2020 6:13:20 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_046.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE3	9/15/2020 6:13:20 PM	14722	0.69462	20200915_046	3.242	25.0000	1.0000	7
Sodium Perchlorate-18O4_IS	PERCHLORATE3	9/15/2020 6:13:20 PM	194971	1.00000	20200915_046	3.239	25.0000	1.0000	7

Perchlorate

Conc 0.69462
Area 14722

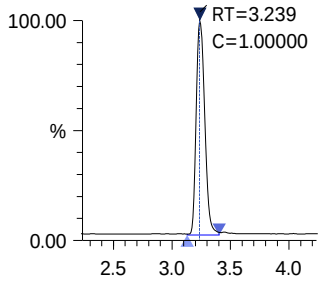
Q 99.00>83.00 (-) 2.91e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 194971

ISTD 107.00>89.00 (-) 3.85e4



ALS Group Houston

PERCHLORATE4

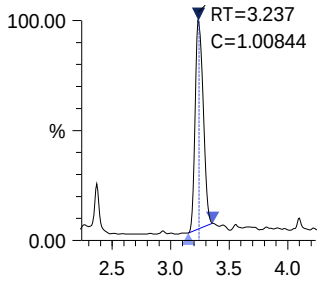
Date acquired: 9/15/2020 6:21:15 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_047.lcd
Vial: 8 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE4	9/15/2020 6:21:15 PM	19524	1.00844	20200915_047	3.237	25.0000	1.0000	8
Sodium Perchlorate-18O4_IS	PERCHLORATE4	9/15/2020 6:21:15 PM	179246	1.00000	20200915_047	3.240	25.0000	1.0000	8

Perchlorate

Conc 1.00844
Area 19524

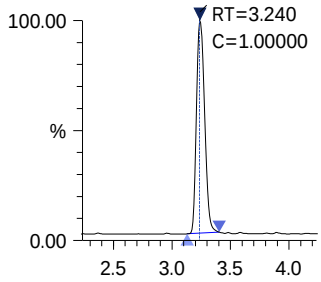
Q 99.00>83.00 (-) 4.23e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 179246

ISTD 107.00>89.00 (-) 3.75e4



ALS Group Houston

PERCHLORATE5

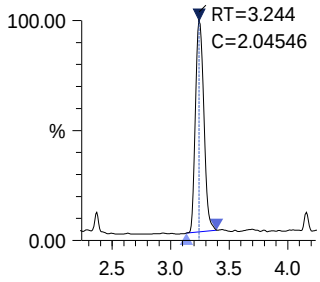
Date acquired: 9/15/2020 6:29:08 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_048.lcd
Vial: 9 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE5	9/15/2020 6:29:08 PM	38522	2.04546	20200915_048	3.244	25.0000	1.0000	9
Sodium Perchlorate-18O4_IS	PERCHLORATE5	9/15/2020 6:29:08 PM	175734	1.00000	20200915_048	3.240	25.0000	1.0000	9

Perchlorate

Conc 2.04546
Area 38522

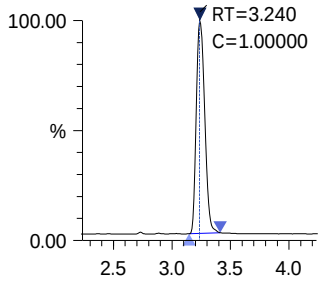
Q 99.00>83.00 (-) 7.92e3



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 175734

ISTD 107.00>89.00 (-) 3.56e4



ALS Group Houston

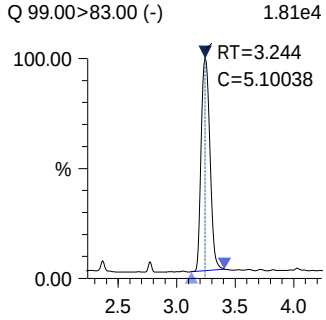
PERCHLORATE6

Date acquired: 9/15/2020 6:37:05 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_049.lcd
Vial: 10 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE6	9/15/2020 6:37:05 PM	92162	5.10038	20200915_049	3.244	25.0000	1.0000	10
Sodium Perchlorate-18O4_IS	PERCHLORATE6	9/15/2020 6:37:05 PM	169754	1.00000	20200915_049	3.239	25.0000	1.0000	10

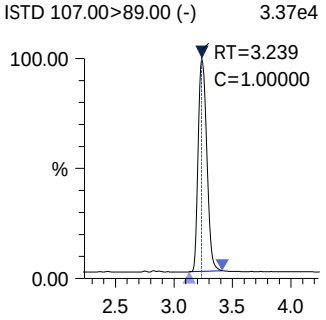
Perchlorate

Conc 5.10038
Area 92162



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 169754



ALS Group Houston

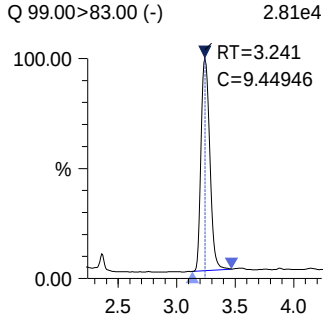
PERCHLORATE7

Date acquired: 9/15/2020 3:49:35 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_029.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	9/15/2020 3:49:35 PM	144012	9.44946	20200915_029	3.241	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	9/15/2020 3:49:35 PM	143911	1.00000	20200915_029	3.238	25.0000	1.0000	4

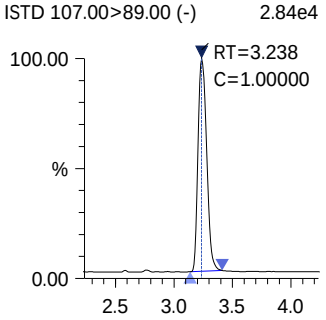
Perchlorate

Conc 9.44946
Area 144012



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 143911



ALS Group Houston

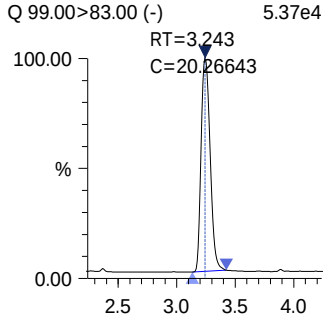
PERCHLORATE8

Date acquired: 9/15/2020 6:52:54 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_051.lcd
Vial: 11 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE8	9/15/2020 6:52:54 PM	284308	20.26643	20200915_051	3.243	25.0000	1.0000	11
Sodium Perchlorate-18O4_IS	PERCHLORATE8	9/15/2020 6:52:54 PM	133870	1.00000	20200915_051	3.240	25.0000	1.0000	11

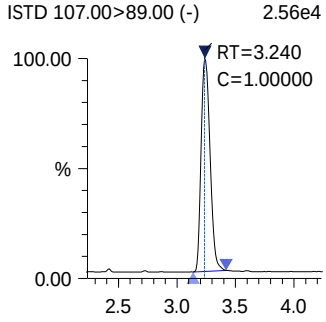
Perchlorate

Conc 20.26643
Area 284308



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 133870



ALS Group Houston

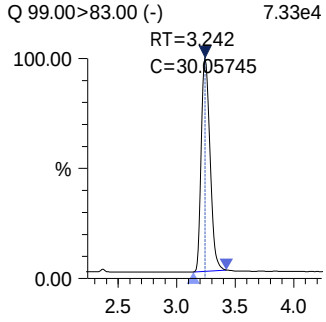
PERCHLORATE9

Date acquired: 9/15/2020 7:00:50 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_052.lcd
Vial: 12 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE9	9/15/2020 7:00:50 PM	377183	30.05745	20200915_052	3.242	25.0000	1.0000	12
Sodium Perchlorate-18O4_IS	PERCHLORATE9	9/15/2020 7:00:50 PM	120846	1.00000	20200915_052	3.240	25.0000	1.0000	12

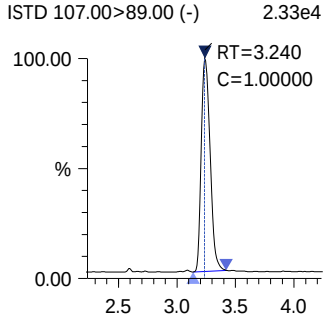
Perchlorate

Conc 30.05745
Area 377183



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 120846



ALS Group Houston

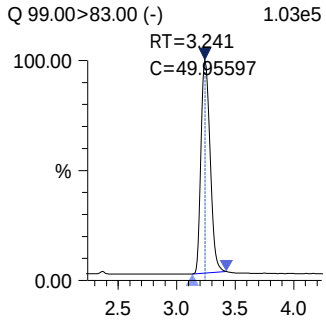
PERCHLORATE10

Date acquired: 9/15/2020 7:08:43 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_053.lcd
Vial: 13 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE10	9/15/2020 7:08:43 PM	553330	49.95597	20200915_053	3.241	25.0000	1.0000	13
Sodium Perchlorate-18O4_IS	PERCHLORATE10	9/15/2020 7:08:43 PM	108660	1.00000	20200915_053	3.240	25.0000	1.0000	13

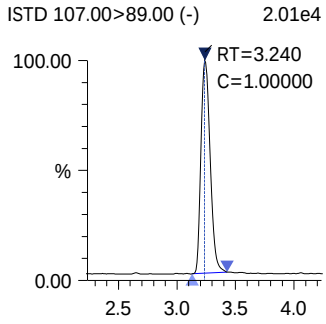
Perchlorate

Conc 49.95597
Area 553330



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 108660



ALS Group Houston

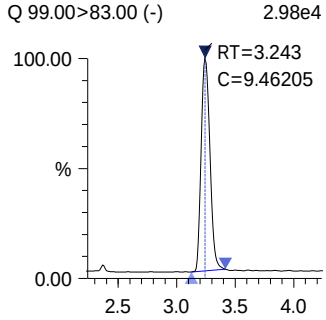
PERCHLORATEICV

Date acquired: 9/15/2020 7:16:39 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200915\20200915_054.lcd
Vial: 14 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATEICV	9/15/2020 7:16:39 PM	152650	9.46205	20200915_054	3.243	25.0000	1.0000	14
Sodium Perchlorate-18O4_IS	PERCHLORATEICV	9/15/2020 7:16:39 PM	152342	1.00000	20200915_054	3.241	25.0000	1.0000	14

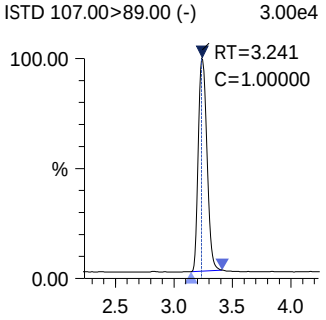
Perchlorate

Conc 9.46205
Area 152650



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 152342



Chromatograms and Selected Ion Monitoring

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 320, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20201009

ALS Environmental

ICAL Date: 9/15/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000032**

1st Review: Grivera
2nd Review: Kneir

Injection Log
LCMS01 -Shimadzu 8050

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	null		20201009_001	Perchlorate6850b.lcm	1x	☒		10/9/2020 13:57
2	null		20201009_002	Perchlorate6850b.lcm	1x	☒		10/9/2020 14:02
3	IB		20201009_003	Perchlorate6850b.lcm	1x	☒		10/9/2020 14:52
4	LODV		20201009_004	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:00
5	PERCHLORATE7		20201009_005	Perchlorate6850b.lcm	1x	☒	3100807-04	10/9/2020 15:08
6	ICS		20201009_006	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:16
7	EQ2000497-01		20201009_007	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:24
8	EQ2000497-02		20201009_008	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:32
9	EQ2000497-03		20201009_009	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:40
10	EQ2000497-04		20201009_010	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:48
11	EQ2000497-05		20201009_011	Perchlorate6850b.lcm	1x	☒		10/9/2020 15:55
12	E2000943-001		20201009_012	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:03
13	E2000943-002		20201009_013	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:11
14	E2000944-001		20201009_014	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:19
15	E2000944-002		20201009_015	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:27
16	E2000944-003		20201009_016	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:35
17	PERCHLORATE7		20201009_017	Perchlorate6850b.lcm	1x	☒	3100807-04	10/9/2020 16:43
18	E2000944-004		20201009_018	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:51
19	E2000944-005		20201009_019	Perchlorate6850b.lcm	1x	☒		10/9/2020 16:58
20	E2000944-006		20201009_020	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:06
21	E2000949-001		20201009_021	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:14
22	E2000949-002		20201009_022	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:22
23	E2000964-001		20201009_023	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:30
24	E2000964-002		20201009_024	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:38
25	E2000964-003		20201009_025	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:46
26	E2000964-004		20201009_026	Perchlorate6850b.lcm	1x	☒		10/9/2020 17:54
27	E2000964-005		20201009_027	Perchlorate6850b.lcm	1x	☒		10/9/2020 18:02
28	PERCHLORATE7		20201009_028	Perchlorate6850b.lcm	1x	☒	3100807-04	10/9/2020 18:10
29	E2000964-006		20201009_029	Perchlorate6850b.lcm	1x	☒		10/9/2020 18:17
30	E2000964-007		20201009_030	Perchlorate6850b.lcm	1x	☒		10/9/2020 18:25
31	E2000964-008		20201009_031	Perchlorate6850b.lcm	1x	☒		10/9/2020 18:33
32	PERCHLORATE7		20201009_032	Perchlorate6850b.lcm	1x	☒	3100807-04	10/9/2020 18:41
33								
34								
35								
36								
37								
38								
39								

20201016

ALS Environmental

ICAL Date: 9/15/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000032**

1st Review: Grivera
2nd Review: Kneir

Injection Log
LCMS01 -Shimadzu 8050

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	null		20201016_001	Perchlorate6850b.lcm	1x	☒		10/16/2020 8:39
2	null		20201016_002	Perchlorate6850b.lcm	1x	☒		10/16/2020 8:44
3	IB		20201016_003	Perchlorate6850b.lcm	1x	☒		10/16/2020 8:49
4	IB		20201016_004	Perchlorate6850b.lcm	1x	☒		10/16/2020 8:57
5	LODV		20201016_005	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:05
6	ICS		20201016_006	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:13
7	PERCHLORATE7		20201016_007	Perchlorate6850b.lcm	1x	☒	3100807-04	10/16/2020 9:21
8	E2000943-001		20201016_008	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:33
9	E2000943-002		20201016_009	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:41
10	E2000944-001		20201016_010	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:49
11	E2000944-002		20201016_011	Perchlorate6850b.lcm	1x	☒		10/16/2020 9:57
12	E2000944-003		20201016_012	Perchlorate6850b.lcm	1x	☒		10/16/2020 10:04
13	E2000944-004		20201016_013	Perchlorate6850b.lcm	1x	☒		10/16/2020 10:12
14	E2000944-005		20201016_014	Perchlorate6850b.lcm	1x	☒		10/16/2020 10:20
15	E2000944-006		20201016_015	Perchlorate6850b.lcm	1x	☒		10/16/2020 10:28
16	PERCHLORATE7		20201016_018	Perchlorate6850b.lcm	1x	☒	3100807-04	10/16/2020 10:52
17	E2000943-001X2		20201016_019	Perchlorate6850b.lcm	2x	☒		10/16/2020 11:06
18	E2000944-001X10		20201016_020	Perchlorate6850b.lcm	10x	☒		10/16/2020 11:14
19	E2000944-002X200		20201016_021	Perchlorate6850b.lcm	200x	☒		10/16/2020 11:22
20	E2000944-003X200		20201016_022	Perchlorate6850b.lcm	200x	☒		10/16/2020 11:30
21	E2000944-004X200		20201016_023	Perchlorate6850b.lcm	200x	☒		10/16/2020 11:38
22	E2000944-005X100		20201016_024	Perchlorate6850b.lcm	100x	☒		10/16/2020 11:46
23	E2000944-006X1000		20201016_025	Perchlorate6850b.lcm	1000x	☒		10/16/2020 11:54
24	EQ2000497-05		20201016_027	Perchlorate6850b.lcm	10x	☒		10/16/2020 12:09
25	PERCHLORATE7		20201016_028	Perchlorate6850b.lcm	1x	☒	3100807-04	10/16/2020 12:17
26	EQ2000497-04		20201016_029	Perchlorate6850b.lcm	10x	☒		10/16/2020 12:25
27	PERCHLORATE7		20201016_030	Perchlorate6850b.lcm	1x	☒	3100807-04	10/16/2020 12:36
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20080476

Service Request: E2000944
Date Analyzed: 10/16/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201016\20201016_007

Calibration Date: 9/15/20
Calibration ID: EC2000032
Analysis Lot: 699559
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.82	NA	NA	NA	-1.8	± 15 %	Quadratic

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20080476

Service Request: E2000944
Date Analyzed: 10/16/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201016\20201016_018

Calibration Date: 9/15/20
Calibration ID: EC2000032
Analysis Lot: 699559
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.4	NA	NA	NA	4.3	± 15 %	Quadratic

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20080476

Service Request: E2000944
Date Analyzed: 10/16/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201016\20201016_028

Calibration Date: 9/15/20
Calibration ID: EC2000032
Analysis Lot: 699559
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.2	NA	NA	NA	1.8	± 15 %	Quadratic

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20080476

Service Request: E2000944
Date Analyzed: 10/16/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201016\20201016_030

Calibration Date: 9/15/20
Calibration ID: EC2000032
Analysis Lot: 699559
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.2	NA	NA	NA	2.2	± 15 %	Quadratic

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20080476

Service Request: E2000944
Date Analyzed: 10/16/20 09:21

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID: I:\LCMS01\DATA\20201016\20201016_007
Instrument ID: E-LCMS-01
Analytical Method: 6850

Lab Code: EQ2000509-01
Analysis Lot: 699559
Signal ID: 1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	160,593	3.24
	Upper Limit ==>	240,890	5.24
	Lower Limit ==>	80,297	1.24
Associated Analyses			
Continuing Calibration Verification	EQ2000509-01	140,874	3.09

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20080476

Service Request: E2000944
Date Analyzed: 10/16/20 10:52

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID: I:\LCMS01\DATA\20201016\20201016_018
Instrument ID: E-LCMS-01
Analytical Method: 6850

Lab Code: EQ2000509-02
Analysis Lot: 699559
Signal ID: 1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	160,593	3.24
	Upper Limit ==>	240,890	5.24
	Lower Limit ==>	80,297	1.24
Associated Analyses			
Continuing Calibration Verification	EQ2000509-02	134,004	3.10
50WW14-201001	E2000944-001	127,843	3.09
50WW13-201001	E2000944-002	130,591	3.09
50WW11-201001	E2000944-003	114,992	3.09
50WW11-201001-FD	E2000944-004	103,249	3.10
50WW06-201001	E2000944-005	119,706	3.09
50WW12-201001	E2000944-006	110,535	3.10
50WW14-201001DMS	EQ2000497-05	124,382	3.09

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20080476	**Date Analyzed:**	10/16/20 12:17

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201016\20201016_028	**Lab Code:**	EQ2000509-03
Instrument ID:	E-LCMS-01	**Analysis Lot:**	699559
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	160,593	3.24
	Upper Limit ==>	240,890	5.24
	Lower Limit ==>	80,297	1.24
Associated Analyses			
Continuing Calibration Verification	EQ2000509-03	137,447	3.09
50WW14-201001MS	EQ2000497-04	138,818	3.06

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000944
Project:	HS20080476	**Date Analyzed:**	10/16/20 12:36

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201016\20201016_030	**Lab Code:**	EQ2000509-04
Instrument ID:	E-LCMS-01	**Analysis Lot:**	699559
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	160,593	3.24
	Upper Limit ==>	240,890	5.24
	Lower Limit ==>	80,297	1.24
Associated Analyses			
Continuing Calibration Verification	EQ2000509-04	140,968	3.05

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group Houston

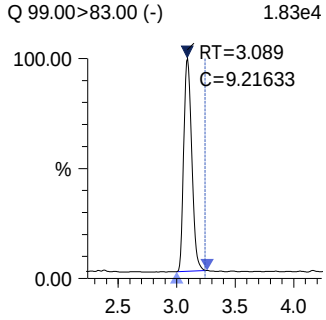
PERCHLORATE7

Date acquired: 10/9/2020 3:08:25 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201009\20201009_005.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/9/2020 3:08:25 PM	86435	9.21633	20201009_005	3.089	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/9/2020 3:08:25 PM	88538	1.00000	20201009_005	3.087	25.0000	1.0000	4

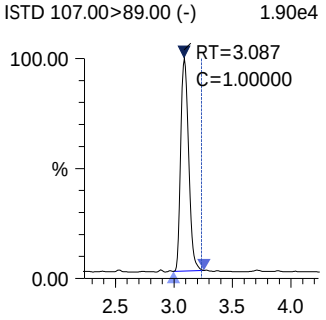
Perchlorate

Conc 9.21633
Area 86435



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 88538



ALS Group Houston

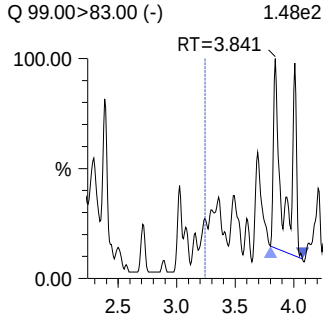
EQ2000497-01

Date acquired: 10/9/2020 3:24:21 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201009\20201009_007.lcd
Vial: 16 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000497-01	10/9/2020 3:24:21 PM	----	----	20201009_007	----	25.0000	1.0000	16
Sodium Perchlorate-18O4_IS	EQ2000497-01	10/9/2020 3:24:21 PM	96808	1.00000	20201009_007	3.098	25.0000	1.0000	16

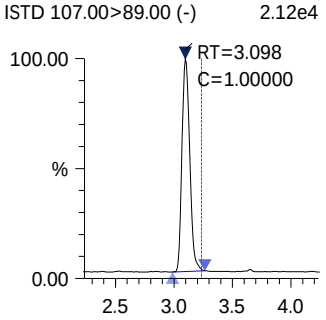
Perchlorate

Conc ----
Area ----



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 96808



ALS Group Houston

EQ2000497-02

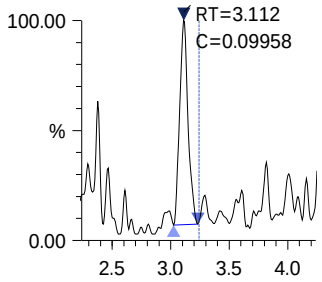
Date acquired: 10/9/2020 3:32:16 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201009\20201009_008.lcd
Vial: 17 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000497-02	10/9/2020 3:32:16 PM	1240	0.09958	20201009_008	3.112	25.0000	1.0000	17
Sodium Perchlorate-18O4_IS	EQ2000497-02	10/9/2020 3:32:16 PM	102528	1.00000	20201009_008	3.102	25.0000	1.0000	17

Perchlorate

Conc 0.09958
Area 1240

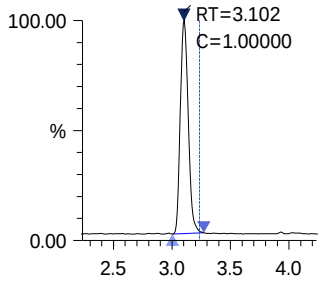
Q 99.00>83.00 (-) 2.59e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 102528

ISTD 107.00>89.00 (-) 2.19e4



ALS Group Houston

EQ2000497-03

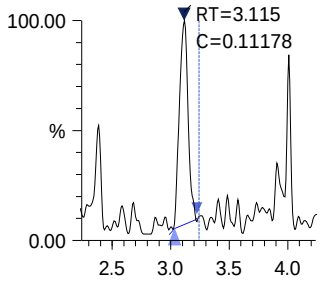
Date acquired: 10/9/2020 3:40:10 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201009\20201009_009.lcd
Vial: 18 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000497-03	10/9/2020 3:40:10 PM	1391	0.11178	20201009_009	3.115	25.0000	1.0000	18
Sodium Perchlorate-18O4_IS	EQ2000497-03	10/9/2020 3:40:10 PM	103828	1.00000	20201009_009	3.100	25.0000	1.0000	18

Perchlorate

Conc 0.11178
Area 1391

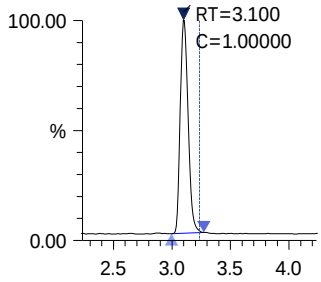
Q 99.00>83.00 (-) 3.62e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 103828

ISTD 107.00>89.00 (-) 2.24e4



ALS Group Houston

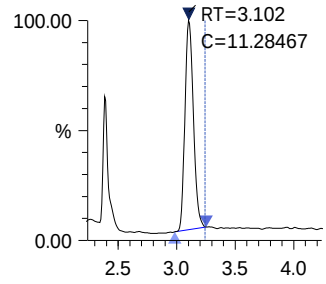
PERCHLORATE7

Date acquired: 10/9/2020 4:43:14 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201009\20201009_017.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/9/2020 4:43:14 PM	105826	11.28467	20201009_017	3.102	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/9/2020 4:43:14 PM	88721	1.00000	20201009_017	3.101	25.0000	1.0000	4

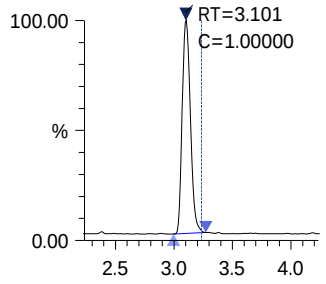
Perchlorate

Conc 11.28467
Area 105826



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 88721



ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

October 08, 2020

Analytical Report for Service Request No: K2008877

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: HS20100074

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 06, 2020
For your reference, these analyses have been assigned our service request number **K2008877.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

for Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

Table of Contents

Acronyms
Qualifiers
State Certifications, Accreditations, And Licenses
Case Narrative
Chain of Custody
General Chemistry
Raw Data
    General Chemistry

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
LOD	Limit of Detection
LOQ	Limit of Quantitation
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.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
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.
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.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

Client: ALS Environmental - US
Project: HS20100074
Sample Matrix: Ground Water

Service Request: K2008877
Date Received: 10/06/2020

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 ground water samples were received for analysis at ALS Environmental on 10/06/2020. 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.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Mae D. Davis Date 10/08/2020

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

K2008877

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:** **14817**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626

Phone: +1 360 501 3312

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:	HS20100074
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20100074-01**	**50WW14-201001**	**Groundwater**	**01 Oct 2020 07:55**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			09 Oct 2020
2.	**HS20100074-02**	**50WW13-201001**	**Groundwater**	**01 Oct 2020 09:05**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			09 Oct 2020
3.	**HS20100074-03**	**50WW11-201001**	**Groundwater**	**01 Oct 2020 09:55**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			09 Oct 2020
4.	**HS20100074-04**	**50WW11-201001-FD**	**Groundwater**	**01 Oct 2020 09:55**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			09 Oct 2020
5.	**HS20100074-05**	**50WW06-201001**	**Groundwater**	**01 Oct 2020 10:50**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			09 Oct 2020
6.	**HS20100074-06**	**50WW12-201001**	**Groundwater**	**01 Oct 2020 11:40**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			09 Oct 2020

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

HS20100074-01 MS/MSD

QC Level: DOD IV (DoD Data Package)

Received by Mlederer 10/6/2020 0945

K2008877

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **14817**

Relinquished By: 10/5/2020 Date/Time: 18:10.

Received By: Date/Time: 10/6/2020 0945

Cooler ID(s): Temperature(s):

PM KL

Cooler Receipt and Preservation Form

Client AIS Houston Service Request K20 08877

Received: 10/6/2020 Opened: 10/6/2020 By: MP Unloaded: 10/6/2020 By: MP

1. Samples were received via? *USPS* *(Fed Ex)* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *(Cooler)* *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2 Front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N
4. Was a Temperature Blank present in cooler? NA (Y) N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA (Y) N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. (NA) Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
0.9	—	IR01		—	—	1891 8881 1876	
			14815				
			14817				
			14811				

6. Packing material: *Inserts* *(Baggies)* *(Bubble Wrap)* *Gel Packs* *(Wet Ice)* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
8. Were samples received in good condition (unbroken) NA (Y) N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA (Y) N
10. Did all sample labels and tags agree with custody papers? NA (Y) N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA (Y) N
13. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
14. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: _____

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K2008877
Project:	HS20100074	**Date Collected:**	10/1/20
Sample Matrix:	Ground Water	**Date Received:**	10/6/20
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
50WW14-201001	K2008877-001	**1.58**	0.50	0.20	0.07	1	10/07/20 18:15	
50WW13-201001	K2008877-002	**3.54**	0.50	0.20	0.07	1	10/07/20 18:15	
50WW11-201001	K2008877-003	**1.82**	0.50	0.20	0.07	1	10/07/20 18:15	
50WW11-201001-FD	K2008877-004	**1.86**	0.50	0.20	0.07	1	10/07/20 18:15	
50WW06-201001	K2008877-005	**6.09**	0.50	0.20	0.07	1	10/07/20 18:15	
50WW12-201001	K2008877-006	**1.14**	0.50	0.20	0.07	1	10/07/20 18:15	
Method Blank	K2008877-MB	ND U	0.50	0.20	0.07	1	10/07/20 18:15	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2008877
Project	HS20100074	**Date Collected:**	10/01/20
Sample Matrix:	Ground Water	**Date Received:**	10/06/20
		Date Analyzed:	10/07/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	50WW14-201001	**Units:**	mg/L
Lab Code:	K2008877-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K2008877-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	1.58	1.56	1.57	1	10

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

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2008877
Project:	HS20100074	**Date Collected:**	10/01/20
Sample Matrix:	Ground Water	**Date Received:**	10/06/20
		Date Analyzed:	10/7/20
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	50WW14-201001	**Units:**	mg/L
Lab Code:	K2008877-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K2008877-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	1.58	28.0	25.0	106	83-117

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.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2008877
Project:	HS20100074	**Date Analyzed:**	10/07/20
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	698234

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2008877-LCS	24.1	25.0	96	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K2008877
Project: HS20100074

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	698234	KQ2014960-09	10/07/20 18:15	25.0	25.9	103	90-110
CCV2	698234	KQ2014960-10	10/07/20 18:15	25.0	25.4	102	90-110
CCV3	698234	KQ2014960-11	10/07/20 18:15	25.0	24.9	100	90-110
CCV4	698234	KQ2014960-12	10/07/20 18:15	25.0	25.2	101	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K2008877
Project: HS20100074

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

Analysis Method: SM 5310 C **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	698234	KQ2014960-05	10/07/20 18:15	0.50	0.20	0.07	ND	U
CCB2	698234	KQ2014960-06	10/07/20 18:15	0.50	0.20	0.07	ND	U
CCB3	698234	KQ2014960-07	10/07/20 18:15	0.50	0.20	0.07	ND	U
CCB4	698234	KQ2014960-08	10/07/20 18:15	0.50	0.20	0.07	ND	U

Raw Data

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

Work Request # 8311 8157 8557 8870 8740

Tier: II IV II IV IV

Date Analyzed: 10-6-20

Analyst: MK

Run # 698234 / 698233

Analysis: TOC / DOC

DATA QUALITY REPORT
INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1.	Is the method name and number correct and appropriate?	yes/no/NA
2.	Holding times met for all analyses and for all samples?	yes/no/NA
3.	Are calculations correct?	yes/no/NA
4.	Is the reporting basis correct? (Dry Weight)	yes/no/NA
5.	All quality control criteria met?	yes/no
6.	Is the calibration curve correlation coefficient ≥ 0.995?	yes/no/NA
7.	MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?	yes/no/NA
8.	Are ICVs, CCVs, and CCBs all within acceptance limits?	yes/no/NA
9.	Are results for methods blanks all ND?	yes/no/NA
10.	Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)	yes/no/NA
11.	Are all exceptions explained?	yes/no/NA
12.	Have all applicable service requests been reviewed?	yes/no/NA
13.	Are all samples labeled correctly?	yes/no/NA
14.	Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V)	yes/no/NA
15.	Are detection limits and units reported correctly?	yes/no/NA
16.	Is the unused space on the benchsheet crossed out?	yes/no/NA
17.	Was analysis turned in by the due date? (n-2) (If not record SR#)	yes/no/NA

COMMENTS:

Final Approved by: _____ Date: 10/7/20

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-01 **Analyst:** MKANALY **Analysis Lot:** 698233 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K2008311-001	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.28 mg/L	10 mL	1.28 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-002	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.77 mg/L	10 mL	1.77 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-003	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	0.54 mg/L	10 mL	0.54 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-004	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.07 mg/L	10 mL	1.07 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-005	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.41 mg/L	10 mL	1.41 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-006	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.45 mg/L	10 mL	2.45 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-007	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.63 mg/L	10 mL	2.63 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-008	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.59 mg/L	10 mL	2.59 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-009	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.61 mg/L	10 mL	2.61 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-010	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	0.94 mg/L	10 mL	0.94 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-011	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.53 mg/L	10 mL	2.53 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
K2008311-012	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.54 mg/L	10 mL	2.54 mg/L	1	0.07	0.50			10/6/20 18:15:00	N	II
KQ2014958-01	Carbon, Dissolved Organic (DOC)	MB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/6/20 18:15:00	N	II
KQ2014958-02	Carbon, Dissolved Organic (DOC)	LCS		Surface Water	23.68 mg/L	10 mL	23.7 mg/L	1	0.07	0.50	95		10/6/20 18:15:00	N	II
KQ2014958-03	Carbon, Dissolved Organic (DOC)	DLCS		Surface Water	23.79 mg/L	10 mL	23.8 mg/L	1	0.07	0.50	95	<1	10/6/20 18:15:00	N	II
KQ2014958-04	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/6/20 18:15:00	N	II
KQ2014958-05	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/6/20 18:15:00	N	II
KQ2014958-06	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/6/20 18:15:00	N	II
KQ2014958-07	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/6/20 18:15:00	N	II
KQ2014958-08	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	25.86 mg/L	10 mL	25.9 mg/L	1					10/6/20 18:15:00	N	II
KQ2014958-09	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	25.38 mg/L	10 mL	25.4 mg/L	1					10/6/20 18:15:00	N	II
KQ2014958-10	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.90 mg/L	10 mL	24.9 mg/L	1					10/6/20 18:15:00	N	II
KQ2014958-11	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	25.21 mg/L	10 mL	25.2 mg/L	1					10/6/20 18:15:00	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-01 **Analyst:** MKANALY **Analysis Lot:** 698234 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K2008157-001	Carbon, Total Organic	N/A		Water	2.34 mg/L	10 mL	2.34 mg/L	1	0.07	0.50			10/7/20 18:15:00	N	IV
K2008557-001	Carbon, Total Organic	N/A		Water	5.30 mg/L	10 mL	5.30 mg/L	1	0.07	0.50			10/7/20 18:15:00	N	II
K2008740-001	Carbon, Total Organic	N/A		Water	2.17 mg/L	10 mL	2.17 mg/L	1	0.07	0.50			10/7/20 18:15:00	N	IV
K2008877-001	Carbon, Total Organic	N/A		Ground Water	1.58 mg/L	10 mL	1.58 mg/L	1	0.07	0.50			10/7/20 18:15:00	Y	IV
K2008877-002	Carbon, Total Organic	N/A		Ground Water	3.54 mg/L	10 mL	3.54 mg/L	1	0.07	0.50			10/7/20 18:15:00	N	IV
K2008877-003	Carbon, Total Organic	N/A		Ground Water	1.82 mg/L	10 mL	1.82 mg/L	1	0.07	0.50			10/7/20 18:15:00	N	IV
K2008877-004	Carbon, Total Organic	N/A		Ground Water	1.86 mg/L	10 mL	1.86 mg/L	1	0.07	0.50			10/7/20 18:15:00	N	IV
K2008877-005	Carbon, Total Organic	N/A		Ground Water	6.09 mg/L	10 mL	6.09 mg/L	1	0.07	0.50			10/7/20 18:15:00	N	IV
K2008877-006	Carbon, Total Organic	N/A		Ground Water	1.14 mg/L	10 mL	1.14 mg/L	1	0.07	0.50			10/7/20 18:15:00	N	IV
KQ2014960-01	Carbon, Total Organic	DUP	K2008877-001	Ground Water	1.56 mg/L	10 mL	1.56 mg/L	1	0.07	0.50		1	10/7/20 18:15:00	N	IV
KQ2014960-02	Carbon, Total Organic	MS	K2008877-001	Ground Water	28.02 mg/L	10 mL	28.0 mg/L	1	0.07	0.50	106		10/7/20 18:15:00	N	IV
KQ2014960-03	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/7/20 18:15:00	N	IV
KQ2014960-04	Carbon, Total Organic	LCS		Water	24.09 mg/L	10 mL	24.1 mg/L	1	0.07	0.50	96		10/7/20 18:15:00	N	IV
KQ2014960-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/7/20 18:15:00	N	IV
KQ2014960-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/7/20 18:15:00	N	IV
KQ2014960-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/7/20 18:15:00	N	IV
KQ2014960-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/7/20 18:15:00	N	IV
KQ2014960-09	Carbon, Total Organic	CCV		Water	25.86 mg/L	10 mL	25.9 mg/L	1					10/7/20 18:15:00	N	IV
KQ2014960-10	Carbon, Total Organic	CCV		Water	25.38 mg/L	10 mL	25.4 mg/L	1					10/7/20 18:15:00	N	IV
KQ2014960-11	Carbon, Total Organic	CCV		Water	24.90 mg/L	10 mL	24.9 mg/L	1					10/7/20 18:15:00	N	IV
KQ2014960-12	Carbon, Total Organic	CCV		Water	25.21 mg/L	10 mL	25.2 mg/L	1					10/7/20 18:15:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Schedule: 100620

Version: 7
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2020/10/07 08:07 - Wednesday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K2008157-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K2008877-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
5	Sample	K2008877-001D	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
6	Sample	K2008877-001MS	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K2008877-002	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K2008877-003	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K2008877-004	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K2008877-005	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K2008877-006	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K2008311-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K2008311-002	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K2008311-003	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K2008311-004	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K2008311-005	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
17	Sample	K2008311-006	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K2008311-007	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
19	Sample	K2008311-008	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
22	Sample	K2008311-009	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K2008311-010	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K2008311-011	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K2008311-012	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K2008311-005	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K2008311-007	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K2008311-008	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K2008557-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K208740-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

Fusion Report - 100620
Tuesday, October 06, 2020 06:15 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2020/10/07 11:56 - Wednesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	100620	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v1) Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v4) Fusion1 (Fusion1) (v5) Fusion1 (Fusion1) (v7)		
Comment:			

Report Results

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/10/06 18:15

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.41	27.59	14.18	49.65	05:27
2	TC Clean	8.03	21.21	13.18	49.84	07:17
3	TC Clean	1.28	14.58	13.30	49.75	07:00
4	TC Clean	0.76	14.06	13.30	50.00	07:03

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/10/06 18:47

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	-0.20	13.01	13.21	49.62	05:25
2	TC Clean	3.49	16.68	13.19	49.77	07:18

3	TC Clean	0.64	13.85	13.21	50.00	07:03
4	TC Clean	0.47	13.55	13.08	49.87	07:02

Sample Type: Clean From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/10/06 19:18

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	-0.51	12.67	13.18	49.67	05:17
2	TC Clean	3.48	16.35	12.87	49.76	07:16
3	TC Clean	0.39	13.46	13.07	49.89	07:02
4	TC Clean	0.29	13.36	13.07	49.77	07:02

Sample Type: Blank (Creating v1457) From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2020/10/06 19:50

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	-0.52	12.41	12.93	49.71	05:18
2	TC Clean	3.73	16.66	12.93	49.66	07:15
3	TC Clean	0.71	13.83	13.12	49.64	07:00
4	TC Clean	0.66	13.90	13.24	49.92	07:02
5	Reagent Blank	5.08	18.08	13.00	49.78	08:13
6	Acid Blank	-0.13	12.89	13.02	49.85	08:02

Sample Type: Sample From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/10/06 20:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.97	22.00	13.04	49.83	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.8559 ppm (PASS)	0.0000 ppm	0%	2020/10/06 20:58

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.8559	258.5594	191.27	204.27	13.01	49.94	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 4

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/10/06 21:12

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.74	20.71	12.98	49.85	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample From Schedule Version 4

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2020/10/06 21:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.62	20.42	12.80	49.99	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> LCS From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.0885 ppm (PASS)	0.0000 ppm	0%	2020/10/06 21:42

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.0885	240.8854	178.87	191.80	12.93	49.92	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	25 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	2	TOC	ICS	0.0819 ppm	0.0000 ppm	0.0000%	2020/10/06 21:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0819	0.8188	9.82	22.51	12.69	49.89	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	3	TOC	K2008157-001	2.3388 ppm	0.1008 ppm	4.3100%	2020/10/06 22:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4101	24.1009	26.15	38.83	12.68	50.03	10:31
2	TOC	2.2675	22.6753	25.15	38.05	12.90	49.99	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	4	TOC	K2008877-001	1.5821 ppm	0.0274 ppm	1.7300%	2020/10/06 22:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6015	16.0152	20.48	33.42	12.95	49.96	10:25
2	TOC	1.5627	15.6274	20.20	33.25	13.04	49.95	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	5	TOC	K2008877-001D	1.5647 ppm	0.0668 ppm	4.2700%	2020/10/06 23:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6119	16.1192	20.55	33.17	12.62	49.94	10:29
2	TOC	1.5174	15.1741	19.89	33.01	13.12	49.93	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K2008877-001MS	28.0161 ppm	0.0492 ppm	0.1800%	2020/10/06 23:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.9814	279.8136	205.53	218.52	12.99	49.94	10:28
2	TOC	28.0509	280.5092	206.01	219.09	13.08	49.94	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K2008877-002	3.5402 ppm	0.1013 ppm	2.8600%	2020/10/07 00:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.6118	36.1183	34.58	47.62	13.04	49.94	10:30
2	TOC	3.4686	34.6856	33.57	46.63	13.05	49.95	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K2008877-003	1.8176 ppm	0.0053 ppm	0.2900%	2020/10/07 00:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8213	18.2134	22.02	35.06	13.04	49.95	10:31
2	TOC	1.8138	18.1378	21.96	34.95	12.99	49.96	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K2008877-004	1.8570 ppm	0.0175 ppm	0.9400%	2020/10/07 01:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8694	18.6938	22.35	35.39	13.03	49.97	10:27
2	TOC	1.8446	18.4457	22.18	35.16	12.98	49.97	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.3819 ppm (PASS)	0.0000 ppm	0%	2020/10/07 01:27

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.3819	253.8195	187.94	200.90	12.96	49.96	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/10/07 01:42

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.59	20.69	13.10	50.00	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K2008877-005	6.0944 ppm	0.0221 ppm	0.3600%	2020/10/07 01:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.0787	60.7875	51.88	65.00	13.12	49.99	10:26
2	TOC	6.1100	61.0997	52.10	65.18	13.08	50.00	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K2008877-006	1.1383 ppm	0.0134 ppm	1.1800%	2020/10/07 02:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1478	11.4776	17.29	30.30	13.01	50.04	10:26
2	TOC	1.1288	11.2880	17.16	30.11	12.95	50.04	10:25

Dilution	Blank Contribution	Method	Calibration

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K2008311-001	1.2840 ppm	0.0012 ppm	0.0900%	2020/10/07 02:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2832	12.8319	18.24	31.38	13.14	50.04	10:25
2	TOC	1.2849	12.8490	18.26	31.32	13.07	50.05	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K2008311-002	1.7744 ppm	0.0365 ppm	2.0600%	2020/10/07 03:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7486	17.4863	21.51	34.66	13.15	50.05	10:29
2	TOC	1.8002	18.0024	21.87	34.80	12.93	50.05	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K2008311-003	0.5426 ppm	0.0216 ppm	3.9800%	2020/10/07 03:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5274	5.2736	12.94	26.10	13.16	50.07	10:27
2	TOC	0.5579	5.5787	13.16	26.24	13.08	50.07	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K2008311-004	1.0718 ppm	0.0310 ppm	2.9000%	2020/10/07 04:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0498	10.4983	16.61	29.82	13.21	50.07	10:26
2	TOC	1.0937	10.9373	16.91	30.00	13.08	50.09	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K2008311-005	1.4339 ppm	0.0000 ppm	0.0000%	2020/10/07 04:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4339	14.3387	19.30	32.25	12.95	50.12	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	17	TOC	K2008311-006	2.4503 ppm	0.0069 ppm	0.2800%	2020/10/07 05:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4454	24.4544	26.40	39.68	13.29	50.12	10:27
2	TOC	2.4551	24.5514	26.46	39.48	13.02	50.12	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	18	TOC	K2008311-007	2.6971 ppm	0.0000 ppm	0.0000%	2020/10/07 05:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6971	26.9705	28.16	41.38	13.22	50.13	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	19	TOC	K2008311-008	2.6425 ppm	0.0000 ppm	0.0000%	2020/10/07 05:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6425	26.4245	27.78	41.02	13.25	50.14	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.8974 ppm (PASS)	0.0000 ppm	0%	2020/10/07 05:57

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.8974	248.9740	184.54	197.90	13.36	50.16	10:27

Completion State	Success Action	Method	Calibration	STD Conc - Pos B

Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/10/07 06:11

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.86	21.08	13.22	50.16	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2020/10/07 06:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.82	21.20	13.38	50.18	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> LCS From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	23.6770 ppm (PASS)	0.0000 ppm	0%	2020/10/07 06:41

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	23.6770	236.7699	175.98	189.20	13.22	50.19	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	25 ppmC

Sample Type: Check Standard --> LCS From Schedule Version 5

	Pos	BAT	Concentration	Dil	Sample ID	Min / Max	Result	Std. Dev.	RSD	Start Time

			(ppm)			(% dev)				
◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	23.7946 ppm (PASS)	0.0000 ppm	0%	2020/10/07 06:55

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	23.7946	237.9459	176.81	190.08	13.28	50.19	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	25 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	22	TOC	K2008311-009	2.6083 ppm	0.0249 ppm	0.9500%	2020/10/07 07:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5907	25.9071	27.42	40.72	13.30	50.18	10:27
2	TOC	2.6259	26.2592	27.66	40.84	13.18	50.18	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	23	TOC	K2008311-010	0.9351 ppm	0.0634 ppm	6.7800%	2020/10/07 07:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8903	8.9031	15.49	28.77	13.28	50.16	10:29
2	TOC	0.9800	9.7997	16.12	29.31	13.19	50.15	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Sample From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	24	TOC	K2008311-011	2.5265 ppm	0.0001 ppm	0.0000%	2020/10/07 08:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5264	25.2641	26.96	40.12	13.16	50.11	10:28
2	TOC	2.5266	25.2656	26.96	40.26	13.29	50.15	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	25	TOC	K2008311-012	2.5421 ppm	0.0321 ppm	1.2600%	2020/10/07 08:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5194	25.1943	26.92	40.18	13.27	50.16	10:28
2	TOC	2.5648	25.6476	27.23	40.33	13.10	50.09	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	16	TOC	K2008311-005	1.4069 ppm	0.0034 ppm	0.2400%	2020/10/07 09:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4045	14.0450	19.09	32.07	12.98	50.04	10:26
2	TOC	1.4094	14.0935	19.13	32.25	13.12	50.03	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	18	TOC	K2008311-007	2.6313 ppm	0.0468 ppm	1.7800%	2020/10/07 09:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5983	25.9826	27.47	40.64	13.17	50.00	10:28
2	TOC	2.6644	26.6441	27.93	41.08	13.15	50.04	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	19	TOC	K2008311-008	2.5927 ppm	0.0030 ppm	0.1200%	2020/10/07 10:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5948	25.9484	27.44	40.63	13.18	50.06	10:27
2	TOC	2.5906	25.9056	27.41	40.61	13.19	50.04	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	26	TOC	K2008557-001	5.2985 ppm	0.0286 ppm	0.5400%	2020/10/07 10:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.3188	53.1878	46.55	59.41	12.86	49.96	10:26

2	TOC	5.2783	52.7830	46.27	59.06	12.79	50.13	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	27	TOC	K208740-001	2.1675 ppm	0.0083 ppm	0.3800%	2020/10/07 10:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1616	21.6161	24.40	37.49	13.09	50.02	10:29
2	TOC	2.1733	21.7330	24.49	37.36	12.87	49.96	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2416 (IC) (v1457)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.2062 ppm (PASS)	0.0000 ppm	0%	2020/10/07 11:24

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.2062	252.0618	186.71	199.68	12.97	50.04	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/10/07 11:39

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.83	20.99	13.16	49.99	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1456	1.6967	0.1340	0.0000	0.0000	0.0000	2020/10/05 21:31	Fusion1 (Fusion1)
v1457	1.6940	-0.1340	0.0000	0.0000	0.0000	2020/10/06 20:38	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v38
Ver Creation: 2020/06/13 16:40
Comment:
Operator: Fusion1 (Fusion1)
Basic Analysis Type: TOC
Calibration curve formula: TOC: y = 7.015x + 9.892
r^2 value: TOC: r^2 = 0.99974

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	9.5750	0.0000		2020/06/13 15:13
0.500 ppm	12.9010	0.5000		2020/06/13 15:28
1.0 ppm	15.6320	1.0000		2020/06/13 15:42
5.0 ppm	43.2510	5.0000		2020/06/13 15:56
10 ppm	82.4040	10.0000		2020/06/13 16:11
25 ppm	188.6880	25.0000		2020/06/13 16:25
50 ppm	358.6500	50.0000		2020/06/13 16:39

Methods

Name: CAS_salt_010711 (TOC)

Version: v4
Ver Creation: 2019/02/21 17:57
Comment:
Operator: Fusion1 (Fusion1)

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7

PreSpargeTime	2.00 mins	SyringeSpeedDIWater	7
SystemFlow	500 ml/min	NDIRPressurization	60 psig
		SyringeSpeedSampleDispense	5
		SyringeSpeedSampleAspirate	4
		SyringeSpeedUVDispense	5
		SyringeSpeedUVAspirate	5
		SyringeSpeedICDispense	5
		SyringeSpeedICAspirate	5
		NDIRPressureStabilize	1.75 min
		SampleMixing	Off
		SampleMixingCycles	1
		SampleMixingVolume	10.0
		LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2020/10/07 11:53

ALS Environmental

StarLIMS Ru 698233/698234

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 19-GEN-8-40-C 50 ppm LCS: 19-GEN-8-41-k 25.0 ppm

ICAL Date: 6/16/2020

ICAL ID: 19-GEN-8-22-G

ICS ID: 19-GEN-8-35-J

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 19-GEN-8-15-B 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 19-GEN-08-45-J

21 % H3PO4: 19-GEN-08-46-F

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

Analyzed By: MK	Date Analyzed: 10-6-20
Reviewed By: CK	Date Reviewed: 10/7/20

LABORATORY REPORT

October 16, 2020

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road Suite 210
Houston, TX 77099-4338

RE: HS20100074

Dear RJ:

Enclosed are the results of the samples submitted to our laboratory on October 6, 2020. For your reference, these analyses have been assigned our service request number P2005613.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Hayden Akers at 3:51 pm, Oct 16, 2020

Hayden Akers
Project Manager

Client: ALS Laboratory Group Service Request No: P2005613
Project: HS20100074

CASE NARRATIVE

The samples were received intact under chain of custody on October 6, 2020 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Carbon Dioxide Analysis

The samples were analyzed for carbon dioxide using a gas chromatograph equipped with a thermal conductivity detector (TCD). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least four hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (carbon dioxide) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175 as described in laboratory SOP VOA-DISGAS. This analyte is included on the laboratory's NELAP and DoD-ELAP scope of accreditation.

Methane, Ethene and Ethane Analysis

The samples were also analyzed for methane, ethene, and ethane using a gas chromatograph equipped with a flame ionization detector (FID). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least two hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (methane, ethene and ethane) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP or DoD-ELAP accreditation.

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 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.

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2018027
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1776326
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-007
Pennsylvania DEP	http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413-19-10
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272019-10
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: ALS Laboratory Group
Project ID: HS20100074

Service Request: P2005613

Date Received: 10/6/2020
Time Received: 11:10

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - CO2	RSK 175 - Gases
50WW14-201001	P2005613-001	Water	10/1/2020	07:55	X	X
50WW13-201001	P2005613-002	Water	10/1/2020	09:05	X	X
50WW11-201001	P2005613-003	Water	10/1/2020	09:55	X	X
50WW11-201001-FD	P2005613-004	Water	10/1/2020	09:55	X	X
50WW06-201001	P2005613-005	Water	10/1/2020	10:50	X	X
50WW12-201001	P2005613-006	Water	10/1/2020	11:40	X	X

PJ005613

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:** **14816**

SUBCONTRACT TO:

ALS Environmental
2655 Park Center Drive, Suite A
Simi Valley, CA 93065

Phone: +1 805 526 7161

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:	HS20100074
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20100074-01**	**50WW14-201001**	**Groundwater**	**01 Oct 2020 07:55**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			09 Oct 2020
2.	**HS20100074-02**	**50WW13-201001**	**Groundwater**	**01 Oct 2020 09:05**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			09 Oct 2020
3.	**HS20100074-03**	**50WW11-201001**	**Groundwater**	**01 Oct 2020 09:55**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			09 Oct 2020
4.	**HS20100074-04**	**50WW11-201001-FD**	**Groundwater**	**01 Oct 2020 09:55**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			09 Oct 2020
5.	**HS20100074-05**	**50WW06-201001**	**Groundwater**	**01 Oct 2020 10:50**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			09 Oct 2020
6.	**HS20100074-06**	**50WW12-201001**	**Groundwater**	**01 Oct 2020 11:40**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			09 Oct 2020

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

HS20100074-01 MS/MSD

QC Level: DOD IV (DoD Data Package)

P200513

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense**

COC ID: **14816**

Relinquished By: [signature]

Date/Time: 10/5/2020 1800

Received By: [signature]

Date/Time: 10-6-20 1110

2° WET

Cooler ID(s):

Temperature(s):

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P2005613

Project: HS20100074

Sample(s) received on: 10/06/20 Date opened: 10/06/20 by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature: 2° C Blank Temperature: ° C	Wet Ic		
8	Were **custody seals** on outside of cooler/Box/Container?	☒	☐	☐
	Location of seal(s)? _____ Sealing Lid?	☒	☐	☐
	Were signature and date included?	☒	☐	☐
	Were seals intact?	☒	☐	☐
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☒	☐	☐
	Were **VOA vials** checked for presence/absence of air bubbles?	☒	☐	☐
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☒	☐
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2005613-001.01	40mL VOA NP		7		A	wh 10/13/20
P2005613-001.02	40mL VOA NP		7		A	wh 10/13/20
P2005613-001.03	40mL VOA NP		7		A	wh 10/13/20
P2005613-001.04	40ml VOA HCL		1		A	wh 10/13/20
P2005613-001.05	40ml VOA HCL		1		A	wh 10/13/20
P2005613-001.06	40ml VOA HCL		1		A	wh 10/13/20
P2005613-001.07	40mL VOA NP				A	
P2005613-001.08	40mL VOA NP				A	
P2005613-001.09	40mL VOA NP				A	
P2005613-001.10	40mL VOA NP				A	
P2005613-001.11	40mL VOA NP				A	
P2005613-001.12	40mL VOA NP				A	
P2005613-001.13	40ml VOA HCL				A	
P2005613-001.14	40ml VOA HCL				A	
P2005613-001.15	40ml VOA HCL				A	

Explain any discrepancies: (include lab sample ID numbers): _____

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P2005613

Project: HS20100074

Sample(s) received on: 10/06/20 Date opened: 10/06/20 by: ADAVID

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2005613-001.16	40ml VOA HCL				A	
P2005613-001.17	40ml VOA HCL				A	
P2005613-001.18	40ml VOA HCL				A	
P2005613-002.01	40mL VOA NP		7		A	wh 10/13/20
P2005613-002.02	40mL VOA NP				A	
P2005613-002.03	40mL VOA NP				A	
P2005613-002.04	40ml VOA HCL		1		A	wh 10/13/20
P2005613-002.05	40ml VOA HCL				A	
P2005613-002.06	40ml VOA HCL				A	
P2005613-003.01	40mL VOA NP		7		A	wh 10/13/20
P2005613-003.02	40mL VOA NP				A	
P2005613-003.03	40mL VOA NP				A	
P2005613-003.04	40ml VOA HCL		1		A	wh 10/13/20
P2005613-003.05	40ml VOA HCL				A	
P2005613-003.06	40ml VOA HCL				A	
P2005613-004.01	40mL VOA NP		7		A	wh 10/13/20
P2005613-004.02	40mL VOA NP				A	
P2005613-004.03	40mL VOA NP				A	
P2005613-004.04	40ml VOA HCL		1		A	wh 10/13/20
P2005613-004.05	40ml VOA HCL				A	
P2005613-004.06	40ml VOA HCL				A	
P2005613-005.01	40mL VOA NP		7		A	wh 10/13/20
P2005613-005.02	40mL VOA NP				A	
P2005613-005.03	40mL VOA NP				A	
P2005613-005.04	40ml VOA HCL		1		A	wh 10/13/20
P2005613-005.05	40ml VOA HCL				A	
P2005613-005.06	40ml VOA HCL				A	
P2005613-006.01	40mL VOA NP		7		A	wh 10/13/20
P2005613-006.02	40mL VOA NP				A	
P2005613-006.03	40mL VOA NP				A	
P2005613-006.04	40ml VOA HCL		1		A	wh 10/13/20
P2005613-006.05	40ml VOA HCL				A	
P2005613-006.06	40ml VOA HCL				A	

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Project ID: **HS20100074** ALS Project ID: P2005613

Carbon Dioxide

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Wade Henton
Matrix: Liquid
Test Notes:

Date(s) Collected: 10/1/20
Date Received: 10/6/20
Date Analyzed: 10/13/20

Client Sample ID	ALS Sample ID	Injection Volume ml(s)	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
50WW14-201001	P2005613-001	0.10	**170,000**	1,000	860	370	
50WW13-201001	P2005613-002	0.10	**310,000**	1,000	860	370	
50WW11-201001	P2005613-003	0.10	**74,000**	1,000	860	370	
50WW11-201001-FD	P2005613-004	0.10	**79,000**	1,000	860	370	
50WW06-201001	P2005613-005	0.10	**93,000**	1,000	860	370	
50WW12-201001	P2005613-006	0.10	**140,000**	1,000	860	370	
Method Control Sample	P201013-MB	0.10	860	1,000	860	370	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample** ALS Project ID: P2005613
Client Project ID: **HS20100074** ALS Sample ID: P201013-DLCS

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/TCD Date Received: NA
Analyst: Wade Henton Date Analyzed: 10/13/20
Matrix: Liquid Volume(s) Analyzed: NA ml(s)
Test Notes:

CAS #	Compound	Spike Amount LCS / DLCS ug/L	Result$_1$ LCS ug/L	Result$_1$ DLCS ug/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
124-38-9	Carbon Dioxide	22,900	21,700	21,300	**95**	**93**	80-122	2	12	

$_1$ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW14-201001**
Client Project ID: **HS20100074**

ALS Project ID: P2005613
ALS Sample ID: P2005613-001

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: 10/01/20
Date Received: 10/06/20
Date Analyzed: 10/08/20
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**2.2**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW13-201001**
Client Project ID: **HS20100074**

ALS Project ID: P2005613
ALS Sample ID: P2005613-002

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: 10/01/20
Date Received: 10/06/20
Date Analyzed: 10/08/20
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**4.2**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW11-201001**
Client Project ID: **HS20100074**

ALS Project ID: P2005613
ALS Sample ID: P2005613-003

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: 10/01/20
Date Received: 10/06/20
Date Analyzed: 10/08/20
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**4.6**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW11-201001-FD**
Client Project ID: **HS20100074**

ALS Project ID: P2005613
ALS Sample ID: P2005613-004

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: 10/01/20
Date Received: 10/06/20
Date Analyzed: 10/08/20
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**5.1**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW06-201001**
Client Project ID: **HS20100074**

ALS Project ID: P2005613
ALS Sample ID: P2005613-005

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: 10/01/20
Date Received: 10/06/20
Date Analyzed: 10/08/20
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**3.8**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW12-201001**
Client Project ID: **HS20100074**

ALS Project ID: P2005613
ALS Sample ID: P2005613-006

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: 10/01/20
Date Received: 10/06/20
Date Analyzed: 10/08/20
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**0.83**	1.3	1.0	0.51	**J**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **Method Control Sample**
Client Project ID: **HS20100074**

ALS Project ID: P2005613
ALS Sample ID: P201008-MB

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 10/08/20
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	**U**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

MATRIX SPIKE / DUPLICATE MATRIX SPIKE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **50WW14-201001**
Client Project ID: **HS20100074**

ALS Project ID: P2005613
ALS Sample ID: P2005613-001MS
P2005613-001DMS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: 10/1/20
Date Received: 10/6/20
Date Analyzed: 10/8/20
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount MS / DMS µg/L	Sample Amount µg/L	Result MS µg/L	Result DMS µg/L	% Recovery MS	% Recovery DMS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	169	2.17	137	137	**80**	**80**	73-125	0	30	
74-85-1	Ethene	294	ND	293	290	**100**	**99**	72-133	1	30	
74-84-0	Ethane	317	ND	274	273	**86**	**86**	74-131	0	30	

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **HS20100074**

ALS Project ID: P2005613
ALS Sample ID: P201008-LCS
P201008-DLCS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 10/08/20
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount LCS / DLCS µg/L	Result$_1$ LCS µg/L	Result$_1$ DLCS µg/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	2.52	2.81	2.57	**112**	**102**	73-125	9	26	
74-85-1	Ethene	4.40	5.42	5.05	**123**	**115**	72-133	7	11	
74-84-0	Ethane	4.72	5.00	4.75	**106**	**101**	74-131	5	10	

$_1$ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132009.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 15:13:31
Operator : WH
Sample : P2005613-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 15:29:00 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

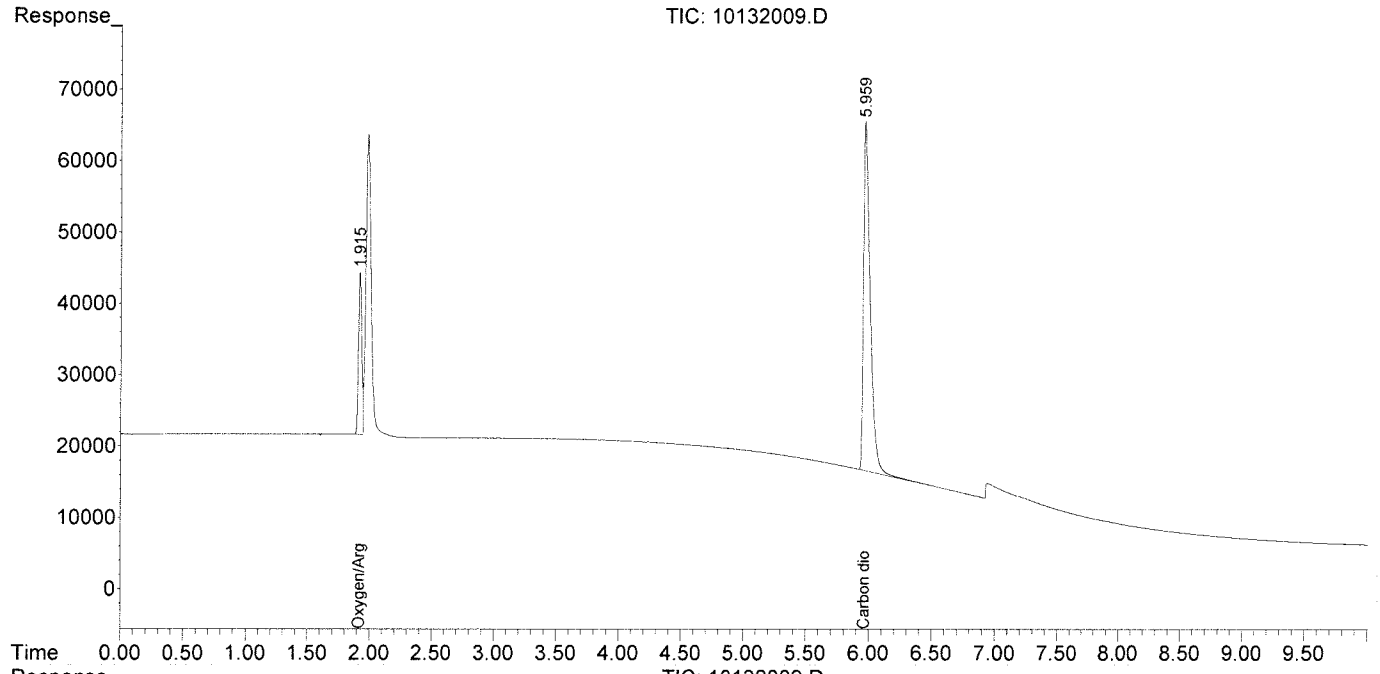
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.916f	402515	0.085	ppm
2)	Carbon monoxide	1.916f	402515	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.960	1842922	7851.271	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

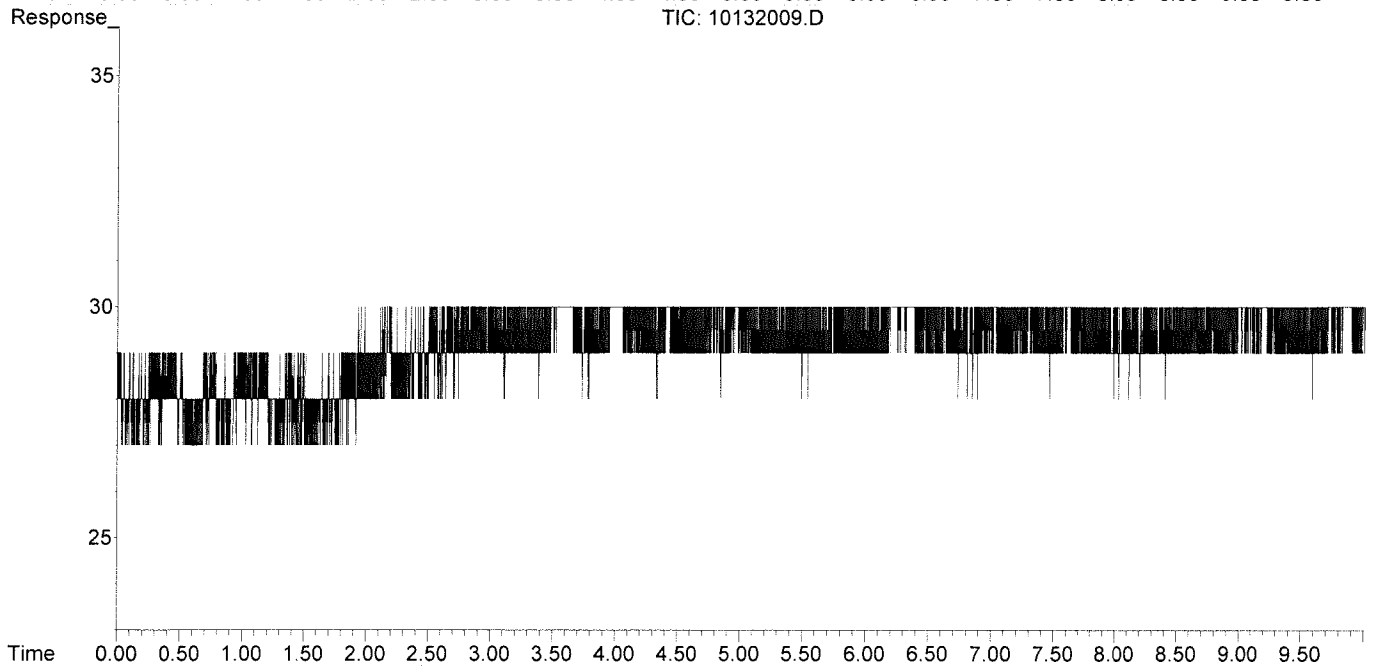
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132009.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 15:13:31
Operator : WH
Sample : P2005613-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 15:29:00 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132010.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 15:27:19
Operator : WH
Sample : P2005613-001ms 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 15:41:51 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

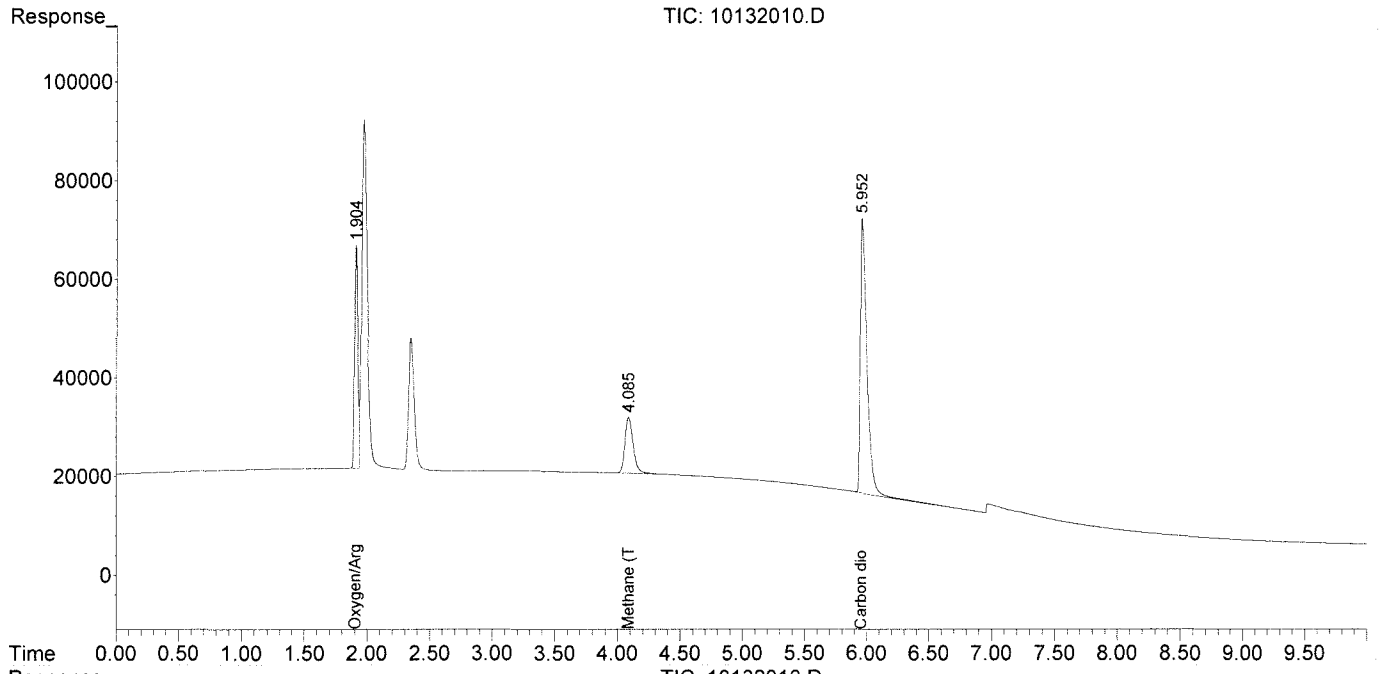
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.905f	780689	0.164	ppm
2)	Carbon monoxide	1.905	780689	N.D.	ppm
3)	Methane (TCD)	4.085f	512932	54236.339	ppm
4)	Carbon dioxide	5.953	2139425	9114.439	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

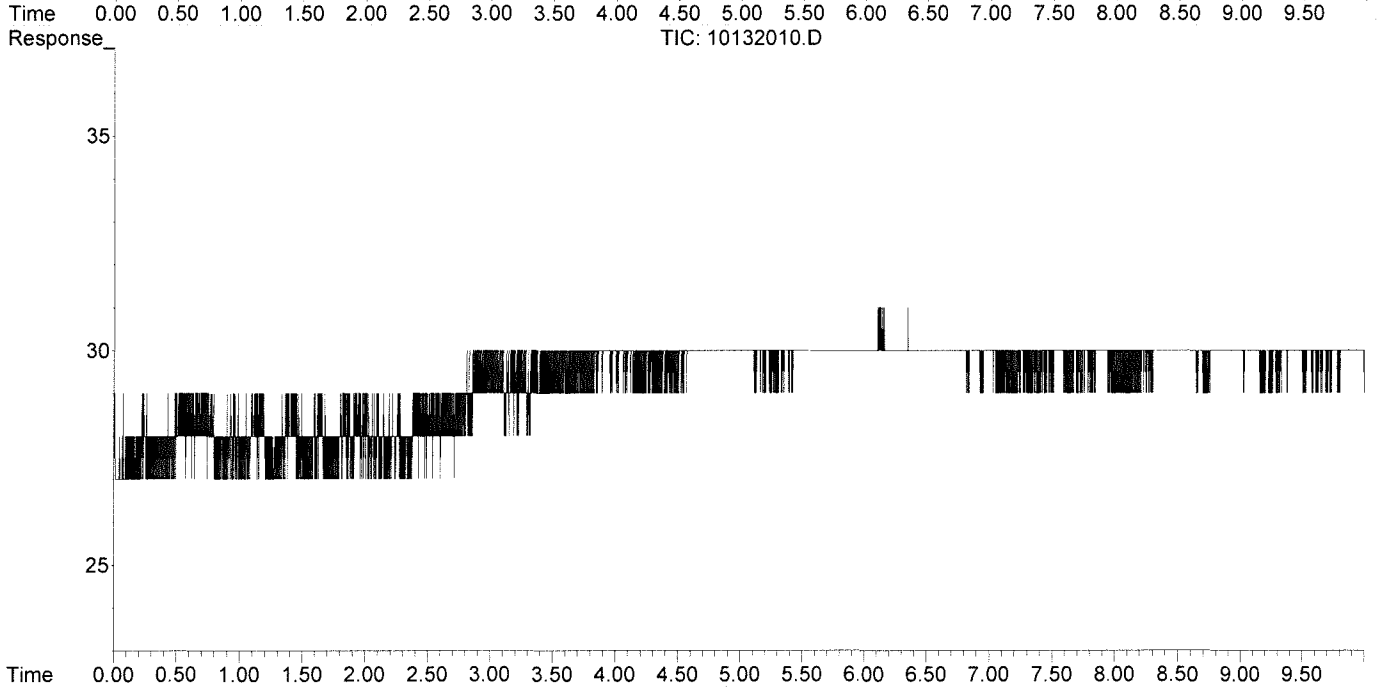
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132010.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 15:27:19
Operator : WH
Sample : P2005613-001ms 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 15:41:51 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132011.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 15:42:42
Operator : WH
Sample : P2005613-001msd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 15:53:30 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

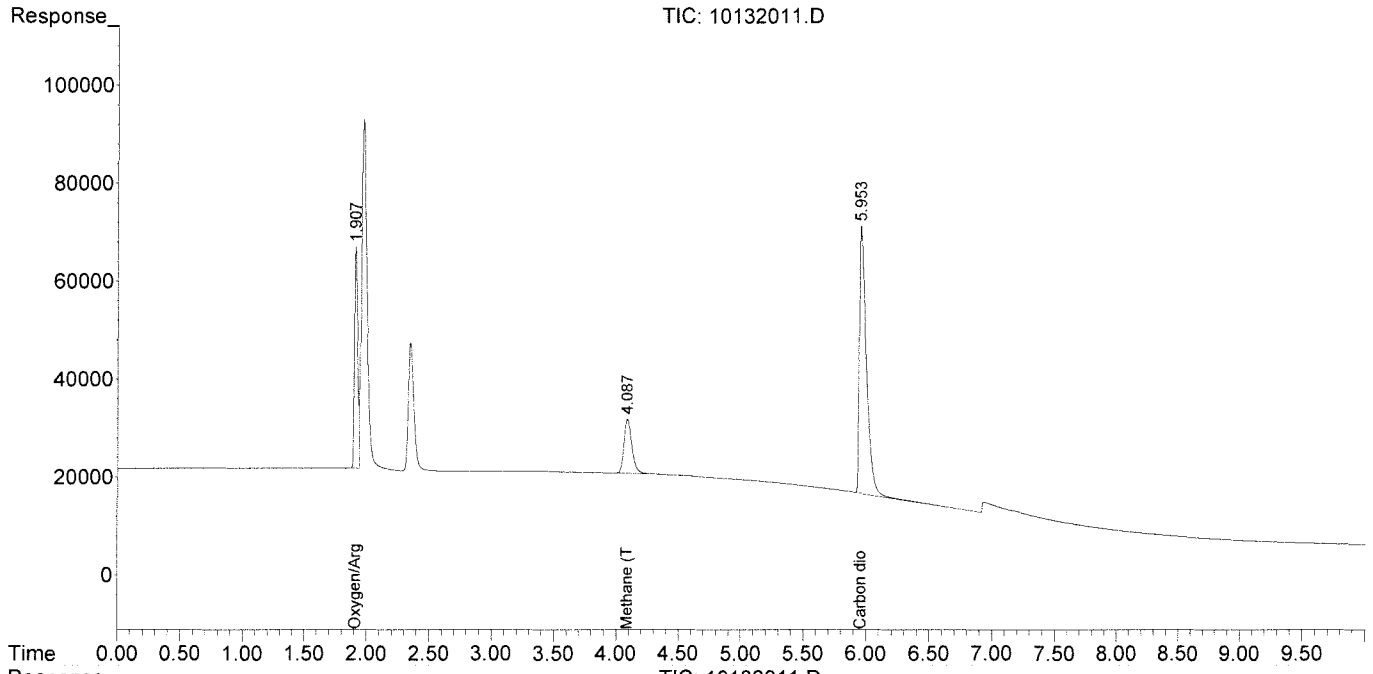
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.908f	781986	0.164	ppm
2)	Carbon monoxide	1.908f	781986	N.D.	ppm
3)	Methane (TCD)	4.088f	499592	52825.829	ppm
4)	Carbon dioxide	5.954	2124816	9052.203	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

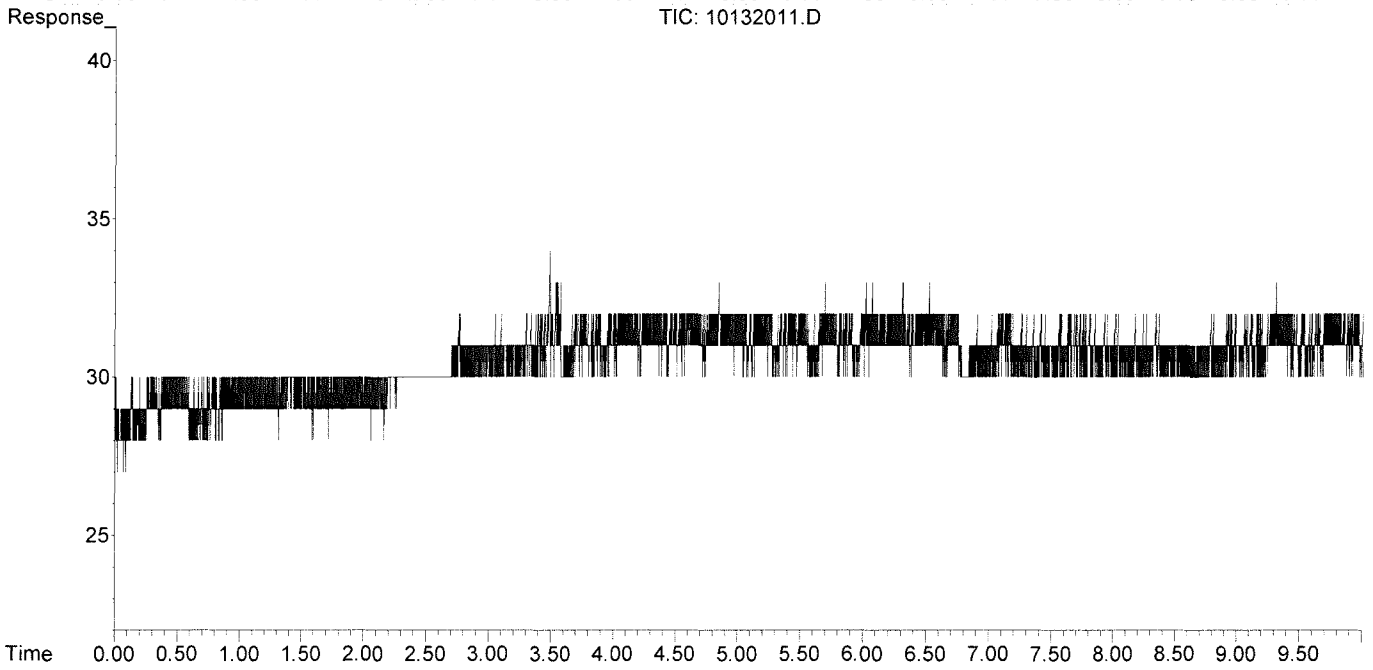
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132011.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 15:42:42
Operator : WH
Sample : P2005613-001msd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 15:53:30 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132004.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 13:22:16
Operator : WH
Sample : P2005613-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 13:37:43 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

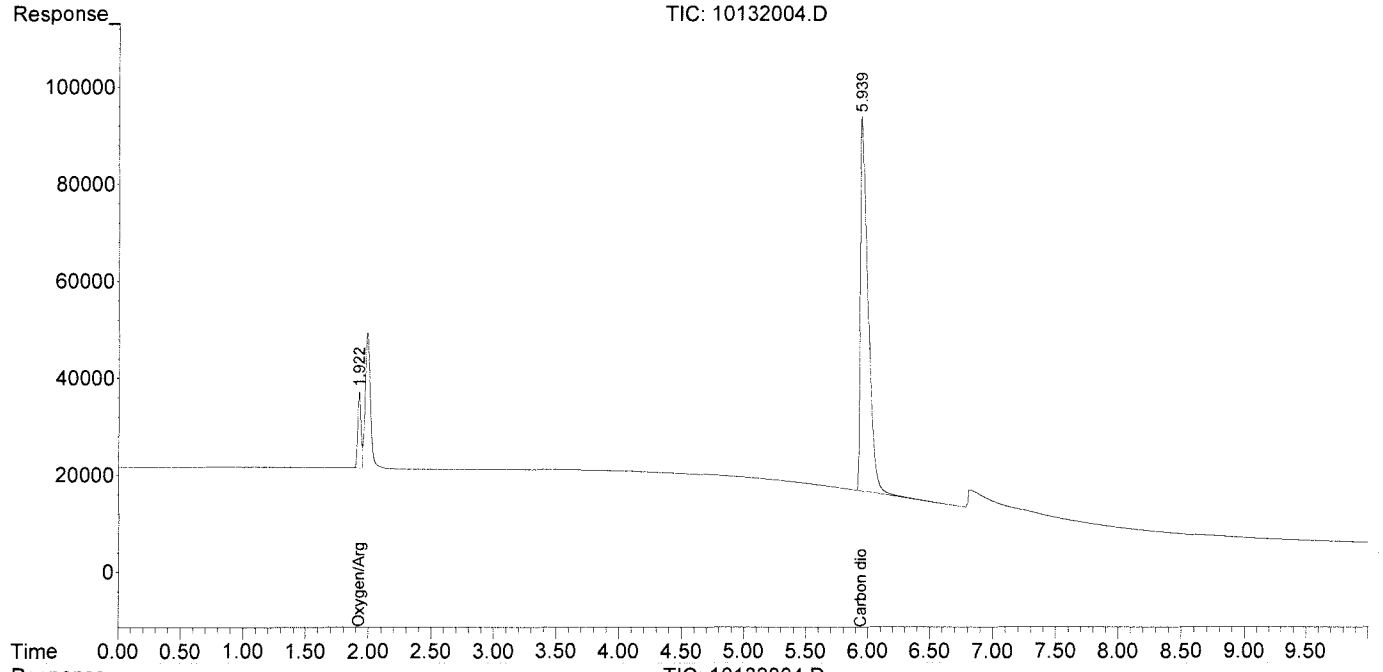
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.922f	285375	0.060	ppm
2)	Carbon monoxide	1.922f	285375	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.940	3322652	14155.258	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

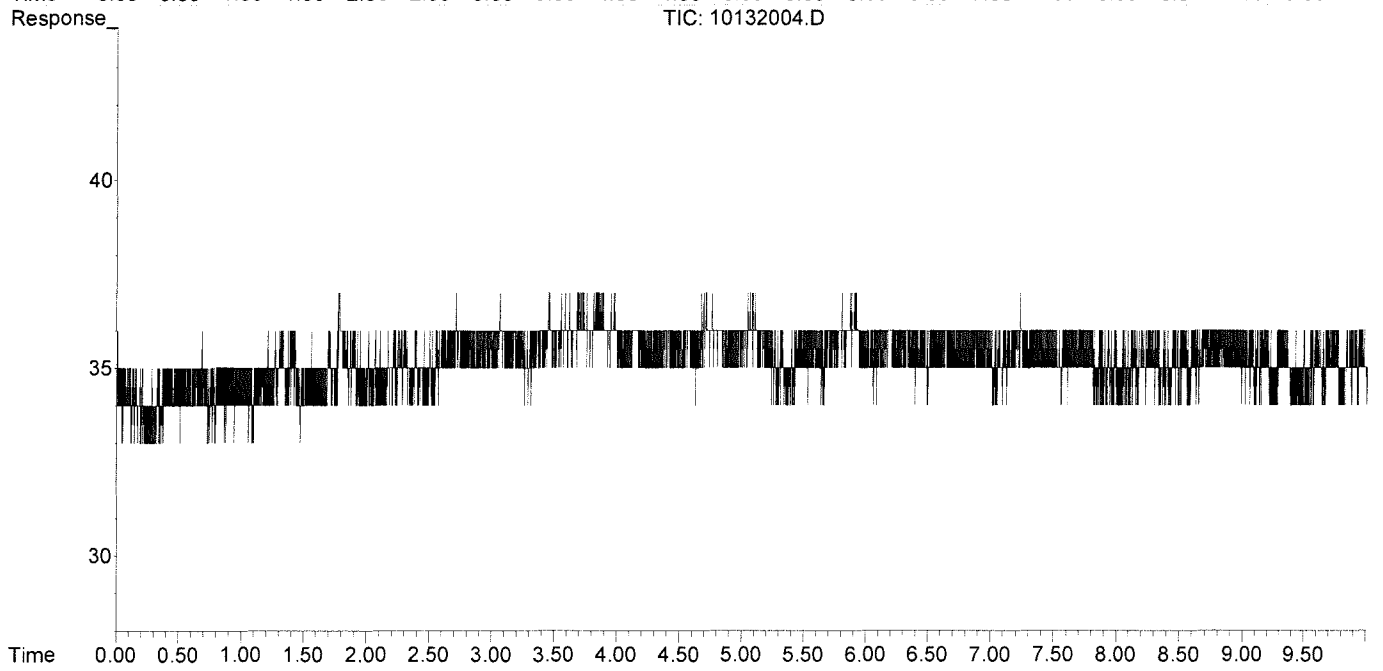
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132004.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 13:22:16
Operator : WH
Sample : P2005613-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 13:37:43 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132005.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 13:37:18
Operator : WH
Sample : P2005613-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 14:50:44 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

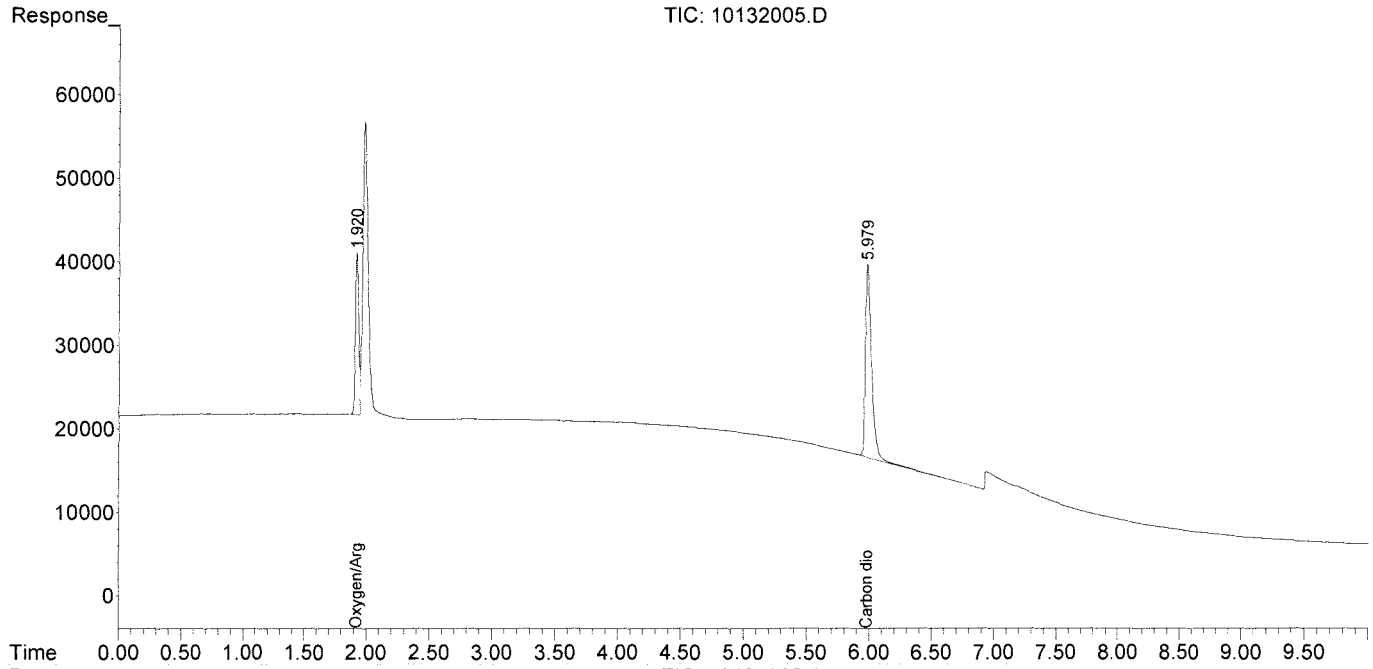
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.920f	347915	0.073	ppm
2)	Carbon monoxide	1.920f	347915	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.979	799693	3406.875	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

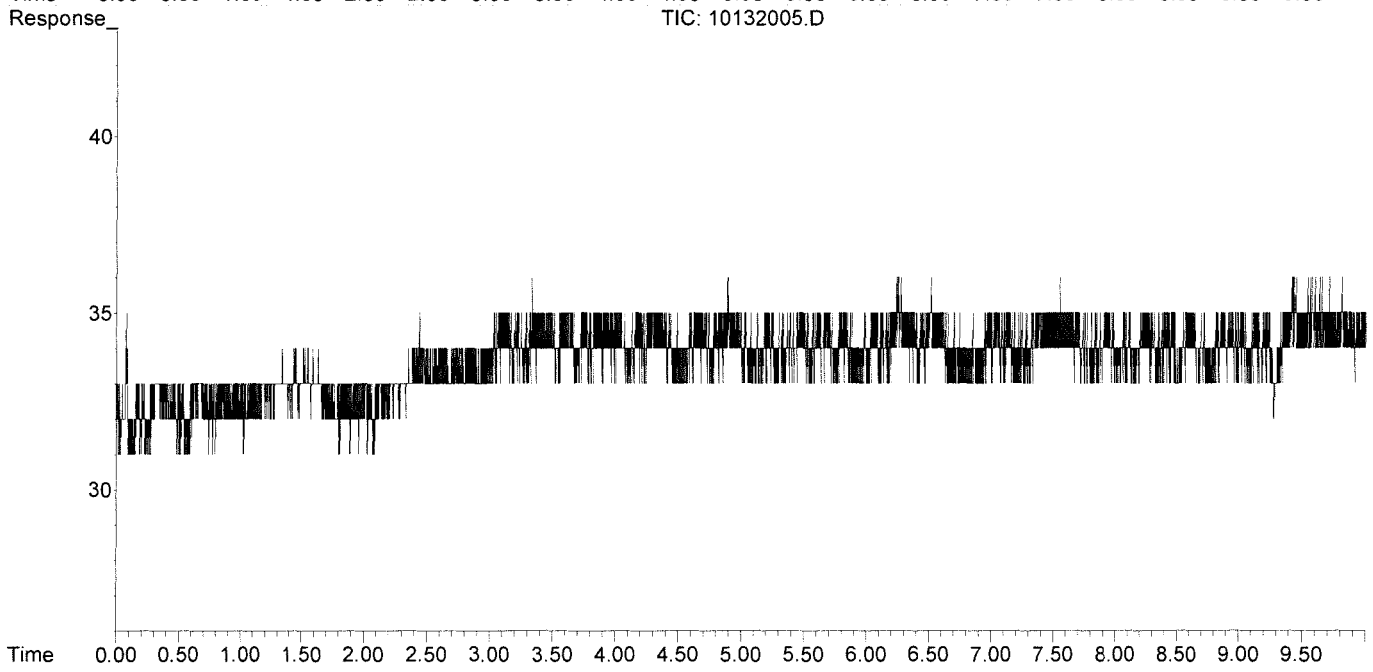
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132005.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 13:37:18
Operator : WH
Sample : P2005613-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 14:50:44 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132006.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 14:00:18
Operator : WH
Sample : P2005613-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 14:51:03 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

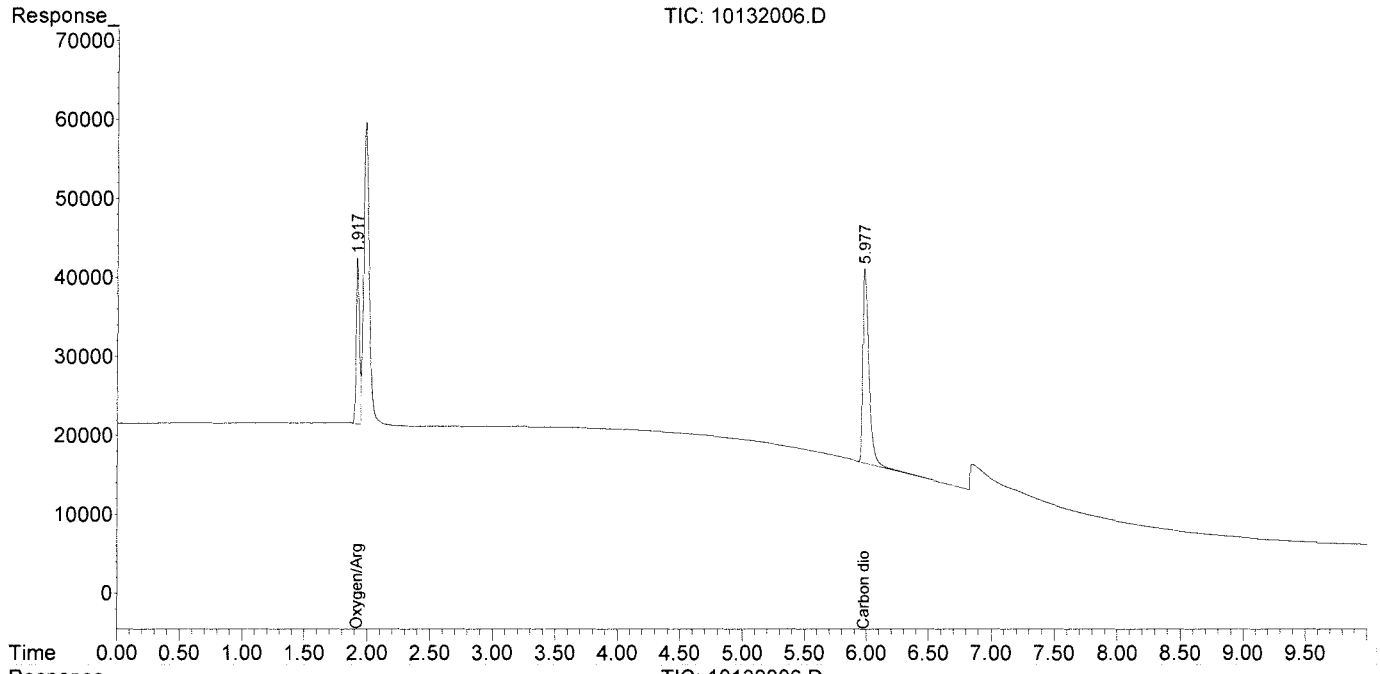
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.918f	376393	0.079	ppm
2)	Carbon monoxide	1.918f	376393	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.978	852843	3633.306	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

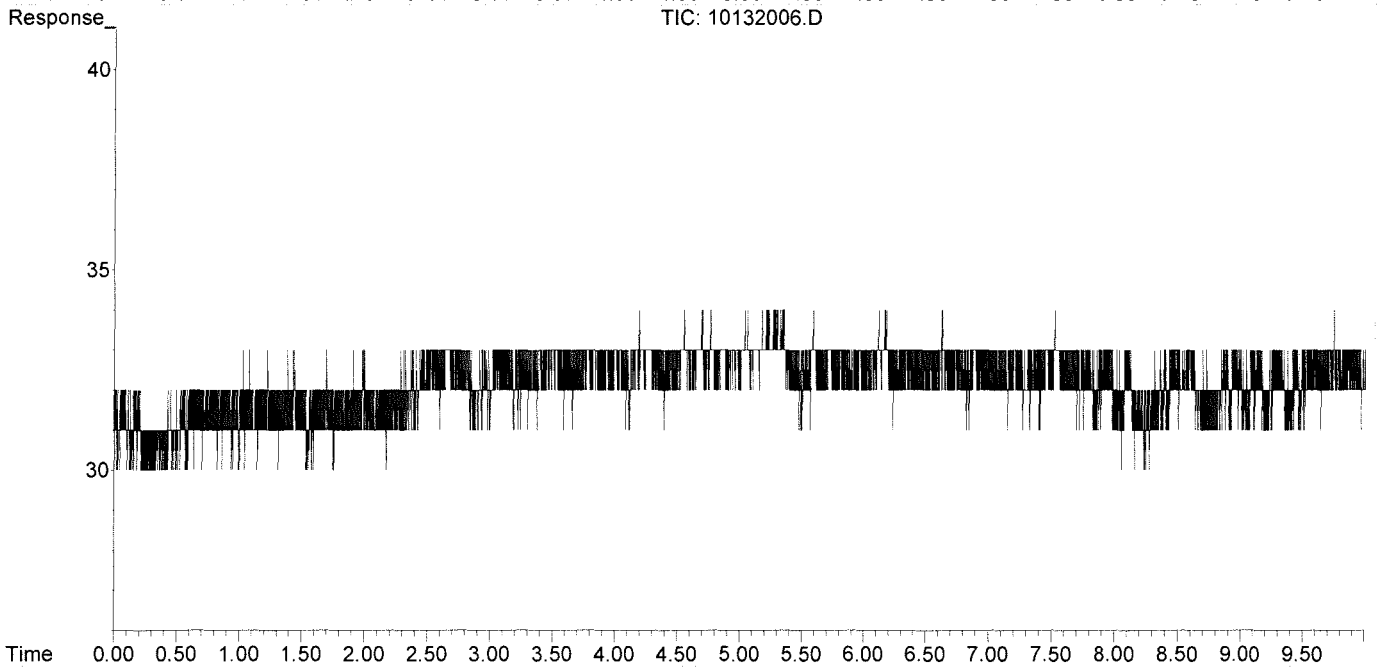
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132006.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 14:00:18
Operator : WH
Sample : P2005613-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 14:51:03 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132007.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 14:44:17
Operator : WH
Sample : P2005613-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 14:51:19 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

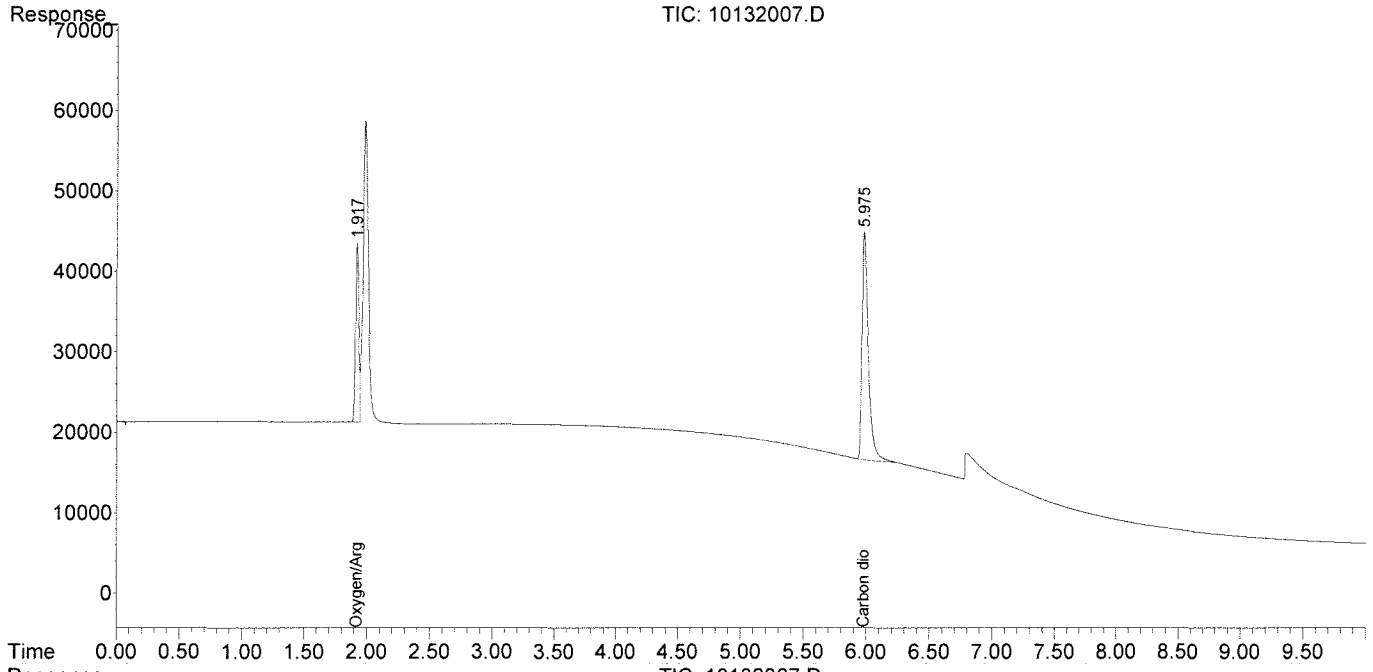
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.917f	399802	0.084	ppm	
2)	Carbon monoxide	1.917f	399802	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	5.975	1003744	4276.179	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

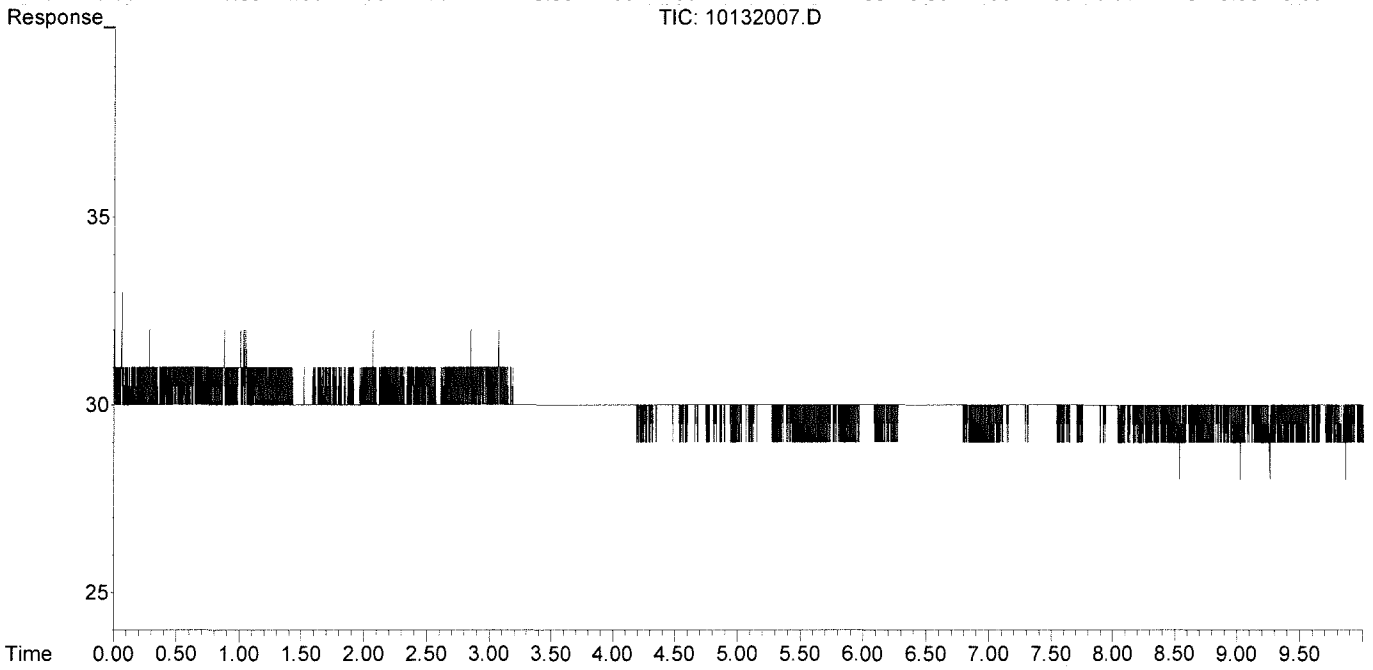
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132007.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 14:44:17
Operator : WH
Sample : P2005613-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 14:51:19 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

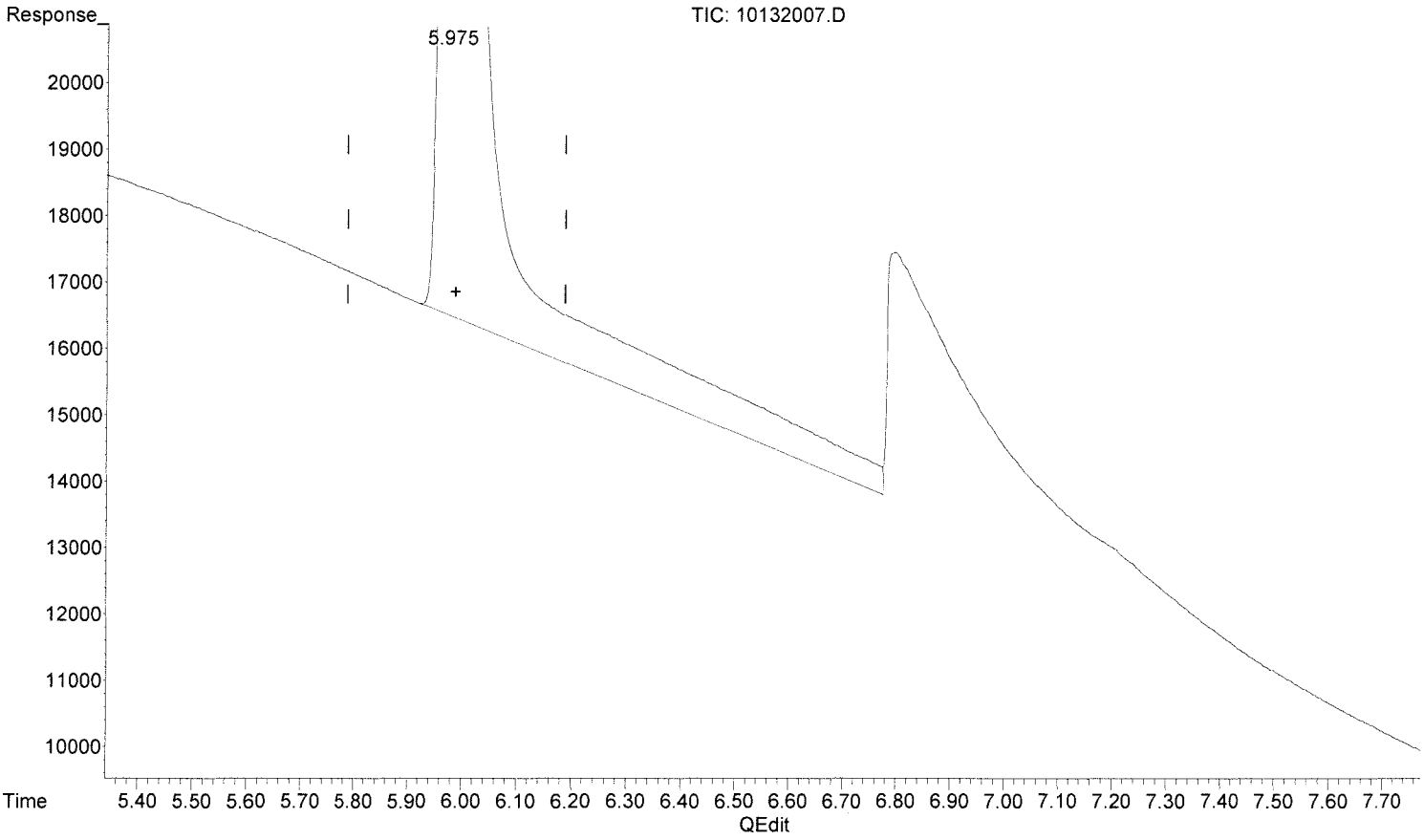




Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132007.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 14:44:17
Operator : WH
Sample : P2005613-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 14:51:19 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.976min 5300.943 ppm

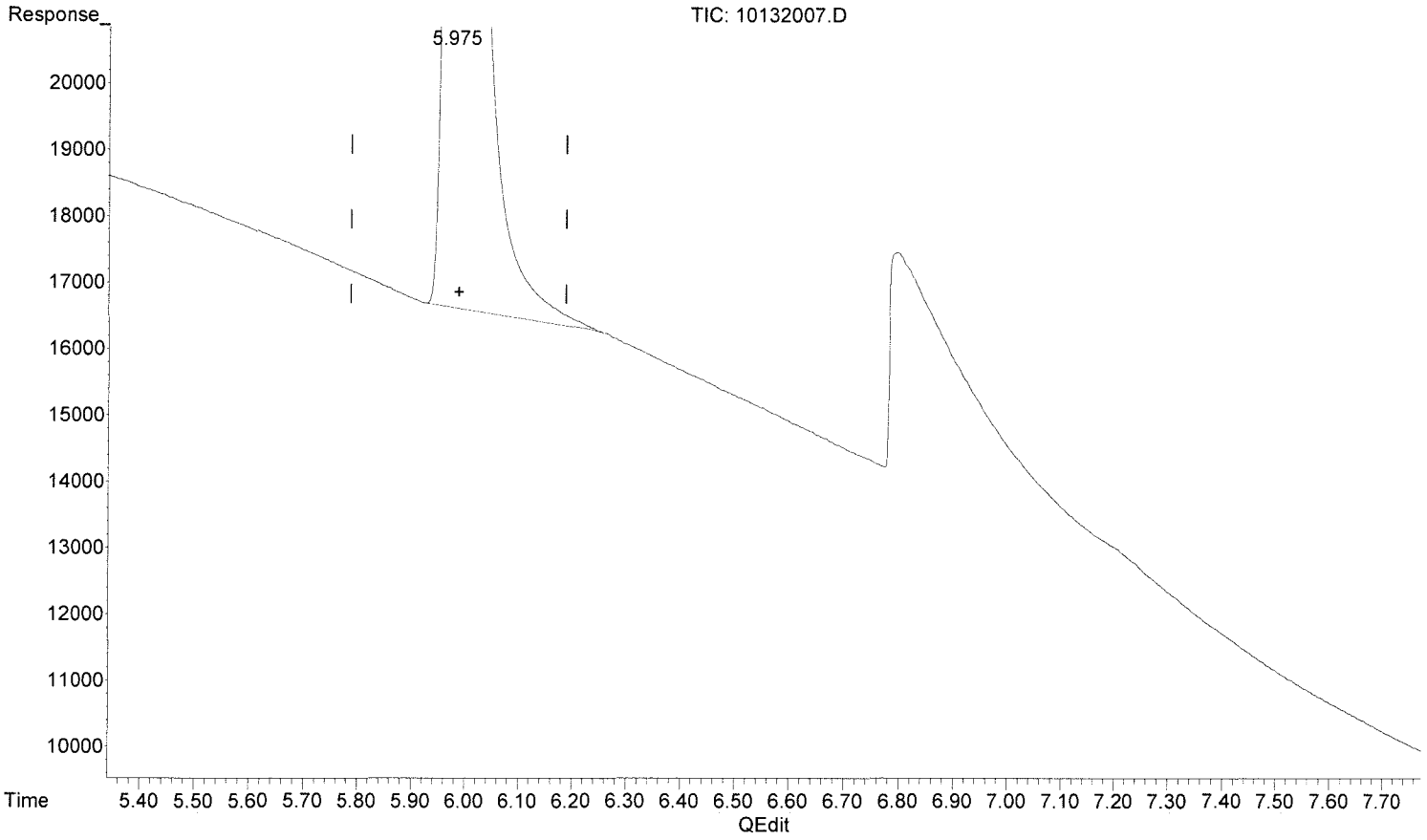
response 1244286

(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132007.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 14:44:17
Operator : WH
Sample : P2005613-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 14:51:19 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.975min 4276.179 ppm m

response 1003744

MR 10/14/20

10/14/20

(+) = Expected Retention Time

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132008.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 14:57:51
Operator : WH
Sample : P2005613-006 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 14:51:56 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

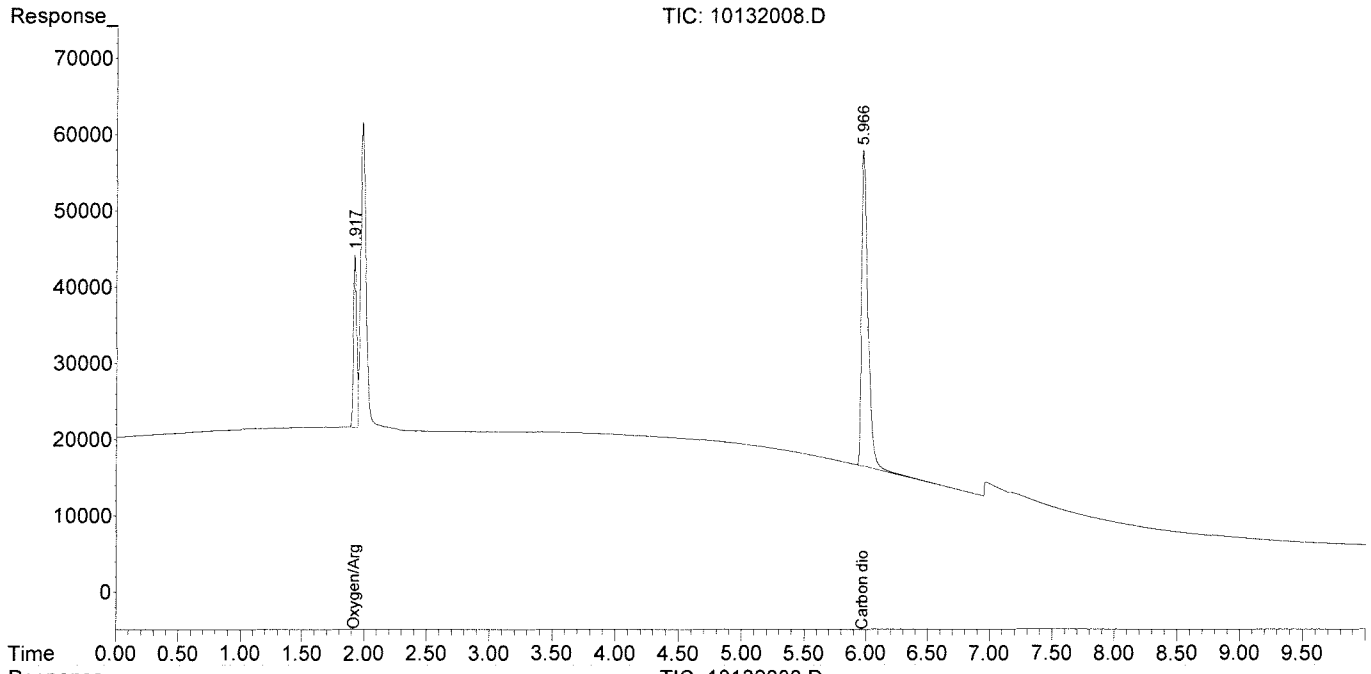
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.918f	402875	0.085	ppm
2)	Carbon monoxide	1.918f	402875	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.967	1500033	6390.483	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

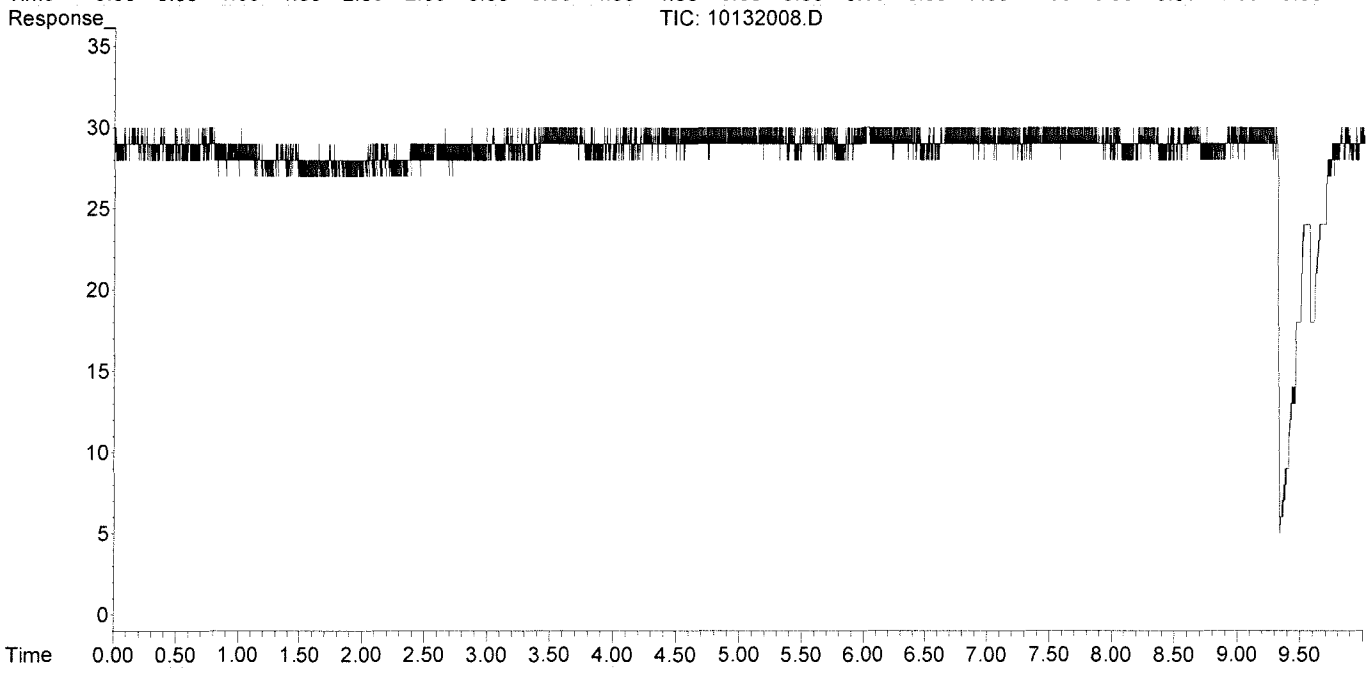
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132008.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 14:57:51
Operator : WH
Sample : P2005613-006 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 14:51:56 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132003.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 12:55:09
Operator : WH
Sample : mcs 01ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 13:21:10 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

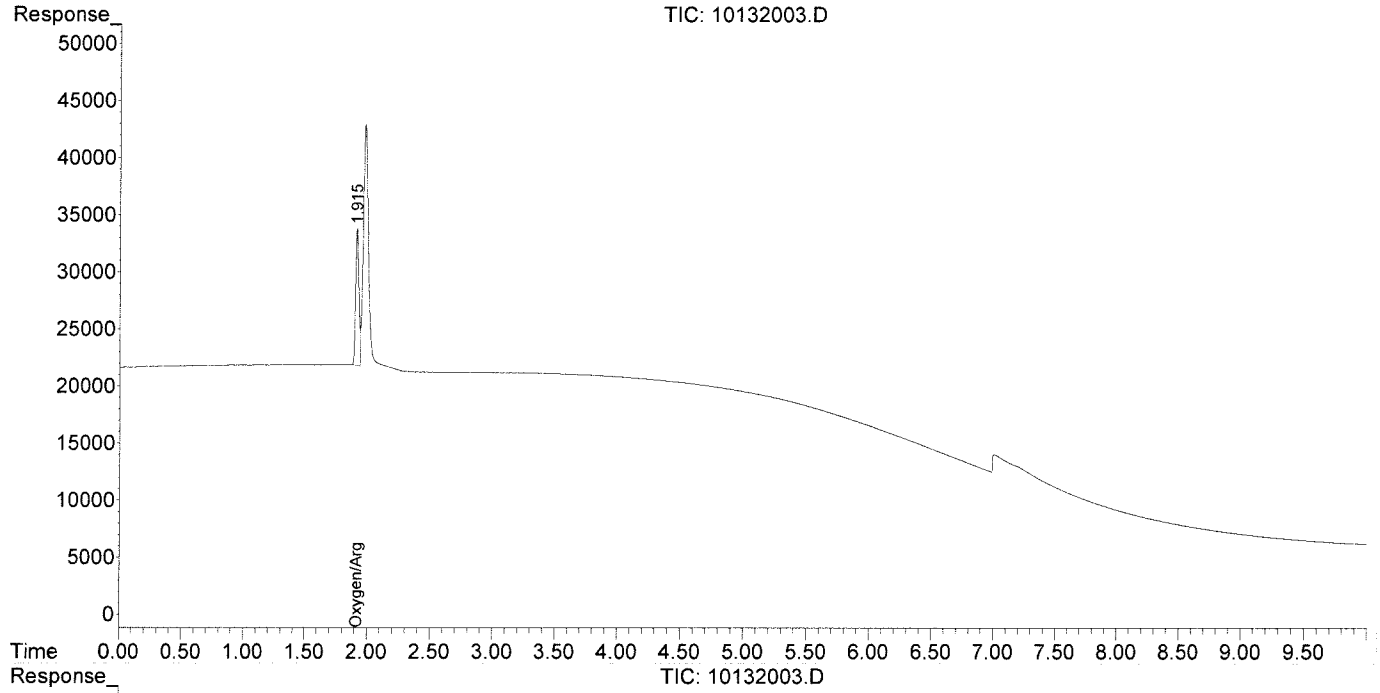
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.916f	217604	0.046	ppm
2)	Carbon monoxide	1.916f	217604	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

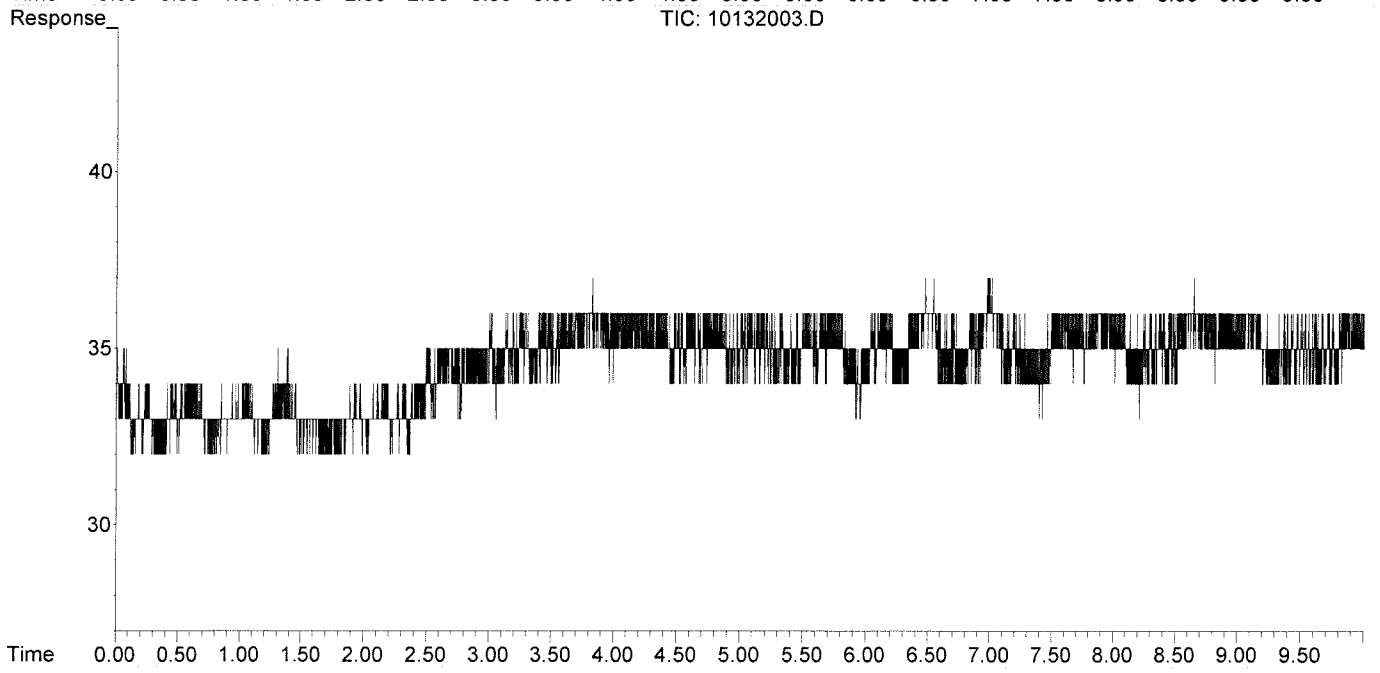
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132003.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 12:55:09
Operator : WH
Sample : mcs 01ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 13:21:10 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132012.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 15:56:01
Operator : WH
Sample : tcd lcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 16:08:23 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

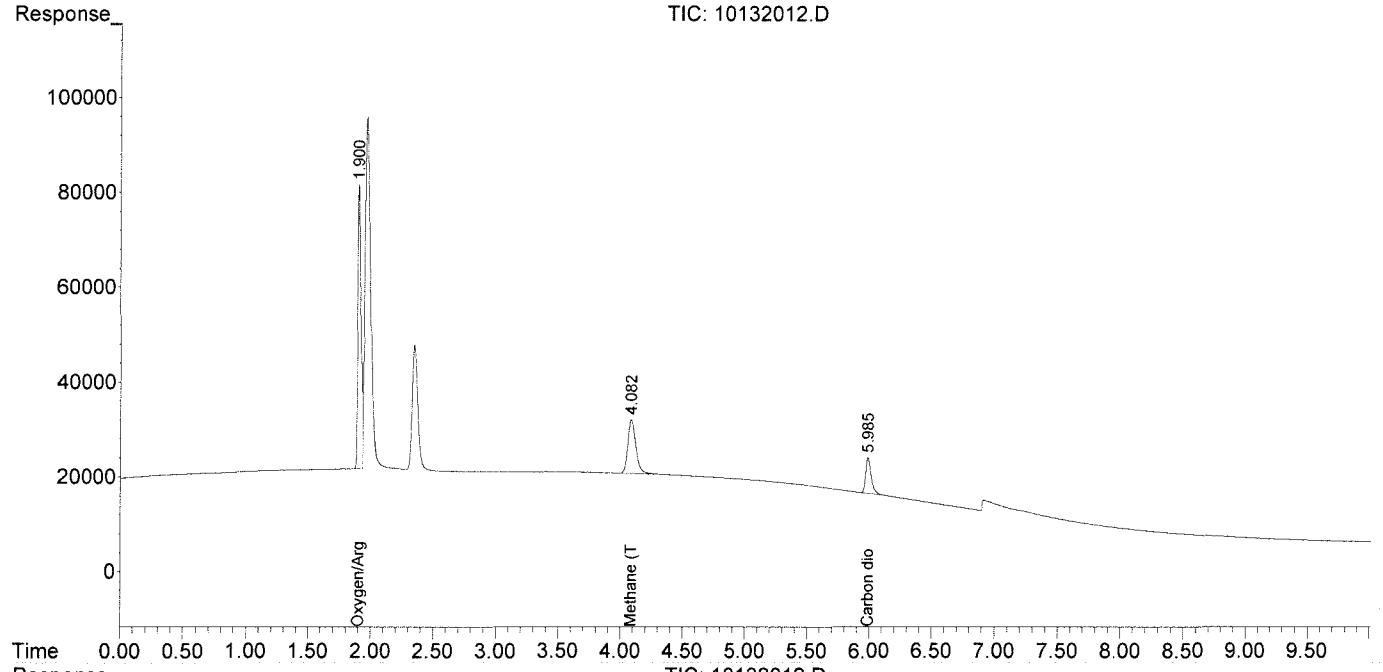
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.901	1067362	0.224	ppm	
2)	Carbon monoxide	1.901	1067362	N.D.	ppm	
3)	Methane (TCD)	4.083f	515896	54549.690	ppm	
4)	Carbon dioxide	5.985	233596	995.171	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

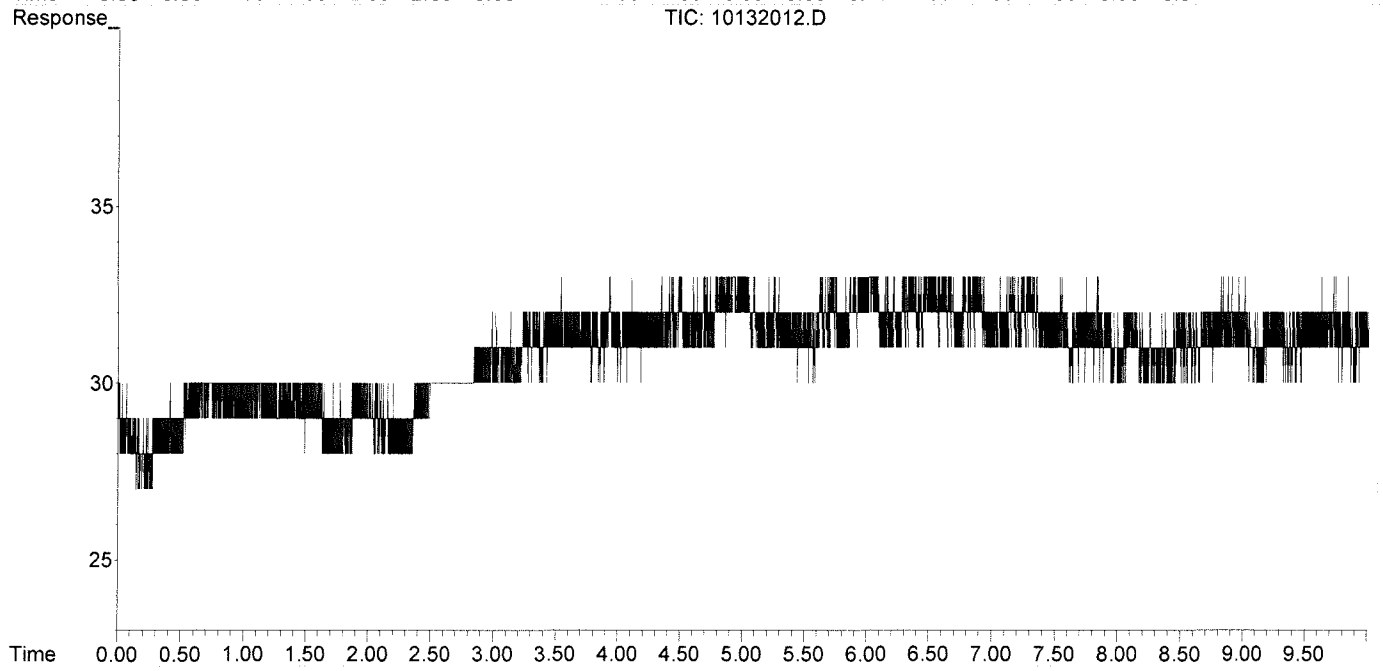
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132012.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 15:56:01
Operator : WH
Sample : tcd lcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 16:08:23 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

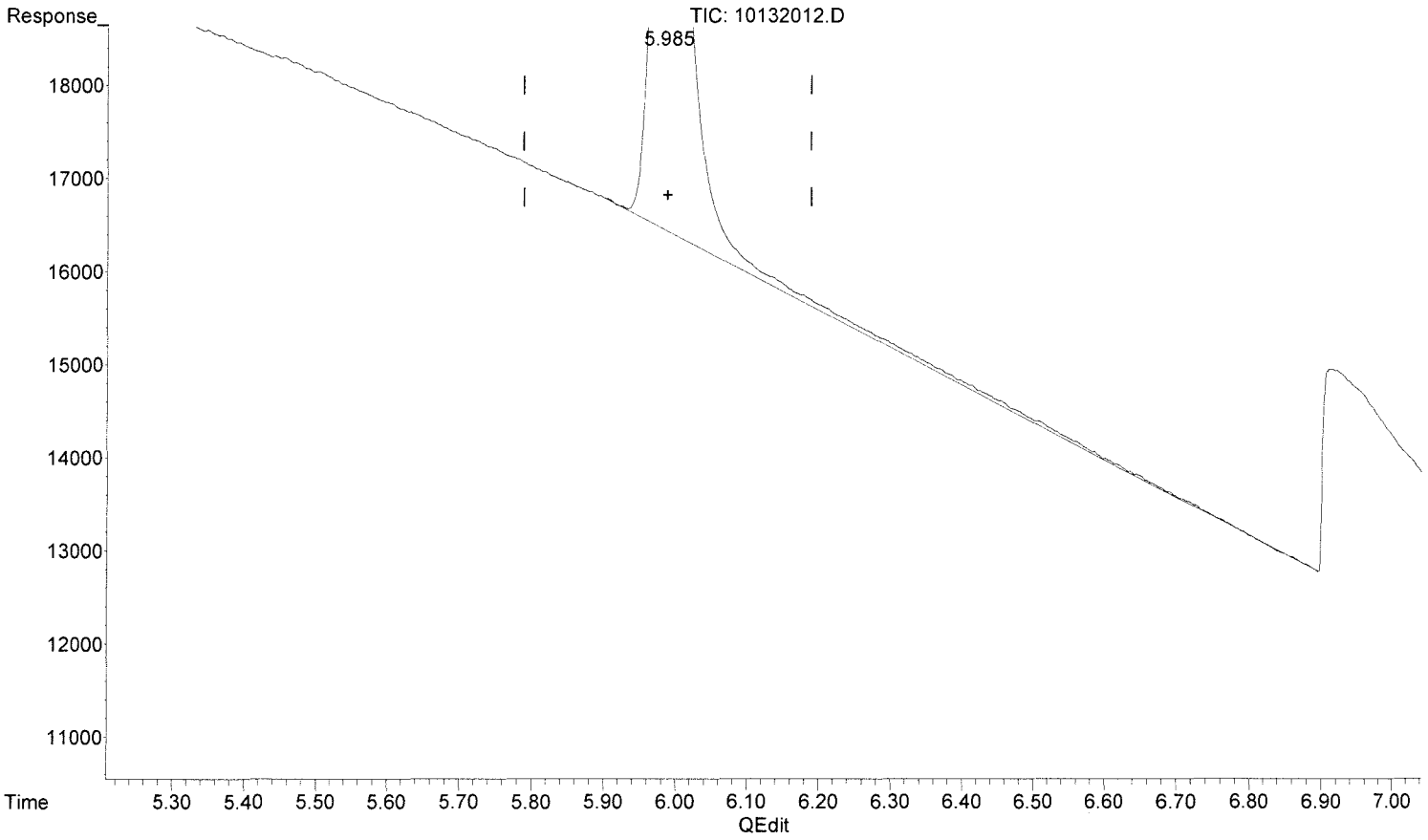




Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132012.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 15:56:01
Operator : WH
Sample : tcd lcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 16:08:23 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.985min 1086.572 ppm

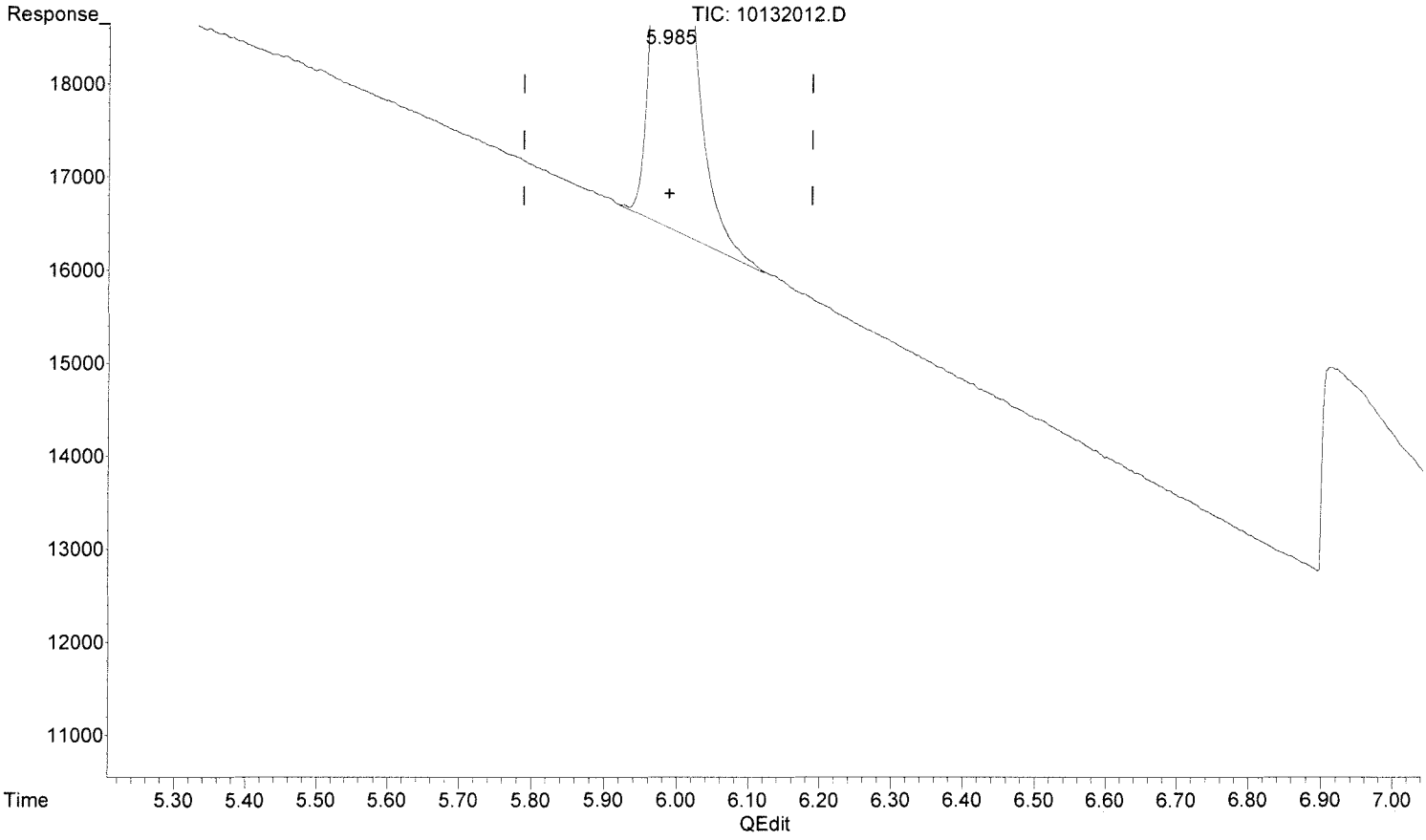
response 255050

(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132012.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 15:56:01
Operator : WH
Sample : tcd lcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 16:08:23 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.985min 995.171 ppm m

response 233596

MR 10/14/20

(+) = Expected Retention Time

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132013.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 16:09:44
Operator : WH
Sample : tcd lcsd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 16:32:34 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

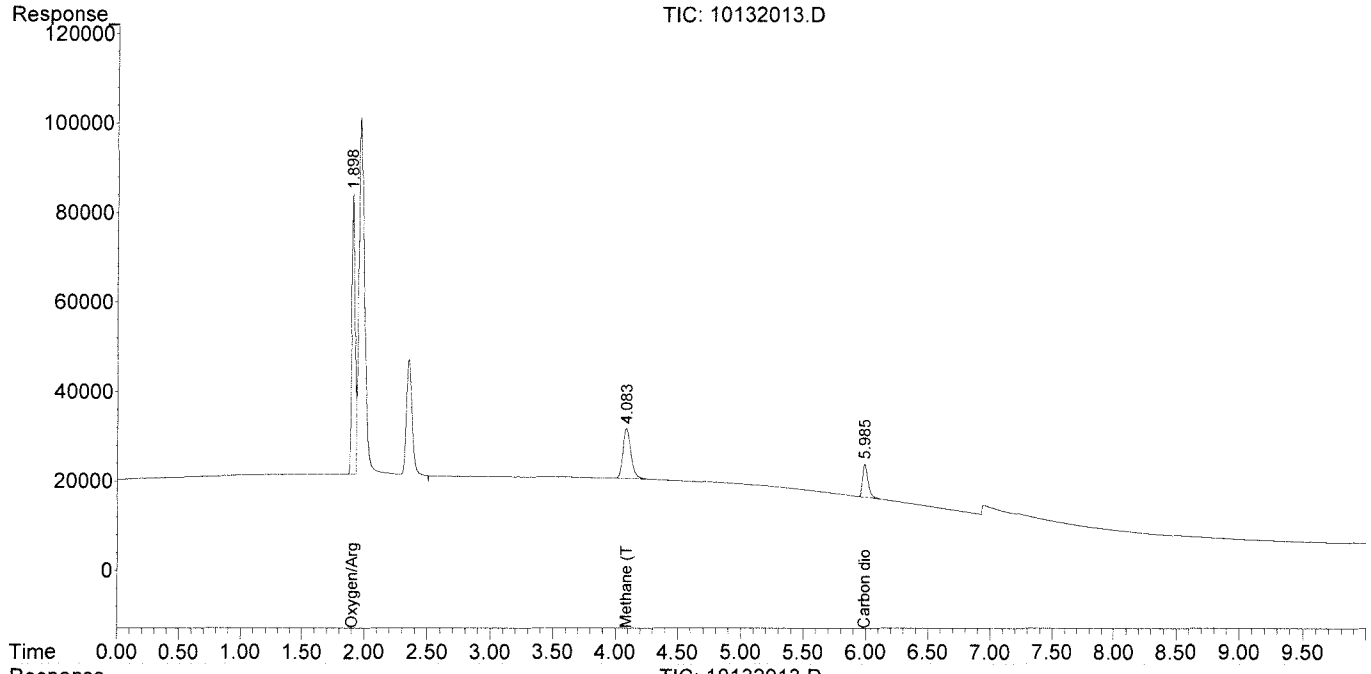
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.899	1104471	0.232	ppm	
2)	Carbon monoxide	1.899	1104471	N.D.	ppm	
3)	Methane (TCD)	4.084f	506642	53571.266	ppm	
4)	Carbon dioxide	5.985	228991	975.556	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

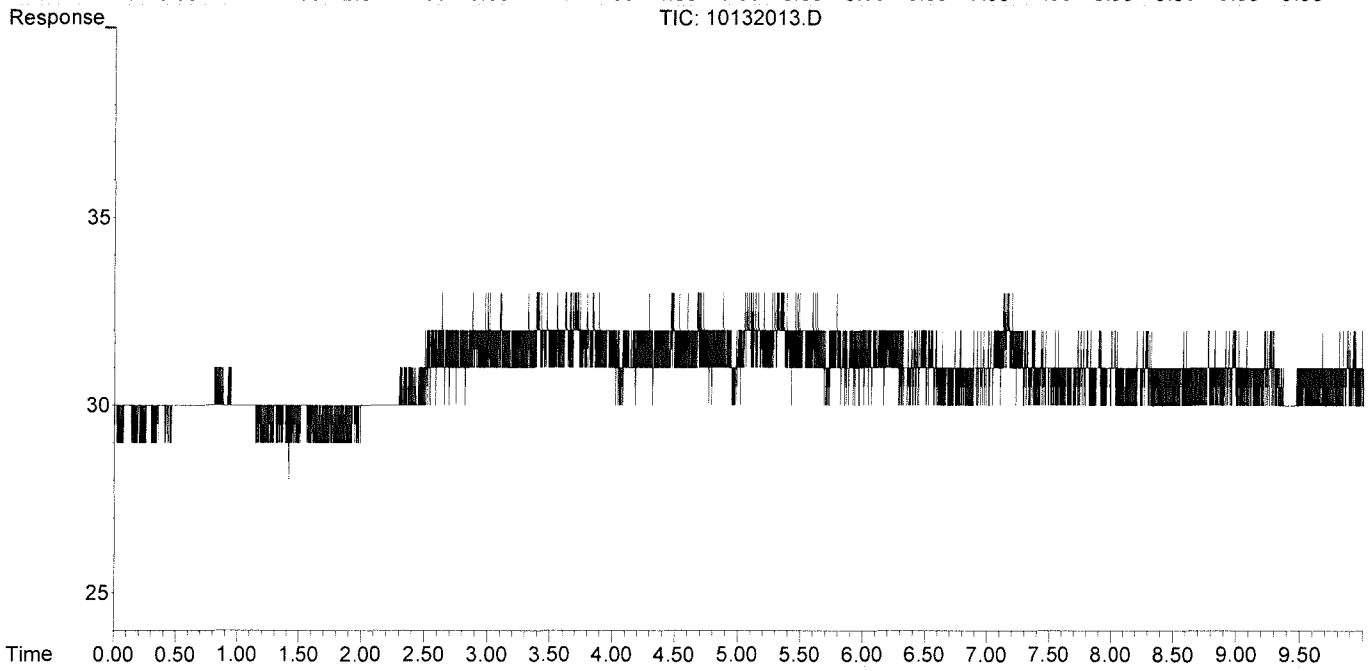
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132013.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 16:09:44
Operator : WH
Sample : tcd lcsd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 16:32:34 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

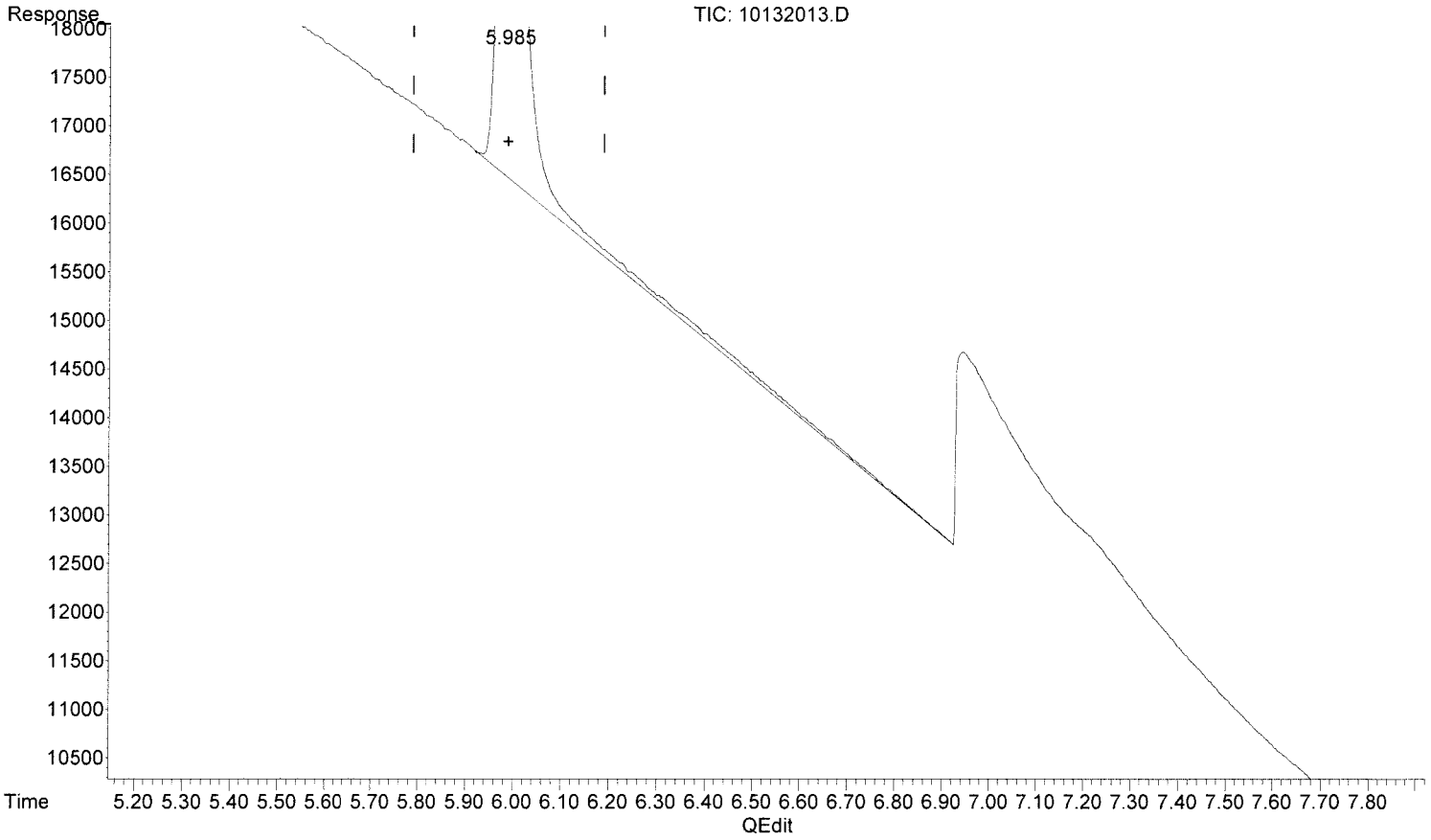




Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132013.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 16:09:44
Operator : WH
Sample : tcd lcsd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 16:32:34 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.986min 1081.359 ppm

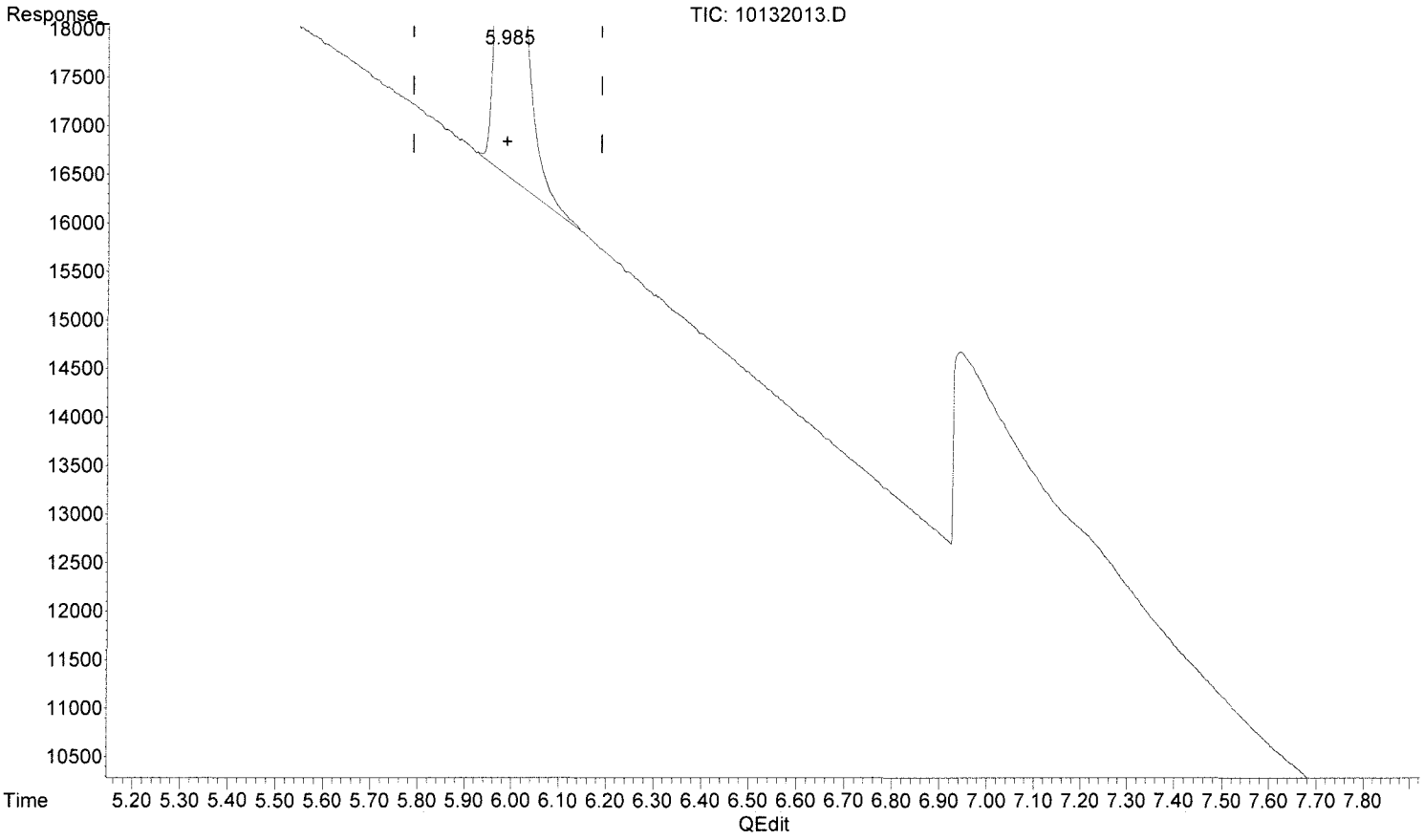
response 253826

(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132013.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 16:09:44
Operator : WH
Sample : tcd lcsd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 16:32:34 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.985min 975.556 ppm m

response 228991

MR 10/14/20

(+) = Expected Retention Time

Response Factor Report HP5890

Method Path : I:\GC10\METHODS\
Method File : RS082817_CO2.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Tue Aug 29 16:13:13 2017
Response Via : Initial Calibration

Calibration Files
1 =08291715.D 2 =08291716.D 3 =08291717.D
4 =08291719.D 5 =08291720.D 6 =08291721.D

	Compound	1	2	3	4	5	6	Avg		%RSD
1)	Oxygen/Argon	4.760						4.760	E6	0.00
2)	Carbon monoxide	2.775		1.066	0.043	0.033	0.027	0.657	E6	170.12
3)	Methane (TCD)							9.457		0.00
4)	Carbon dioxide	2.717	2.193	2.338	2.272	2.265	2.298	2.347	E2	7.99

Signal #2 Calibration Files
1 =08291715.D 2 =08291716.D 3 =08291717.D
4 =08291719.D 5 =08291720.D 6 =08291721.D

	Compound	1	2	3	4	5	6	Avg		%RSD
6)	Methane (FID)	1.253	1.160	1.005	0.927	0.848	0.848	0.945	E4	15.85
7)	Ethylene	1.677	1.605	1.900	1.749	1.597	1.579	1.684	E4	7.30
8)	Ethane	1.769	1.631	1.866	1.767	1.639	1.667	1.723	E4	5.40
9)	Propylene	2.402	2.309	2.767	2.551	2.331	2.333	2.449	E4	7.32
10)	Propane	2.906	2.737	2.817	2.639	2.410	2.420	2.655	E4	7.75
11)	Isobutylene							0.000		-1.00
12)	Isobutane							0.000		-1.00
13)	n-Butane							0.000		-1.00

(#) = Out of Range ### Number of calibration levels exceeded format ###

RS082817_CO2.M Wed Aug 30 13:24:19 2017

Calibration Status Report HP5890

Method Path : I:\GC10\METHODS\
Method File : RS082817_CO2.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Tue Aug 29 16:13:13 2017
Response Via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	1	0	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291715.D
2	2	0	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291716.D
3	3	3	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291717.D
4	4	10	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291719.D
5	5	25	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291720.D
6	6	125	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291721.D
7	7	5000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241708.D
8	8	25000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241709.D
9	9	2000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241710.D
10	10	30000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241711.D

#	ID	Update Time	Quant Time	Acquisition Time
1	1	Aug 29 14:21 2017	Aug 29 14:20 2017	29-Aug-2017, 14:07
2	2	Aug 29 14:52 2017	Aug 29 14:51 2017	29-Aug-2017, 14:22
3	3	Aug 29 15:04 2017	Aug 29 15:04 2017	29-Aug-2017, 14:53
4	4	Aug 29 15:36 2017	Aug 29 15:36 2017	29-Aug-2017, 15:23
5	5	Aug 29 15:57 2017	Aug 29 15:57 2017	29-Aug-2017, 15:44
6	6	Aug 29 16:13 2017	Aug 29 16:13 2017	29-Aug-2017, 16:00
7	7	Aug 25 09:05 2017	Aug 24 16:00 2017	24-Aug-2017, 15:44
8	8	Aug 25 09:06 2017	Aug 24 16:13 2017	24-Aug-2017, 16:02
9	9	Aug 25 09:06 2017	Aug 24 16:31 2017	24-Aug-2017, 16:16
10	10	Aug 25 09:07 2017	Aug 24 16:42 2017	24-Aug-2017, 16:33

RS082817_CO2.M Wed Aug 30 13:24:30 2017

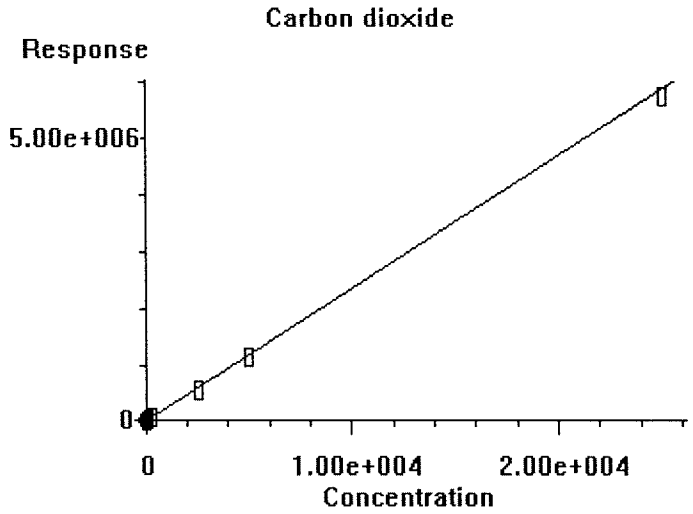
dit Compounds -- Compound #4 -- Carbon dioxide

Search by: Ret Time | Name | Index | Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response	Lvl ID	Concentration	Response
1	25.000000	6793.665186			
2	100.000000	21932.418000			
3	250.000000	58460.642510			
4	2500.000000	568043.388750			
5	5000.000000	1132363.215937			
6	25000.000000	5744294.891563			
7	25000.000000				
8	25000.000000				
9	2000.000000				
10	30000.000000				



0.000e+000	Quadratic term
2.347e+002	Linear term
0.000e+000	Constant term
7.987%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:07
Operator : MC
Sample : 25ppm s32-08291701 0.25ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:20:06 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

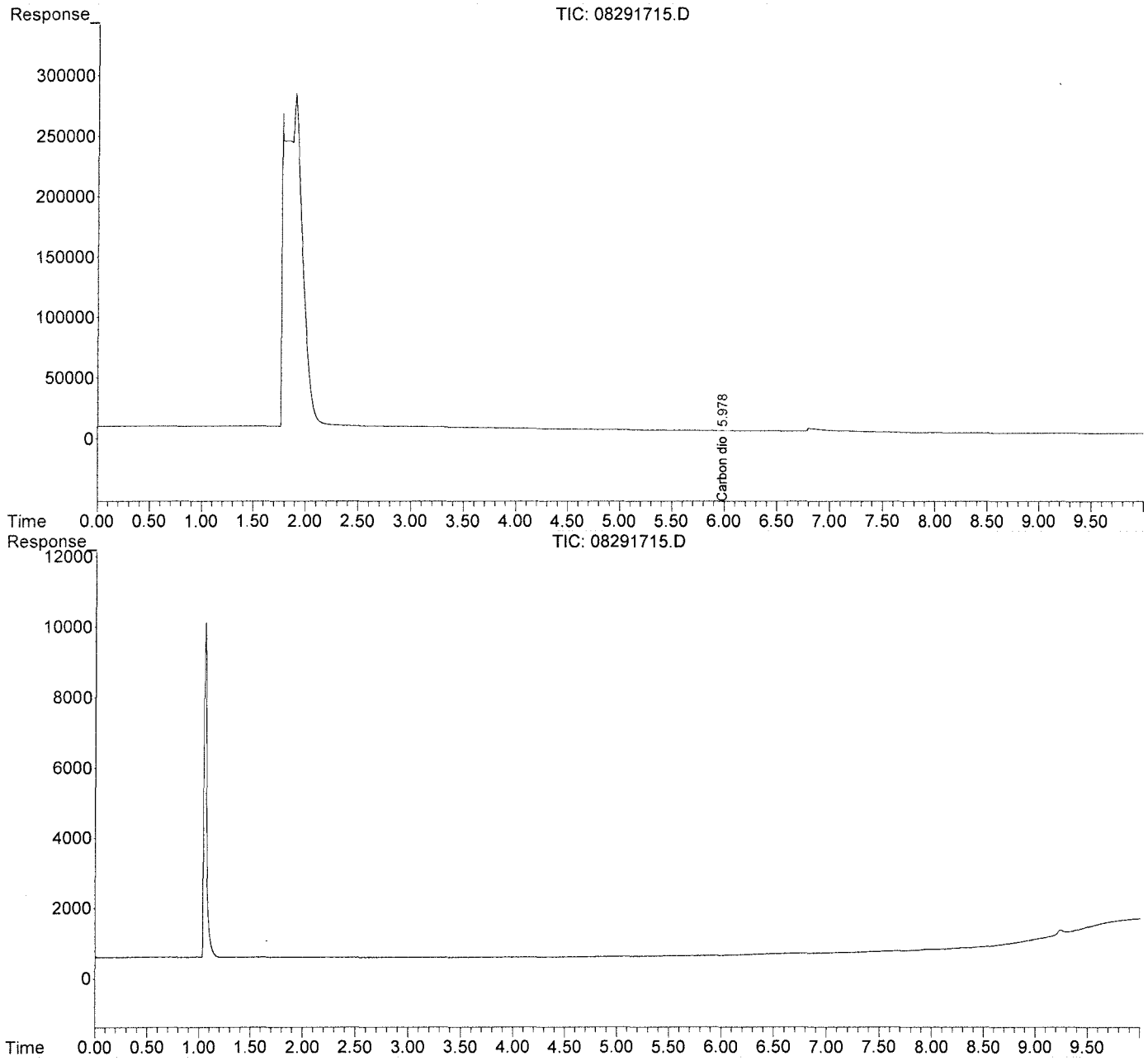
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.776	277465	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	5.978	6794	27.870	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:07
Operator : MC
Sample : 25ppm s32-08291701 0.25ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:20:06 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

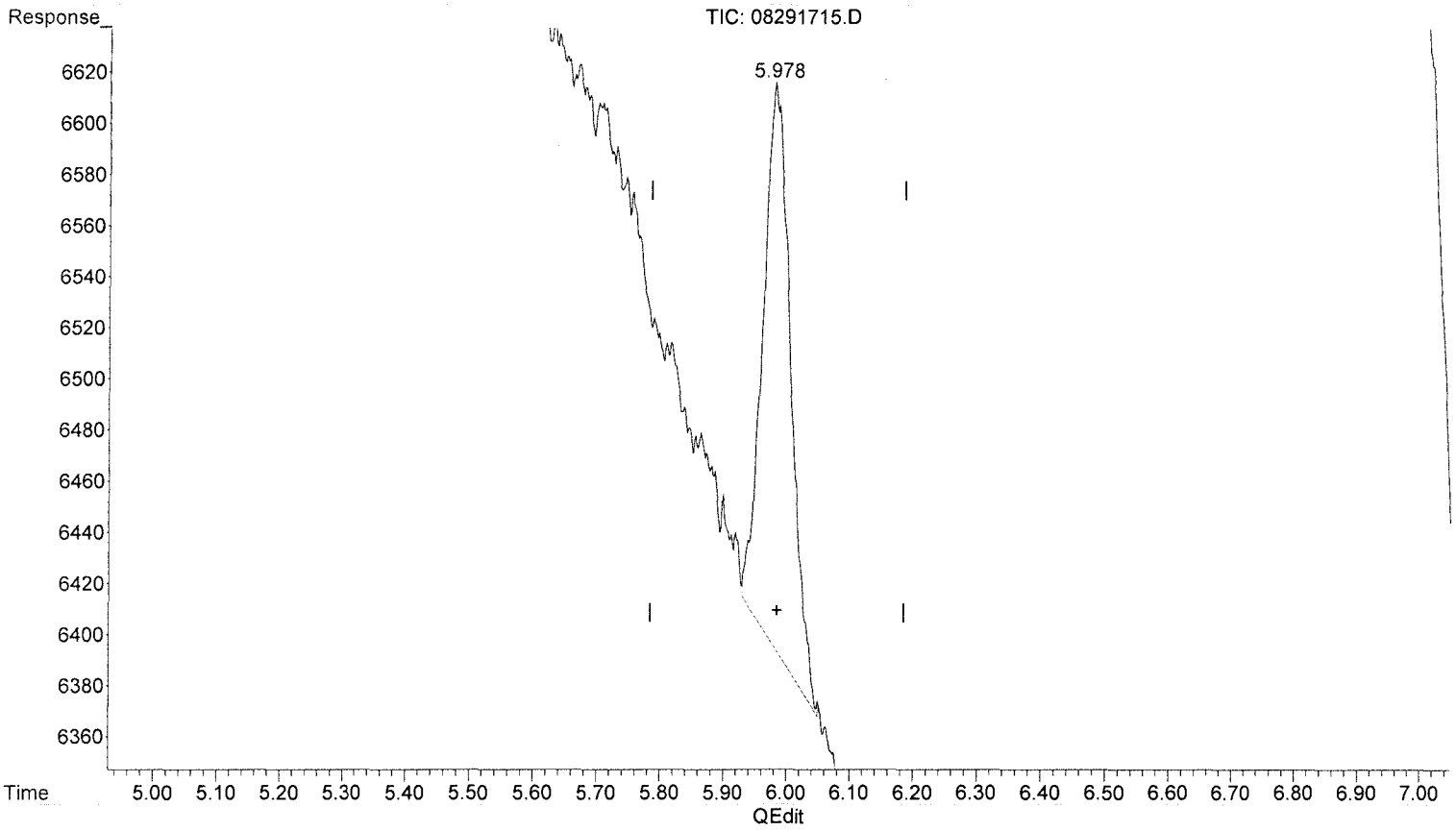


01078906

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:07
Operator : MC
Sample : 25ppm s32-08291701 0.25ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:20:06 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.978min 27.870 ppm m

response 6794

M 9/30/17
BLW
M.
per MW

M 9/4/17

(+) = Expected Retention Time

RS082817_CO2.M Wed Aug 30 13:17:47 2017

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291716.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:22
Operator : MC
Sample : 100ppm s32-08291702 0.2ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:51:38 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:21:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

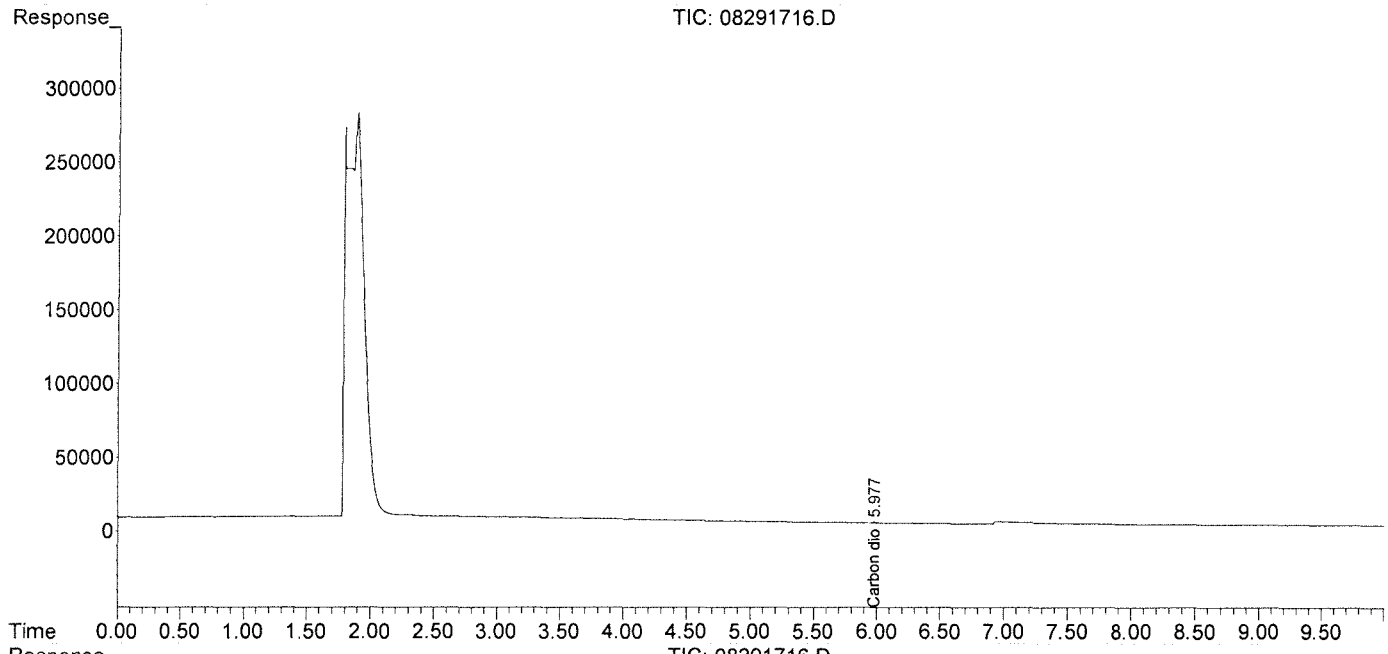
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.790	-598962	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	d
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	5.978	21932	87.858	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

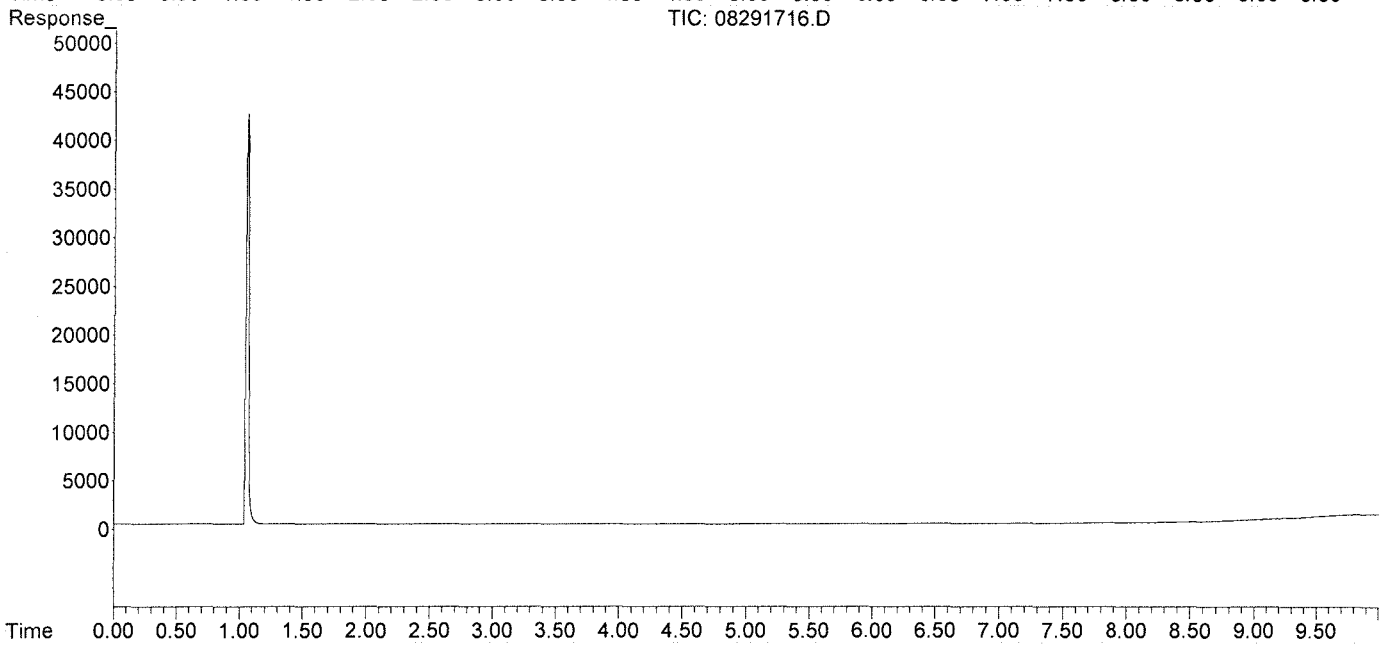
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291716.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:22
Operator : MC
Sample : 100ppm s32-08291702 0.2ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:51:38 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:21:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

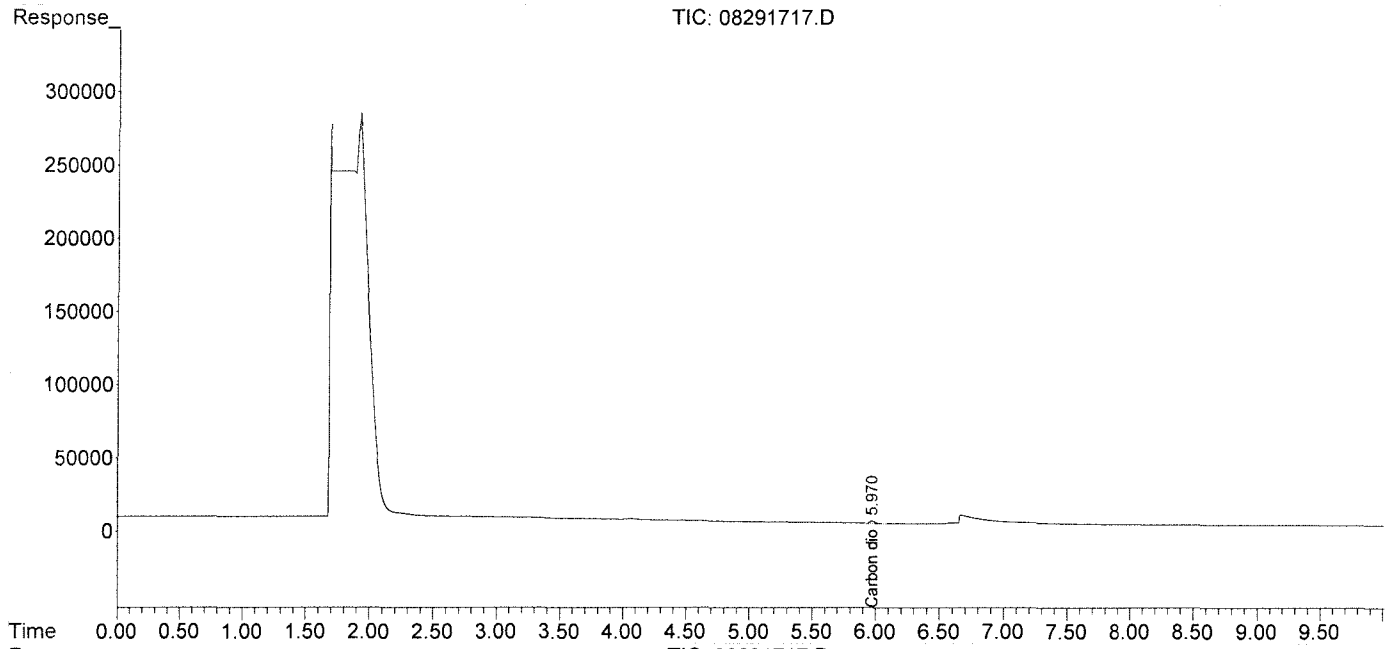
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.920f	-30716454	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	d
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.970	58461	240.204	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

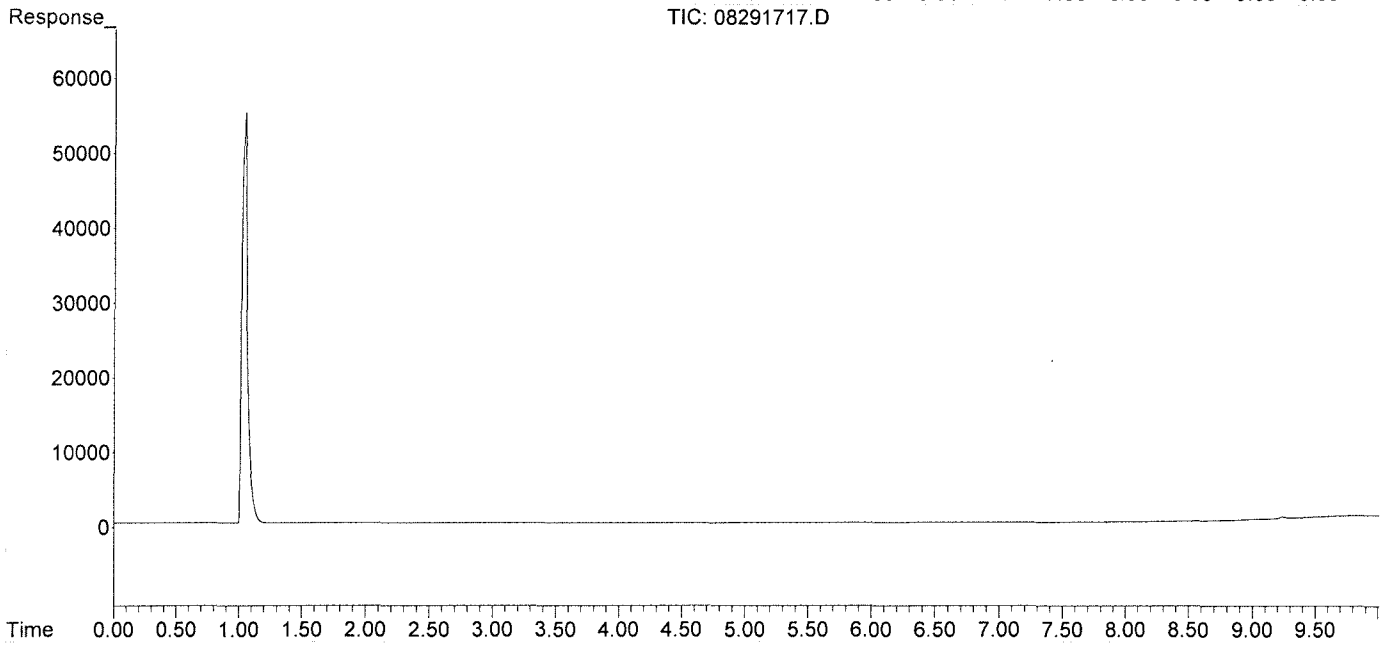
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

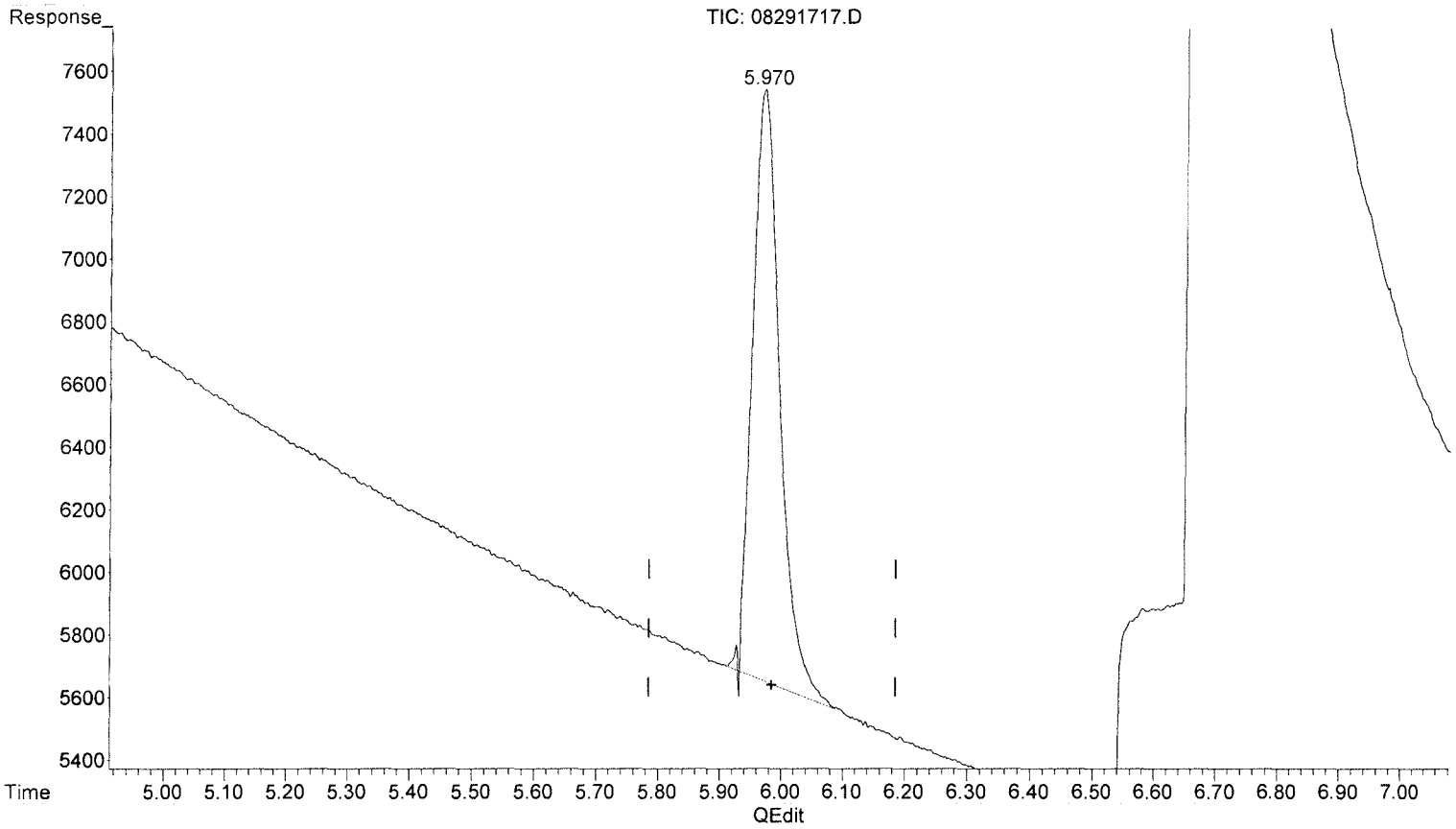




Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.970min 240.204 ppm m

response 58461

(+) = Expected Retention Time

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291719.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:23
Operator : MC
Sample : 2500ppm s32-08231701 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:35:50 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:04:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

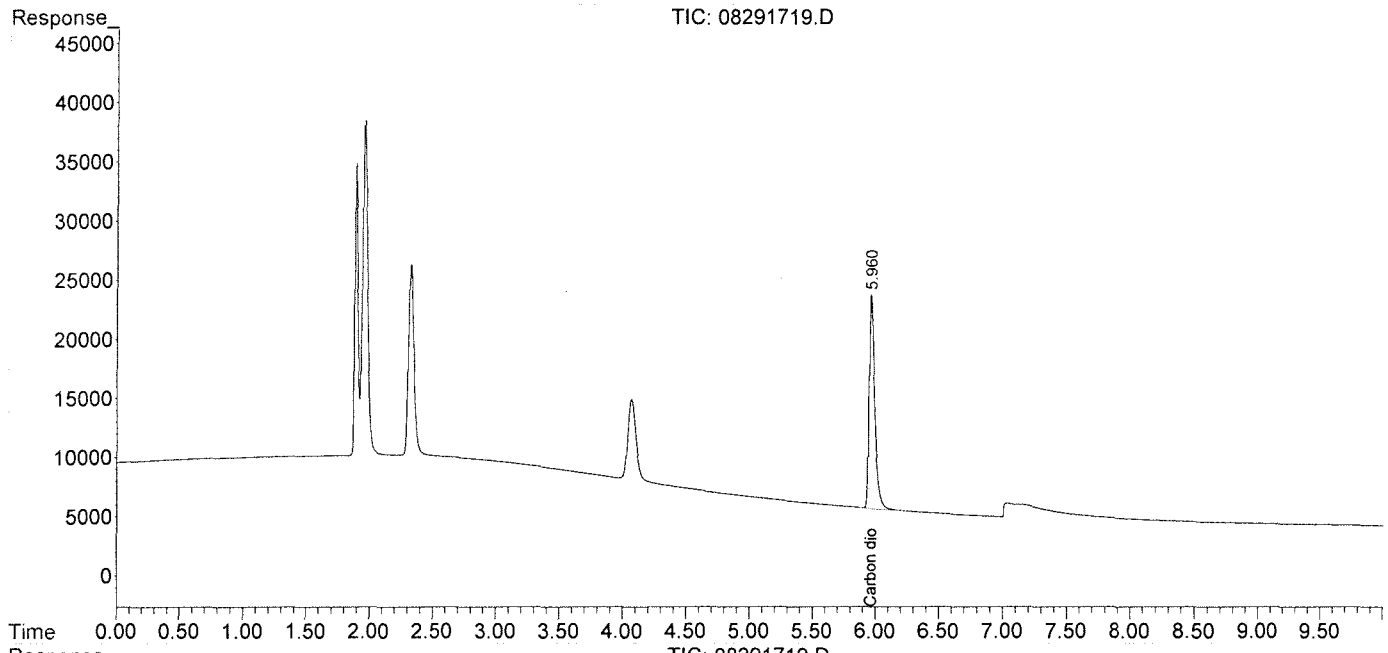
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.891	425113	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.962	568043	2369.673	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

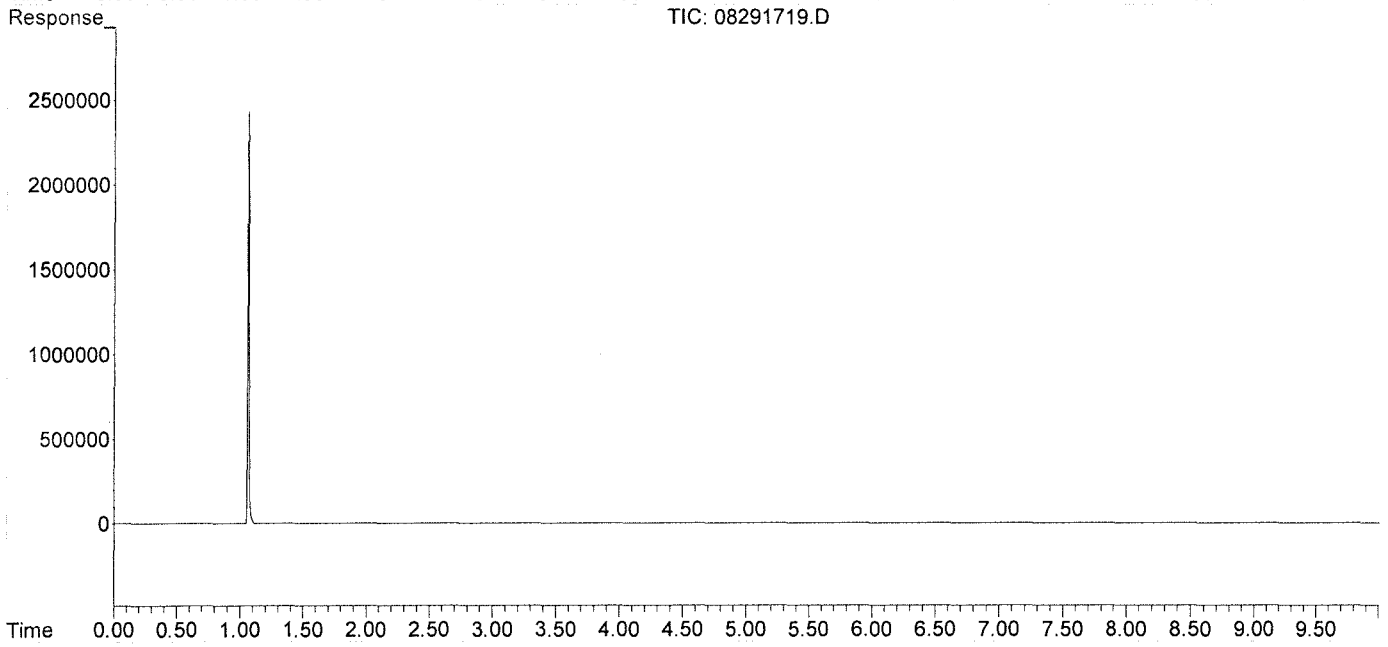
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291719.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:23
Operator : MC
Sample : 2500ppm s32-08231701 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:35:50 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:04:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291720.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:44
Operator : MC
Sample : 5000ppm s32-08231701 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:57:17 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:36:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

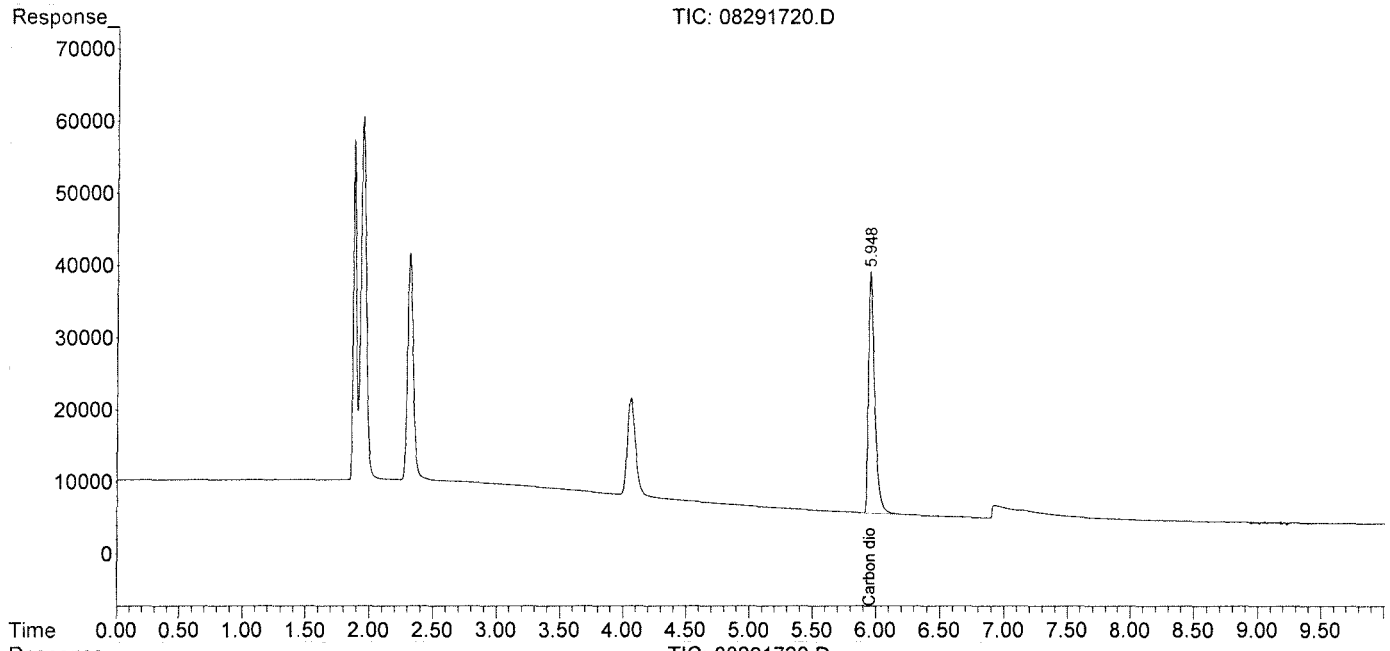
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.880	819221	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.948	1132363	4753.126	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

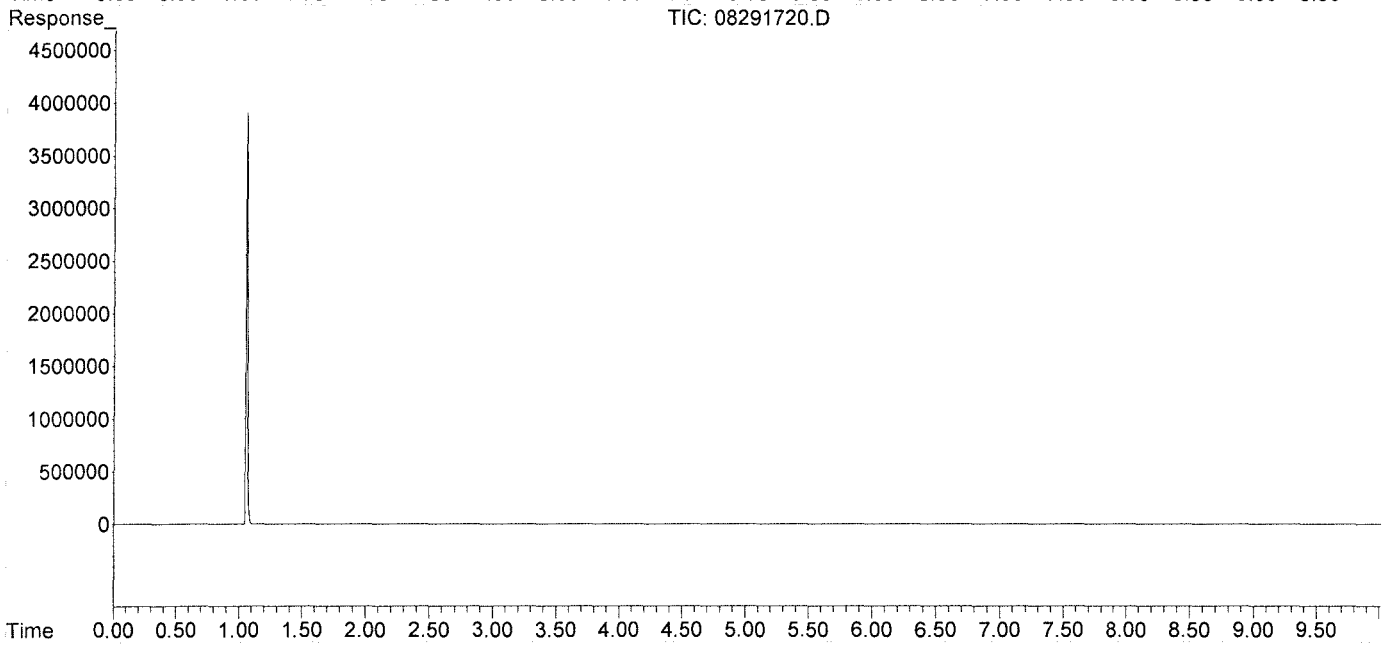
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291720.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:44
Operator : MC
Sample : 5000ppm s32-08231701 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:57:17 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:36:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291721.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:00
Operator : MC
Sample : 25000ppm s32-08231701 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:12:53 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:57:37 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

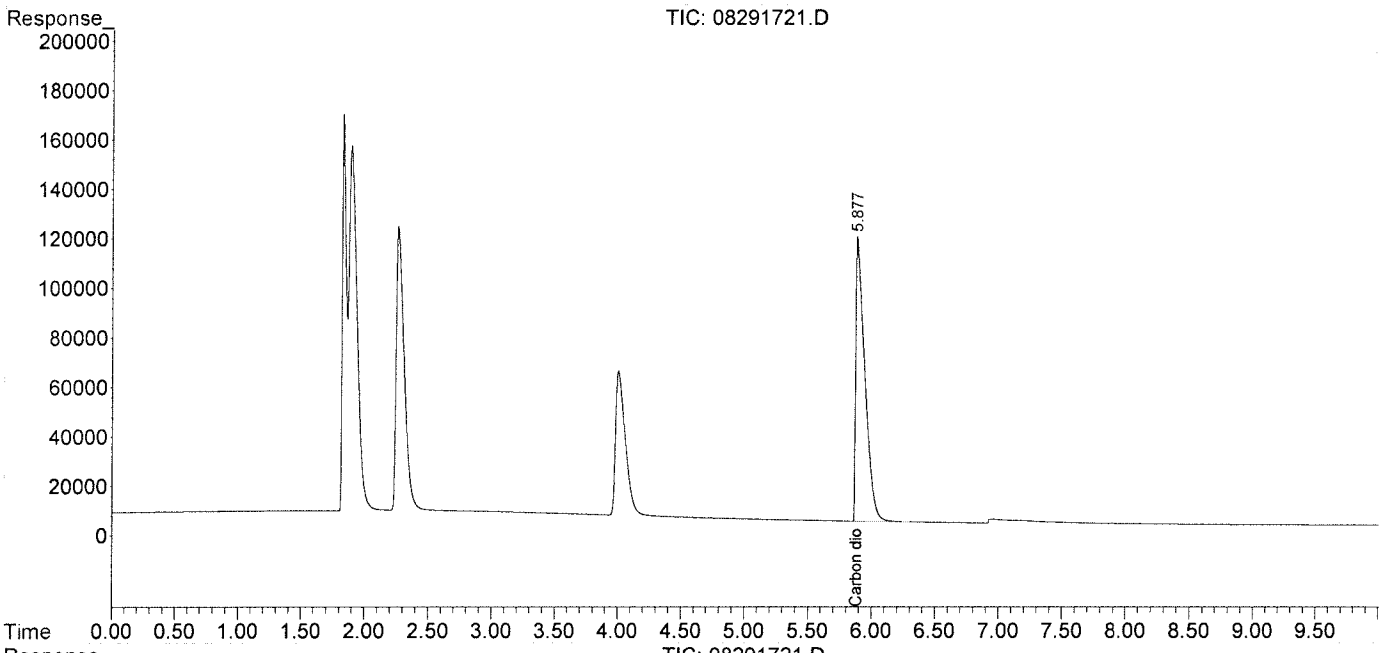
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.827	3325463	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.879f	5744295	24443.288	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

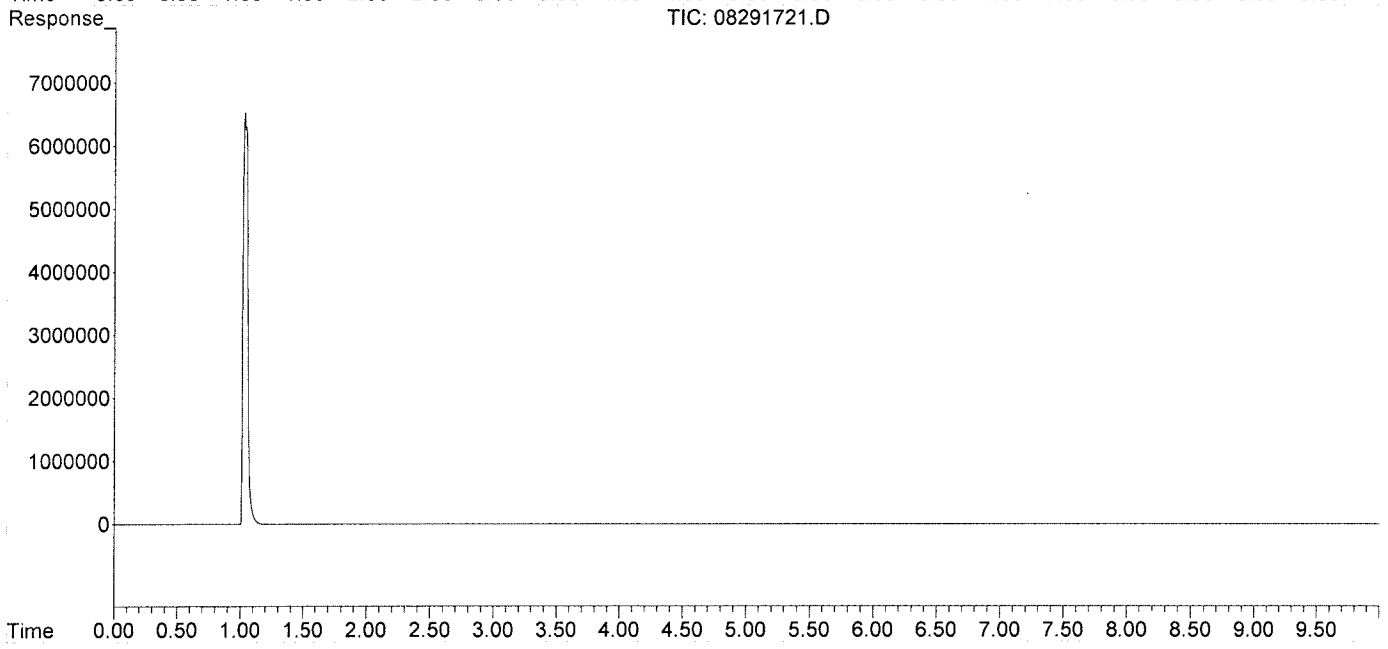
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291721.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:00
Operator : MC
Sample : 25000ppm s32-08231701 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:12:53 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:57:37 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291723.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:35
Operator : MC
Sample : icv s30-07071701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:54:07 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.886	536422	0.113	ppm
2)	Carbon monoxide	1.886	536422	N.D.	ppm
3)	Methane (TCD)	4.059f	626500	66244.710	ppm
4)	Carbon dioxide	5.947	1163775	4957.948	ppm
6)	Methane (FID)	1.062	37290742	3947.023	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

Actual %D
5000 99.16

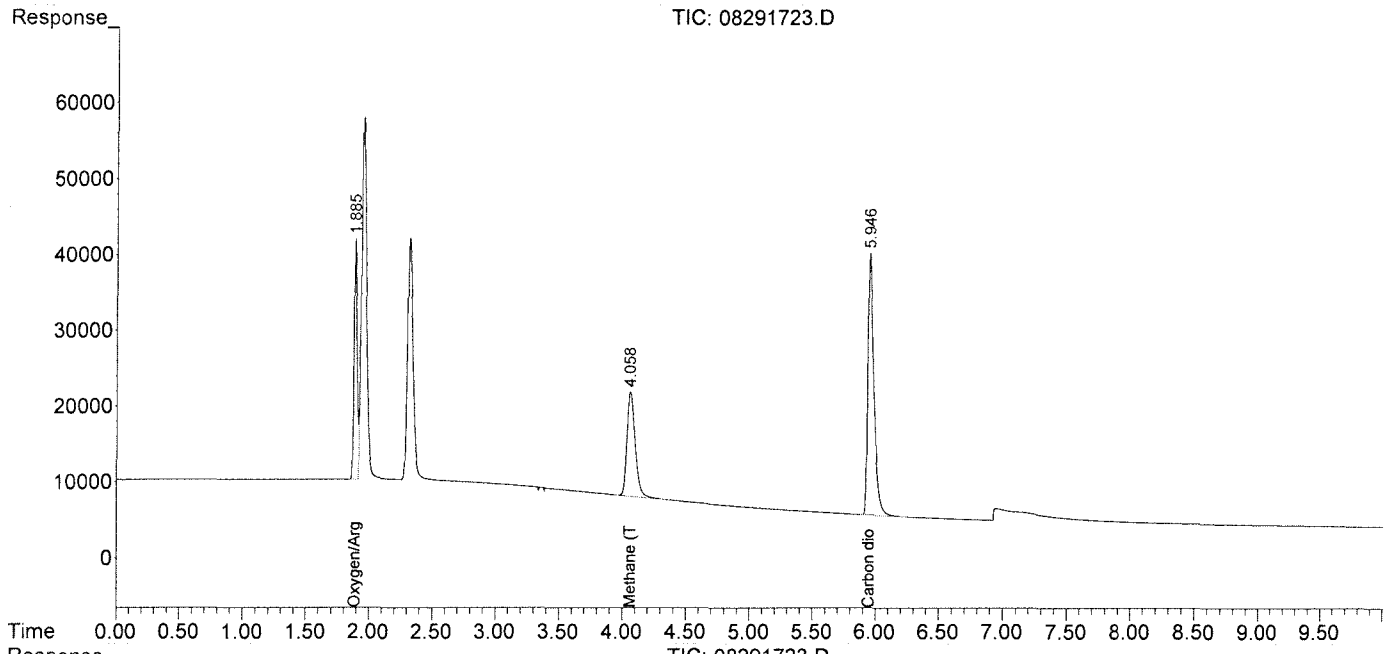
(f)=RT Delta > 1/2 Window (m)=manual int.

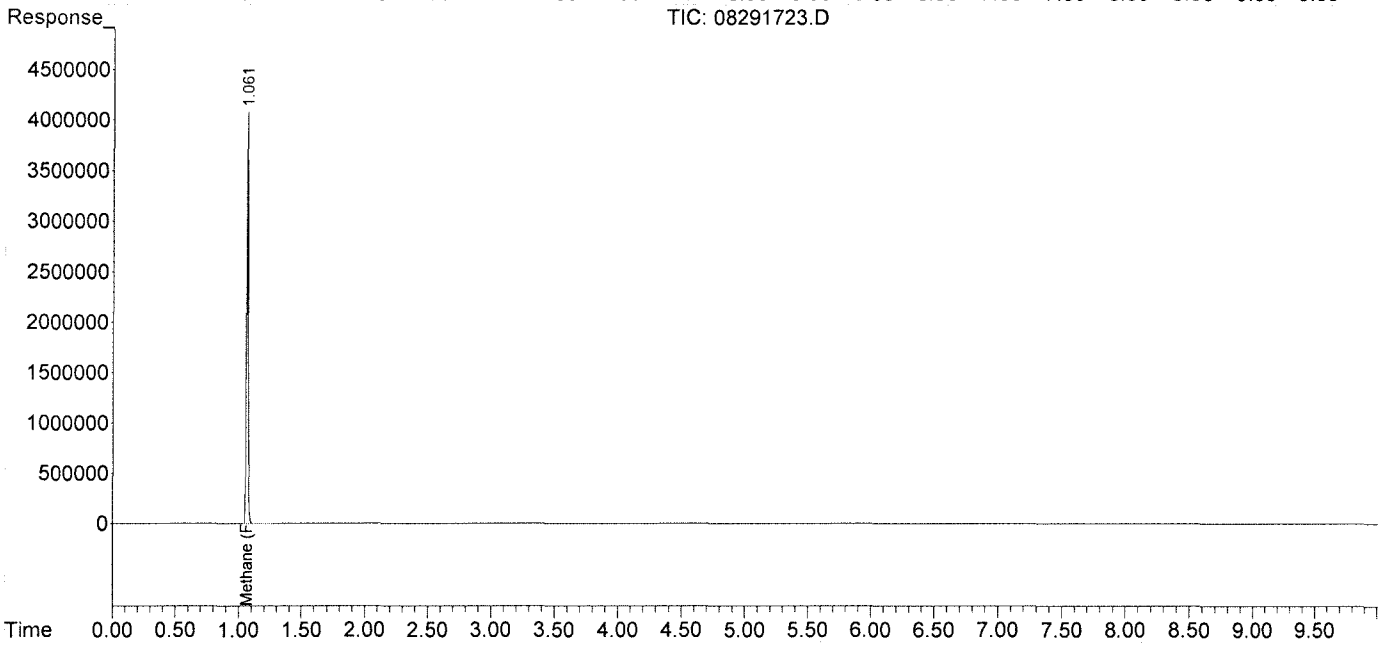
W 9/4/19

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291723.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:35
Operator : MC
Sample : icv s30-07071701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:54:07 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Dissolved Gases by RSK175

ALS Environmental

Method : RSK175 Headspace Method for Dissolved Hydrocarbon in Water by FID/TCD

Client : ALS Laboratory Group | Analyst : WH | Instrument : GC#10

Service Request: P2005613 | Date Analysis : 10/13/20 | Detector : FID#10, TCD#10

Sample Vol. (ml) : 32.00 ml | Head Space Vol.(ml) : 8.00 ml | Gas Constant : 24.05684 (20°C)

FINAL RESULT (ug/L)

Sample ID	Carbon Dioxide
RL	**1000.00**
mcs 01ml	ND
rb 01ml	ND
tcd lcs 0.1ml	21716.89
tcd lcsd 0.1ml	21288.85
P2005613-001 0.1ml	171332.5
P2005613-002 0.1ml	308899.8
P2005613-003 0.1ml	74345.7
P2005613-004 0.1ml	79287.0
P2005613-005 0.1ml	93315.9
P2005613-006 0.1ml	139454.8

SPIKE RECOVERY SUMMARY (ug/L)

Sample ID	Carbon Dioxide
mcs 01ml	ND
Amount Spiked	22914.48
tcd lcs	21716.89
% Recovered	94.8%
tcd lcsd	21288.85
% Recovered	92.9%
% RPD	2.0%
Amount Spiked	22914.5
P2005613-001ms 0.1ml	198897.7
	120.3%
P2005613-001msd 0.1ml	197539.6
	114.4%
	5.1%

P2005613-001ms 0.1ml	198897.7
P2005613-001msd 0.1ml	197539.6

Calculation :

1). Final Headspace Result (ppm) = ppm / Actual Injection Volume (mL)

2). Gas in Water (ug/L) : =[Final Headspace Result (mL) / 10^6 mL * 55.51 mole/L * MWt.(16.04 g/mole for CH4) * 1000 mg/g * 1000 ug/mg]/Henry's Constant

3). Gas in Head Space (ug/L) : = Final Headspace Result (mL) / 10^6 mL * mole/24.06 L (gas constant @20°C) * MWt.(16.04 g/mole for CH4) * 1000 mg/g * 1000 ug/g * L/1000mL * Headspace Volume (mL) / Sample Volume (mL) * 1000 mL/L

4.) Total final result : = 1) + 2)

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132001.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 12:25:39
Operator : WH
Sample : STD S32-06222001
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 12:38:16 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

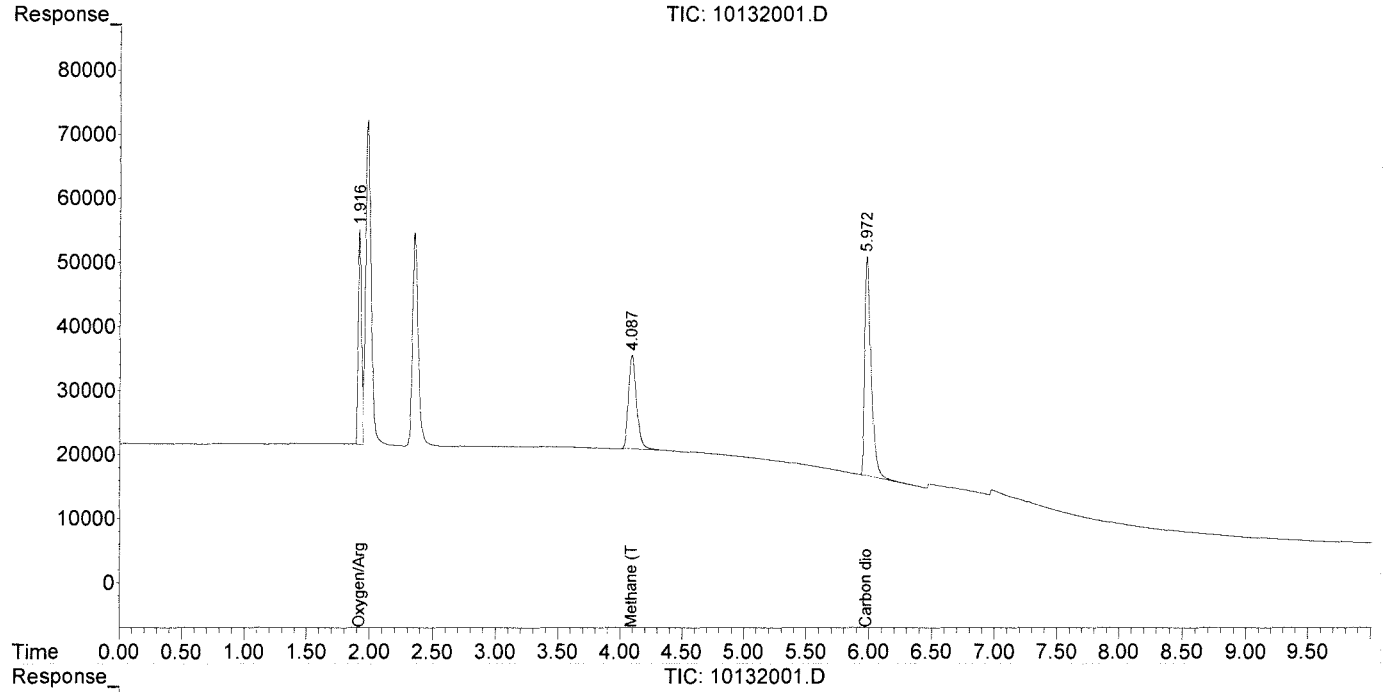
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.917f	588079	0.124	ppm
2)	Carbon monoxide	1.917f	588079	N.D.	ppm
3)	Methane (TCD)	4.088f	664246	70235.959	ppm
4)	Carbon dioxide	5.973	1215306	5177.482	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

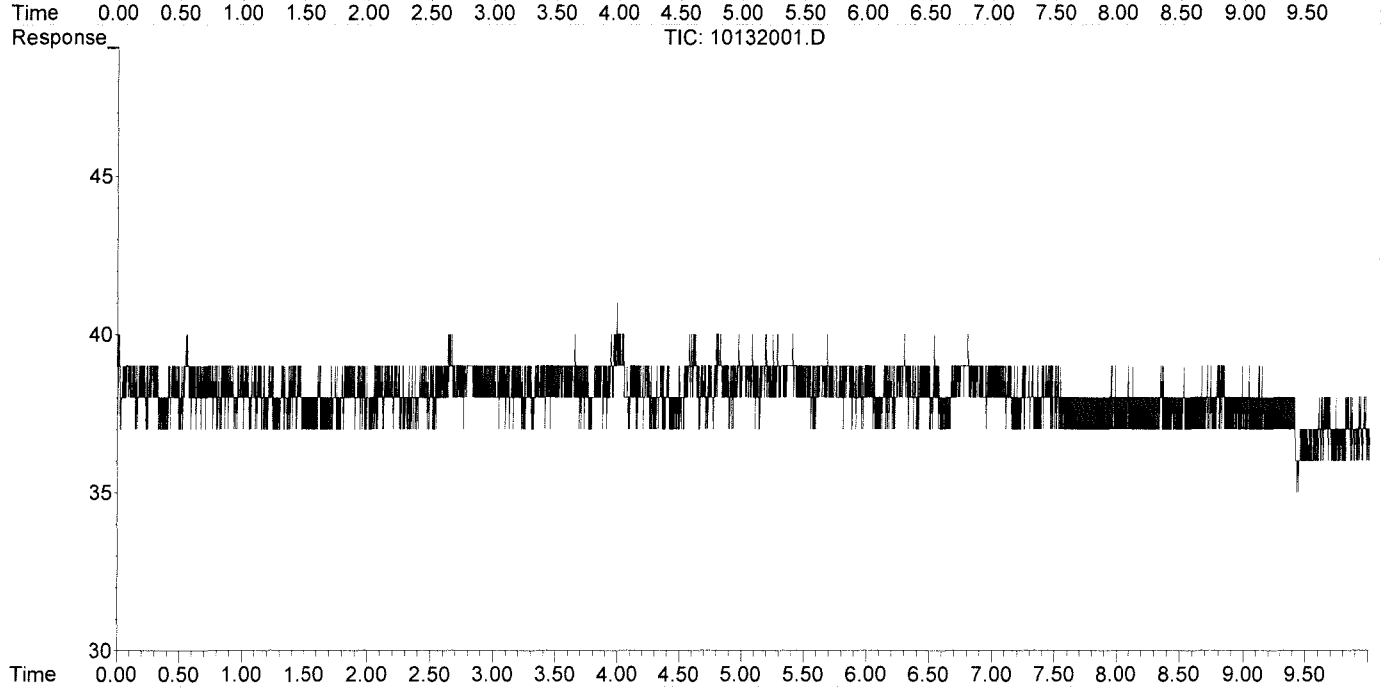
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132001.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 12:25:39
Operator : WH
Sample : STD S32-06222001
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 12:38:16 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132014.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 16:32:01
Operator : WH
Sample : STD S32-06222001
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 17:01:03 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

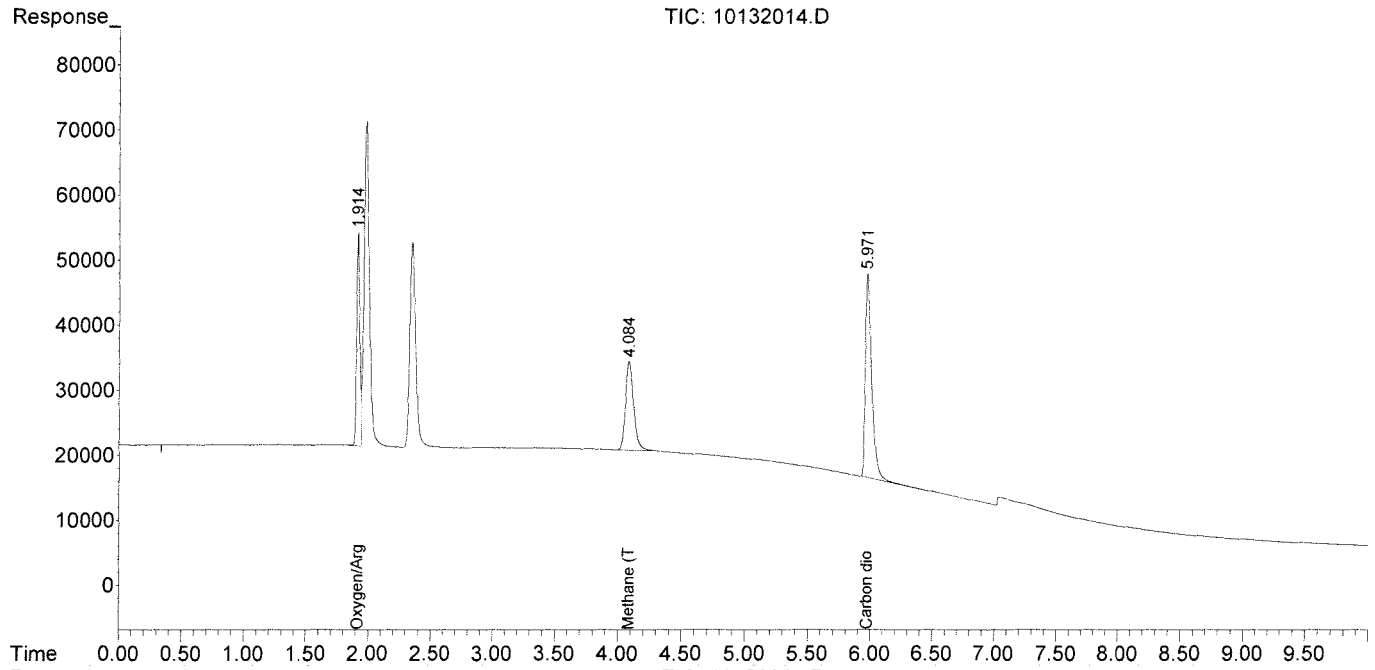
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.914f	575339	0.121	ppm
2)	Carbon monoxide	1.914f	575339	N.D.	ppm
3)	Methane (TCD)	4.085f	617645	65308.419	ppm
4)	Carbon dioxide	5.972	1113489	4743.720	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

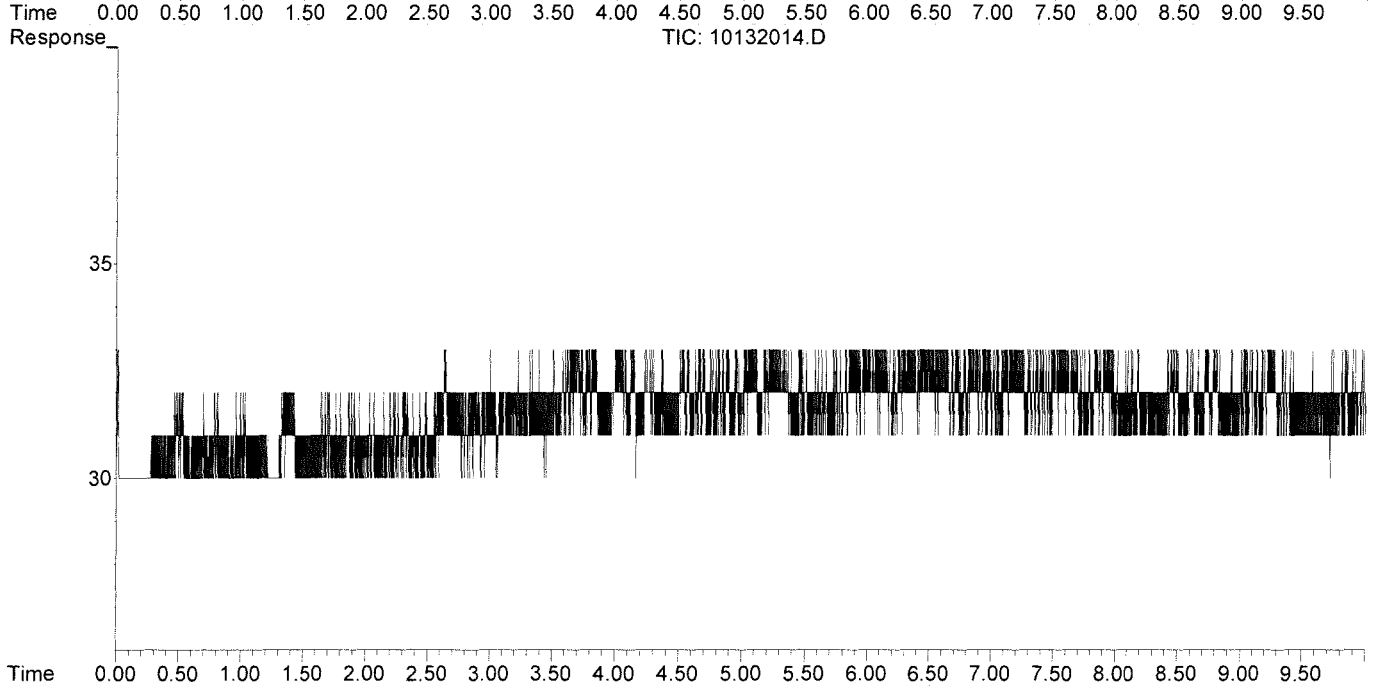
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2020_10\13\
Data File : 10132014.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Oct-2020, 16:32:01
Operator : WH
Sample : STD S32-06222001
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 13 17:01:03 2020
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Injection Log

Directory: I:\GC10\DATA\RSK_FID\2017_08\29\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	29-Aug-17, 07:58:00	08291701.D	std s30-06161601		MC	RSKBOTH.M	Pass
2	29-Aug-17, 08:11:02	08291702.D	mb 0.5ml		MC	RSKBOTH.M	Pass
3	29-Aug-17, 08:24:13	08291703.D	4089-001 0.5ml		MC	RSKBOTH.M	
4	29-Aug-17, 08:39:29	08291704.D	4089-002 0.5ml		MC	RSKBOTH.M	
5	29-Aug-17, 08:53:38	08291705.D	4089-003 0.5ml		MC	RSKBOTH.M	
6	29-Aug-17, 09:33:52	08291706.D	4089-004 0.5ml		MC	RSKBOTH.M	
7	29-Aug-17, 09:50:51	08291707.D	4089-005 0.5ml		MC	RSKBOTH.M	
8	29-Aug-17, 10:07:54	08291708.D	4089-006 0.5ml		MC	RSKBOTH.M	
9	29-Aug-17, 10:42:34	08291709.D	4089-007 0.5ml		MC	RSKBOTH.M	
10	29-Aug-17, 11:06:01	08291710.D	4089-008 0.5ml		MC	RSKBOTH.M	
11	29-Aug-17, 11:23:53	08291711.D	4089-009 0.5ml		MC	RSKBOTH.M	
12	29-Aug-17, 11:37:17	08291712.D	lcs s30-05241604		MC	RSKBOTH.M	Pass
13	29-Aug-17, 11:50:31	08291713.D	lcs s30-05241604		MC	RSKBOTH.M	Pass
14	29-Aug-17, 12:29:45	08291714.D	std s30-06161601		MC	RSKBOTH.M	Pass
15	29-Aug-17, 14:07:01	08291715.D	25ppm s32-08291701 0.25ml		MC	RSKBOTH.M	Curve
16	29-Aug-17, 14:22:12	08291716.D	100ppm s32-08291702 0.2ml		MC	RSKBOTH.M	Curve
17	29-Aug-17, 14:53:00	08291717.D	250ppm s32-08291702 0.5ml		MC	RSKBOTH.M	Curve
18	29-Aug-17, 15:07:43	08291718.D	mis inject		MC	RSKBOTH.M	
19	29-Aug-17, 15:23:21	08291719.D	2500ppm s32-08231701 50ul		MC	RSKBOTH.M	Curve
20	29-Aug-17, 15:44:54	08291720.D	5000ppm s32-08231701 0.1ml		MC	RSKBOTH.M	Curve
21	29-Aug-17, 16:00:09	08291721.D	25000ppm s32-08231701 0.5ml		MC	RSKBOTH.M	Curve
22	29-Aug-17, 16:15:43	08291722.D	mb 0.1ml		MC	RSKBOTH.M	Pass
23	29-Aug-17, 16:35:37	08291723.D	icv s30-07071701		MC	RSKBOTH.M	Pass

Injection Log

Directory: I:\GC10\DATA\RSK_TCD\2020_10\13\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	13-Oct-20, 12:25:39	10132001.D	STD S32-06222001		WH	RSKBOTH.M	pass
2	13-Oct-20, 12:39:57	10132002.D	rb 01ml		WH	RSKBOTH.M	pass
3	13-Oct-20, 12:55:09	10132003.D	mcs 01ml		WH	RSKBOTH.M	pass
4	13-Oct-20, 13:22:16	10132004.D	P2005613-002 0.1ml		WH	RSKBOTH.M	
5	13-Oct-20, 13:37:18	10132005.D	P2005613-003 0.1ml		WH	RSKBOTH.M	
6	13-Oct-20, 14:00:18	10132006.D	P2005613-004 0.1ml		WH	RSKBOTH.M	
7	13-Oct-20, 14:44:17	10132007.D	P2005613-005 0.1ml		WH	RSKBOTH.M	
8	13-Oct-20, 14:57:51	10132008.D	P2005613-006 0.1ml		WH	RSKBOTH.M	
9	13-Oct-20, 15:13:31	10132009.D	P2005613-001 0.1ml		WH	RSKBOTH.M	
10	13-Oct-20, 15:27:19	10132010.D	P2005613-001ms 0.1ml		WH	RSKBOTH.M	pass
11	13-Oct-20, 15:42:42	10132011.D	P2005613-001msd 0.1ml		WH	RSKBOTH.M	pass
12	13-Oct-20, 15:56:01	10132012.D	tcd lcs 0.1ml		WH	RSKBOTH.M	pass
13	13-Oct-20, 16:09:44	10132013.D	tcd lcsd 0.1ml		WH	RSKBOTH.M	pass
14	13-Oct-20, 16:32:01	10132014.D	STD S32-06222001		WH	RSKBOTH.M	pass

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082009.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 13:34:41
Operator : WH
Sample : P2005613-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 14:10:24 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

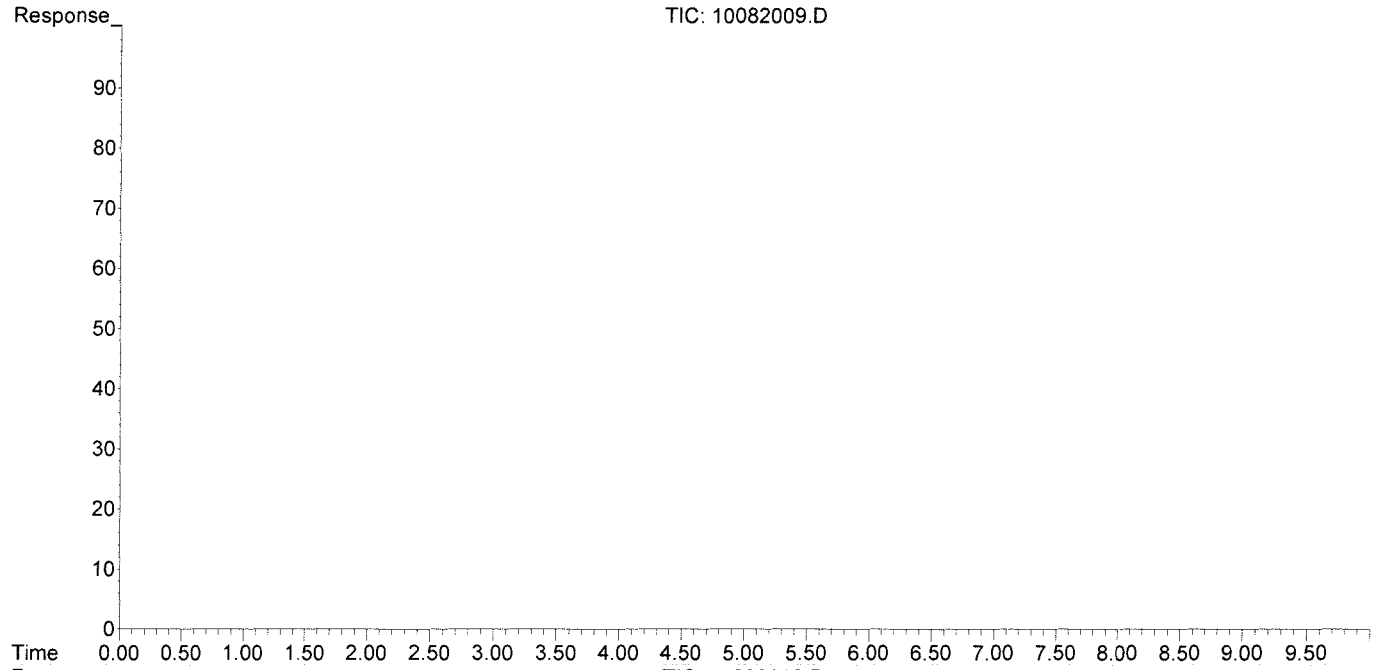
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.118	10348	1.141	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

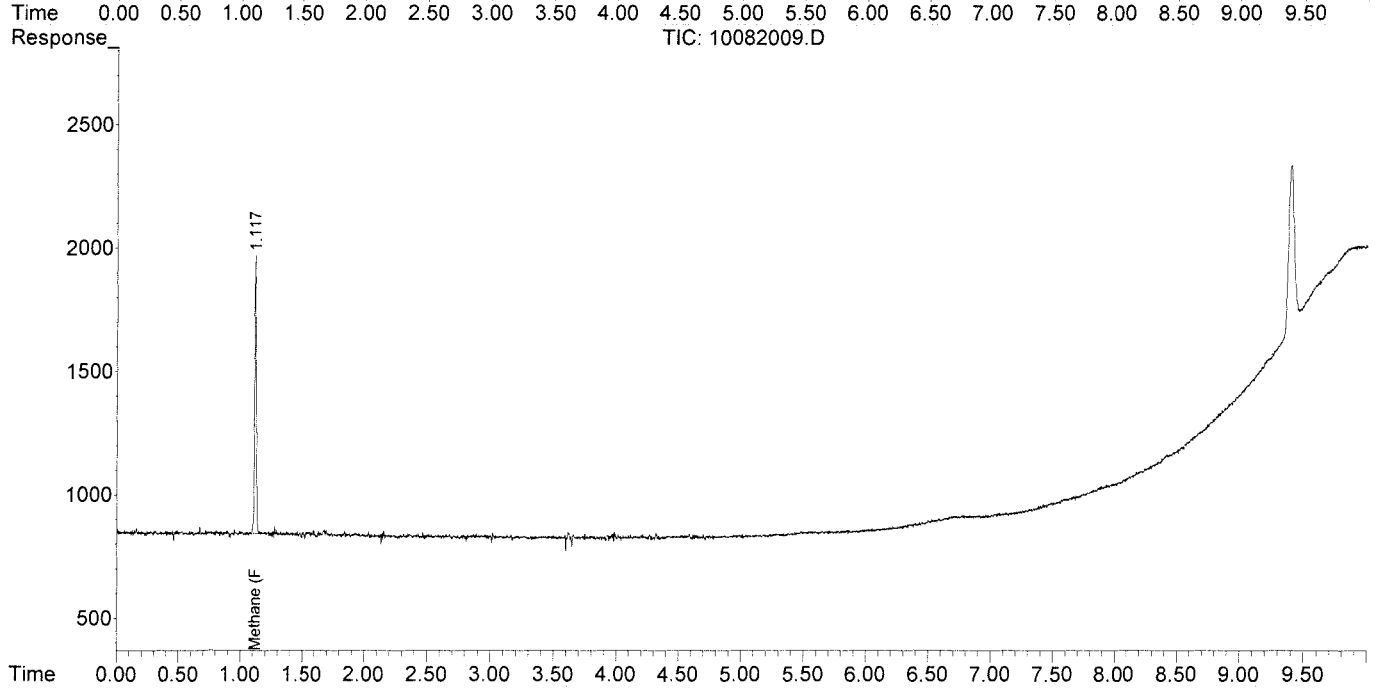
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082009.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 13:34:41
Operator : WH
Sample : P2005613-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 14:10:24 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082009.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 13:34:41
Operator : WH
Sample : P2005613-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 14:10:24 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

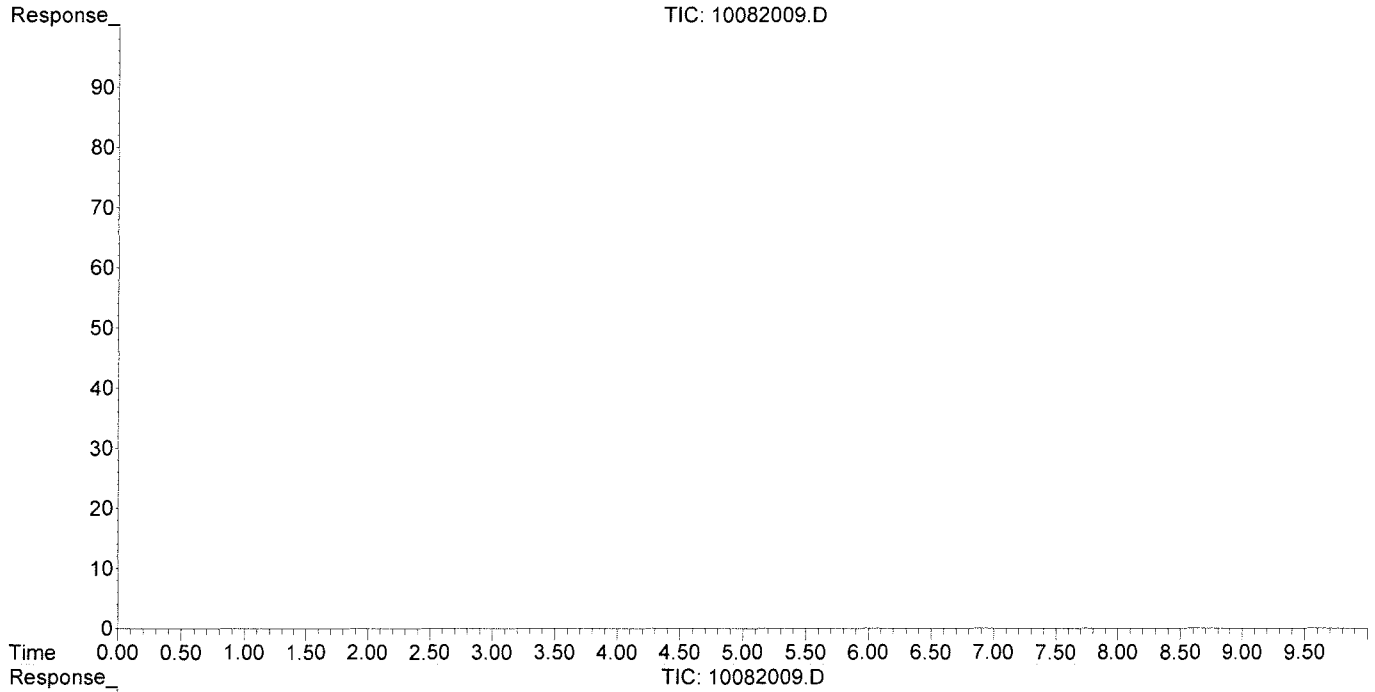
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.118	10348	1.141	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

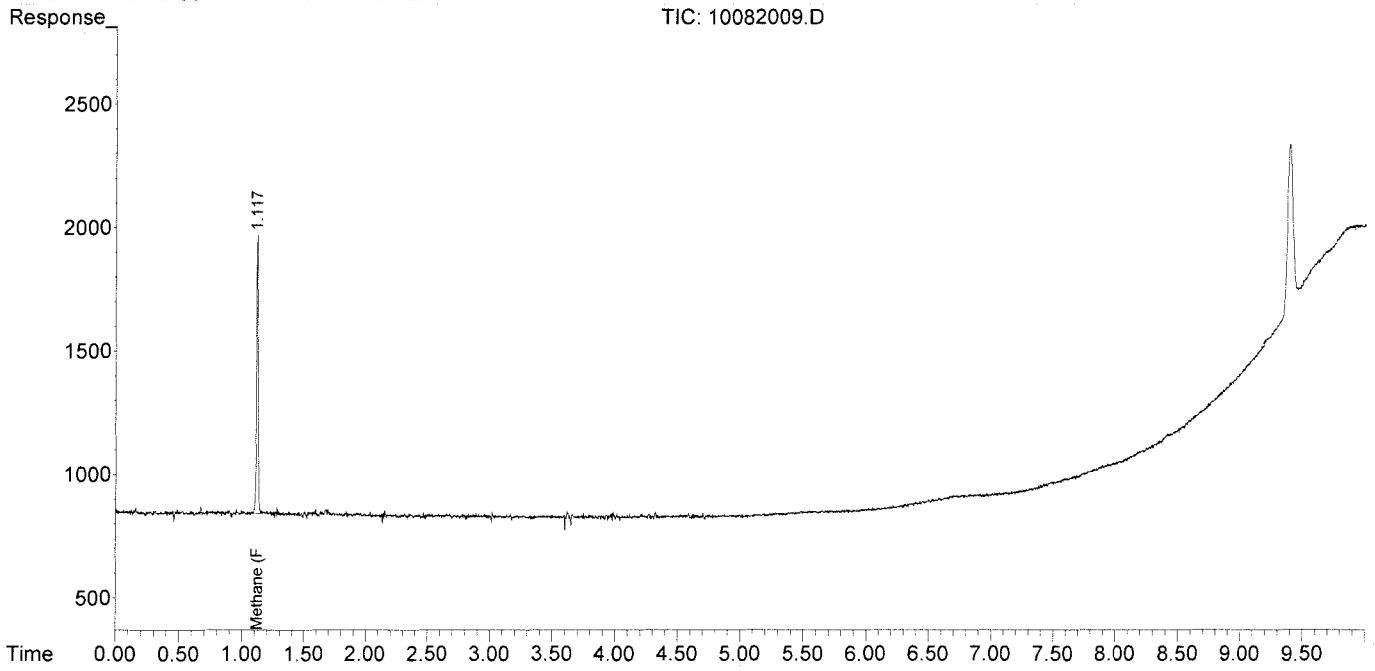
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082009.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 13:34:41
Operator : WH
Sample : P2005613-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 14:10:24 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082010.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 13:50:37
Operator : WH
Sample : P2005613-001ms 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 14:10:08 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

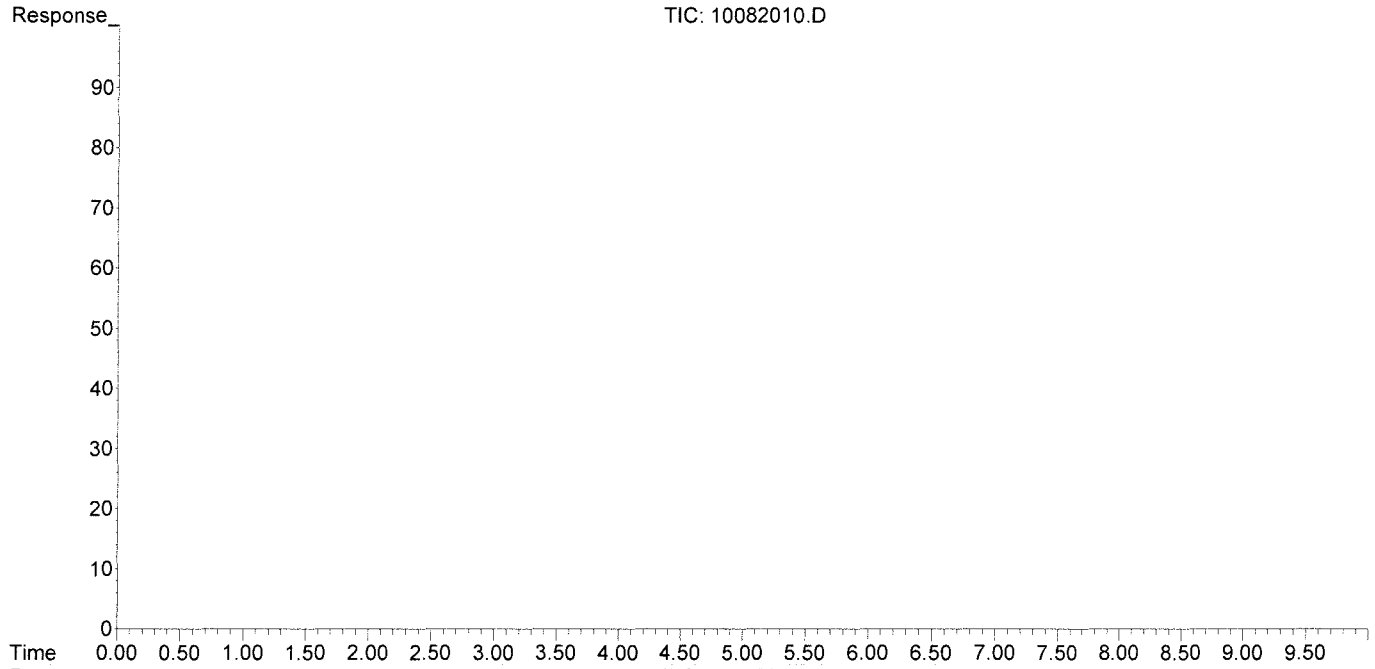
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.117	654642	72.172	ppm
7)	Ethylene	1.684	1102515	65.883	ppm
8)	Ethane	1.948	1234629	72.839	ppm
9)	Propylene	4.315	1549569	66.132	ppm
10)	Propane	4.436	1861020	74.799	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

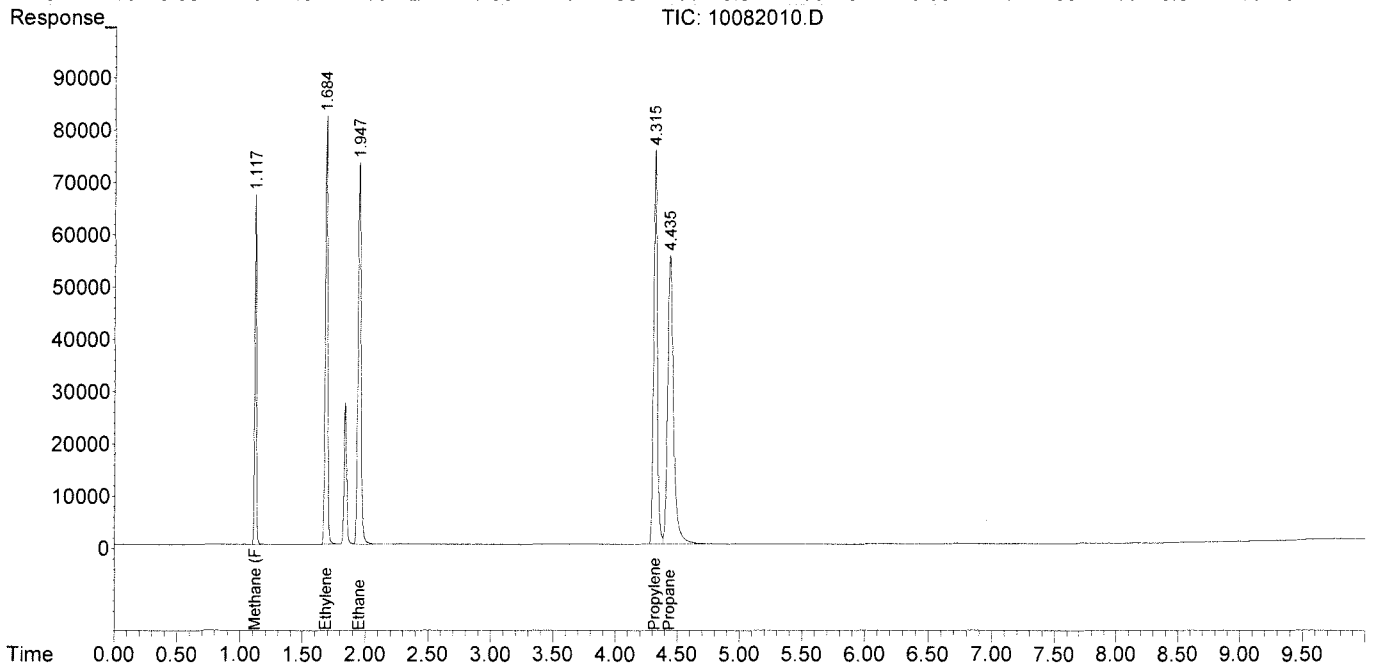
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082010.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 13:50:37
Operator : WH
Sample : P2005613-001ms 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 14:10:08 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082011.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 14:11:07
Operator : WH
Sample : P2005613-001msd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 15:02:58 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

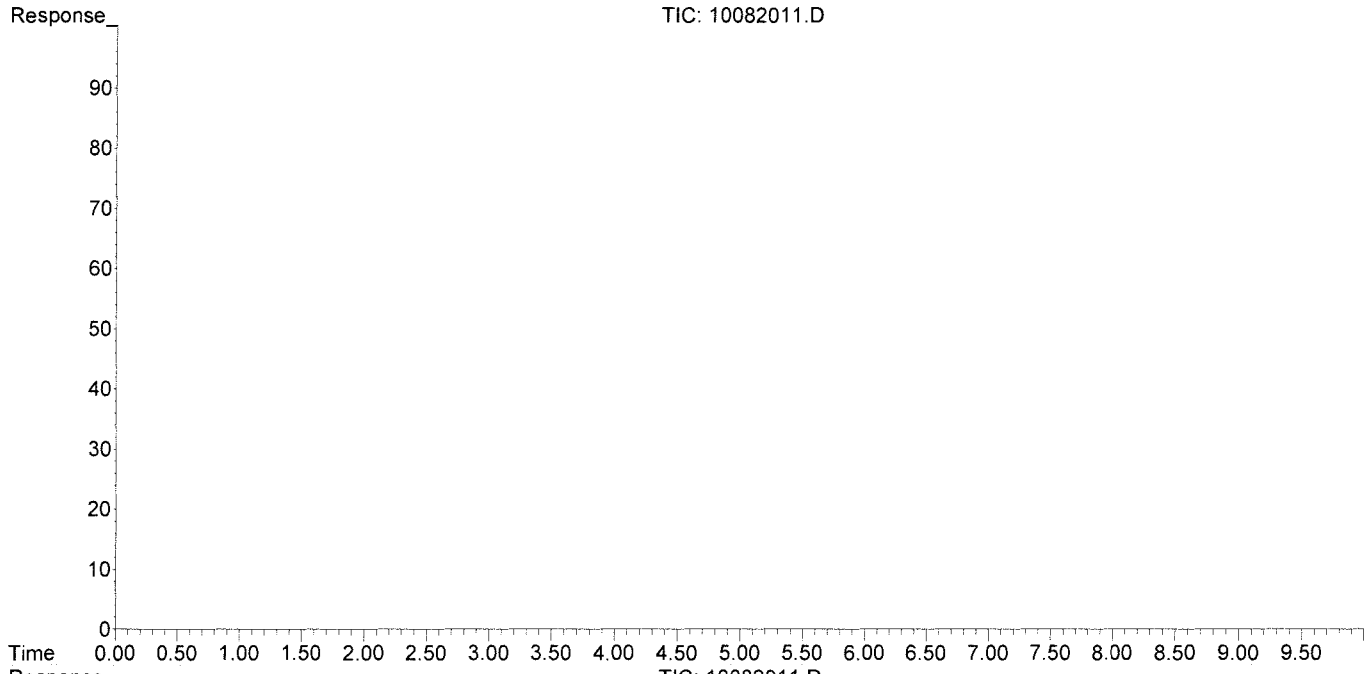
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.118	654517	72.158	ppm
7)	Ethylene	1.684	1091606	65.232	ppm
8)	Ethane	1.947	1232294	72.701	ppm
9)	Propylene	4.313	1536892	65.591	ppm
10)	Propane	4.433	1859966	74.757	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

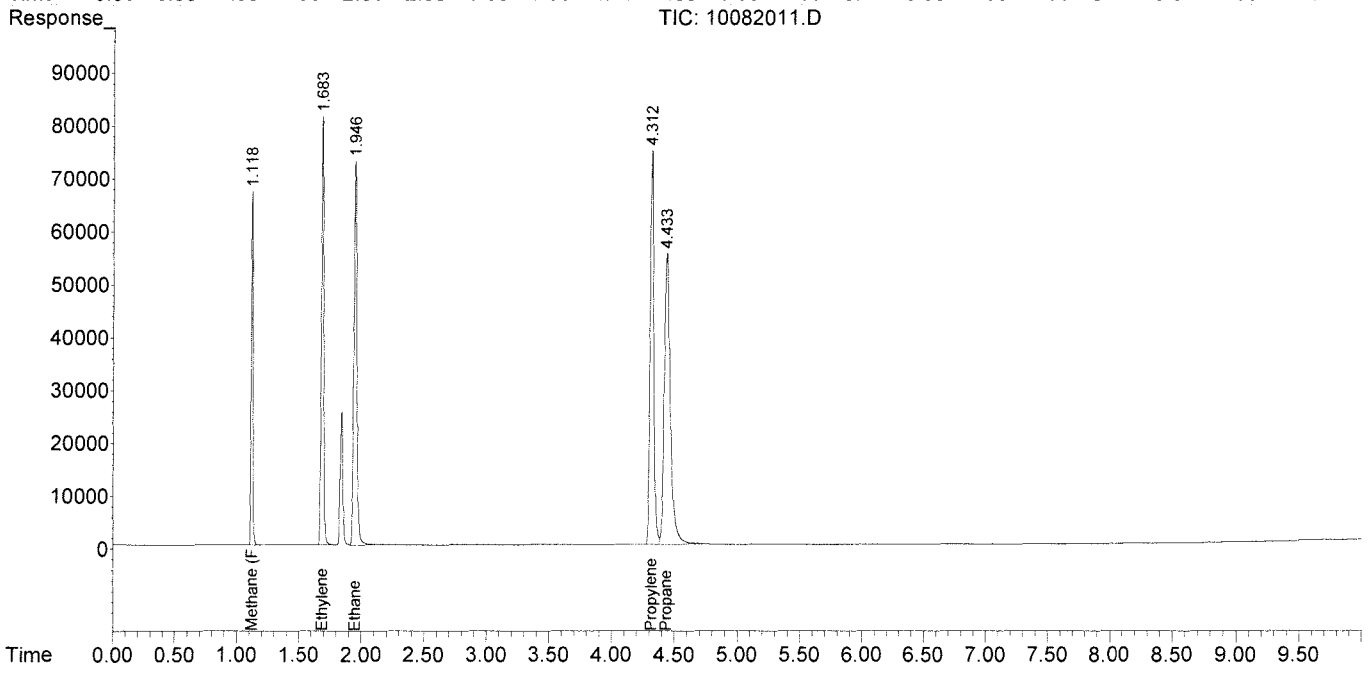
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082011.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 14:11:07
Operator : WH
Sample : P2005613-001msd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 15:02:58 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082004.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:25:34
Operator : WH
Sample : P2005613-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 12:54:10 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

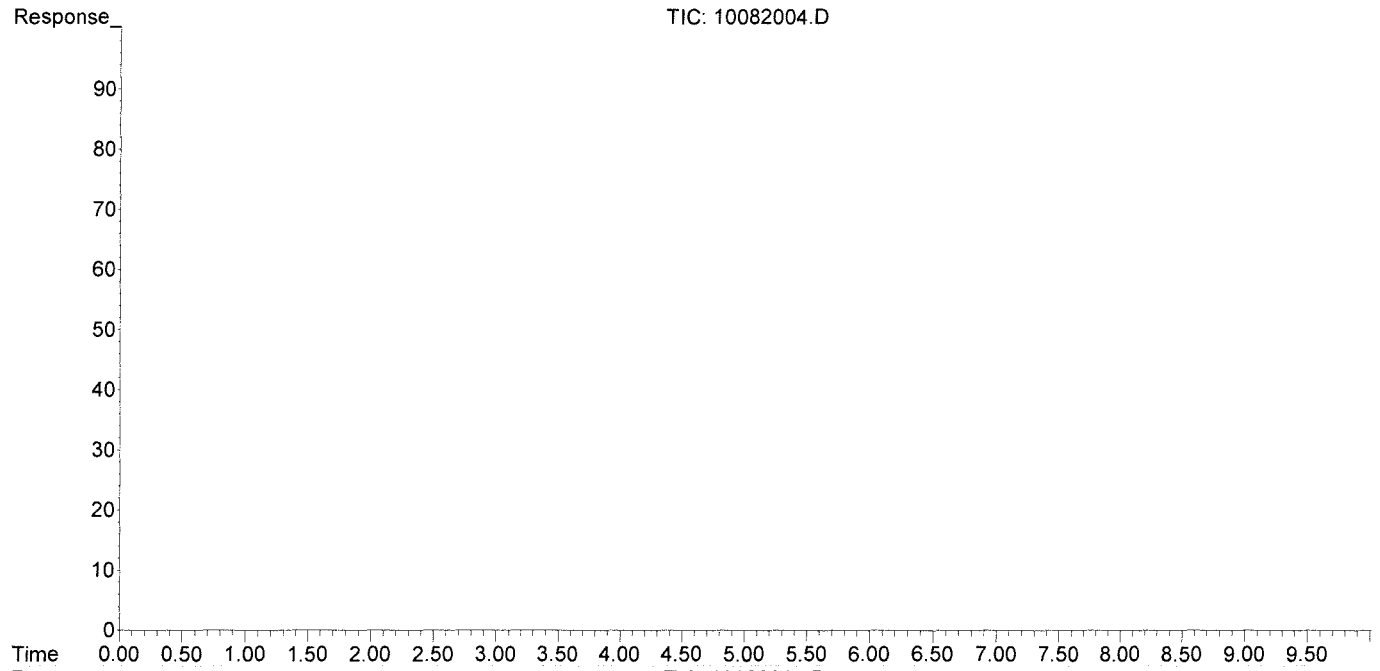
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.119	20137	2.220	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	6.387f	2138	328.015	ppm
12)	Isobutane	6.677	4773	0.179	ppm
13)	n-Butane	6.677	4773	0.179	ppm

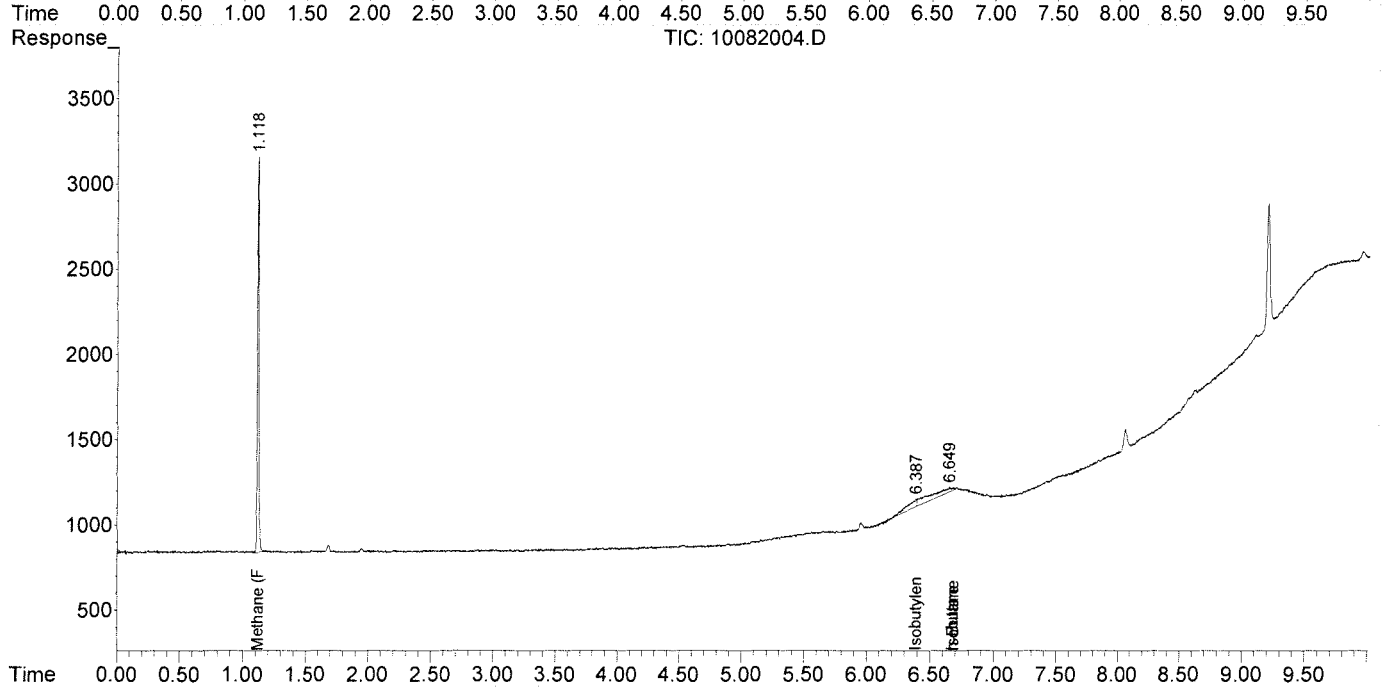
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082004.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:25:34
Operator : WH
Sample : P2005613-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 12:54:10 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082005.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:39:23
Operator : WH
Sample : P2005613-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 12:57:00 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

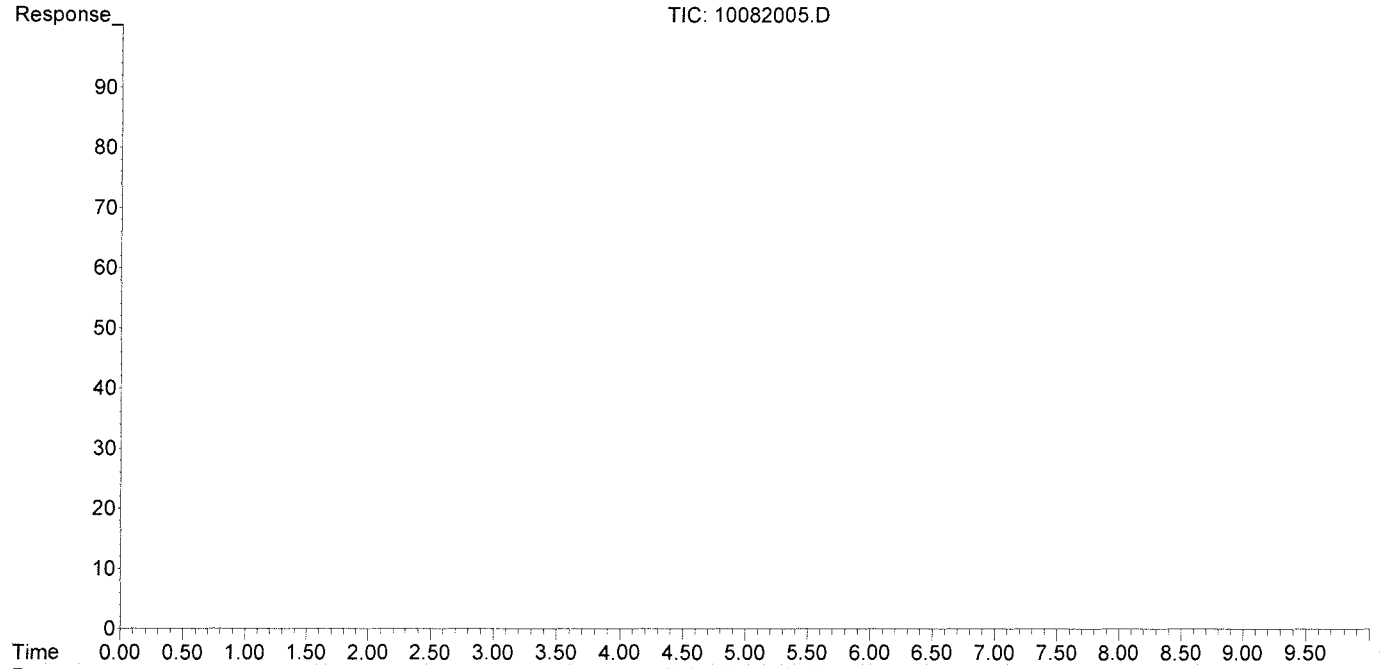
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.111	21851	2.409	ppm	
7)	Ethylene	1.678	533	0.032	ppm	m
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.738	9757	0.367	ppm	
13)	n-Butane	6.738	9757	0.367	ppm	

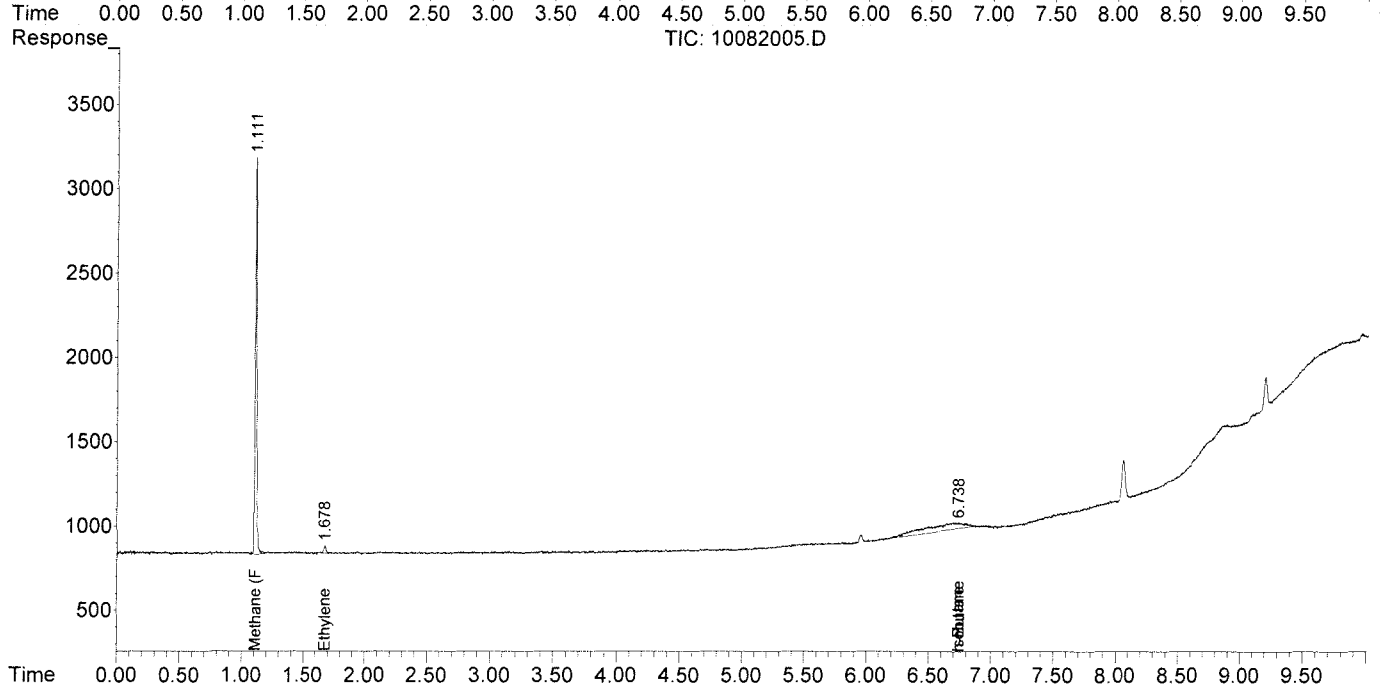
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082005.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:39:23
Operator : WH
Sample : P2005613-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 12:57:00 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



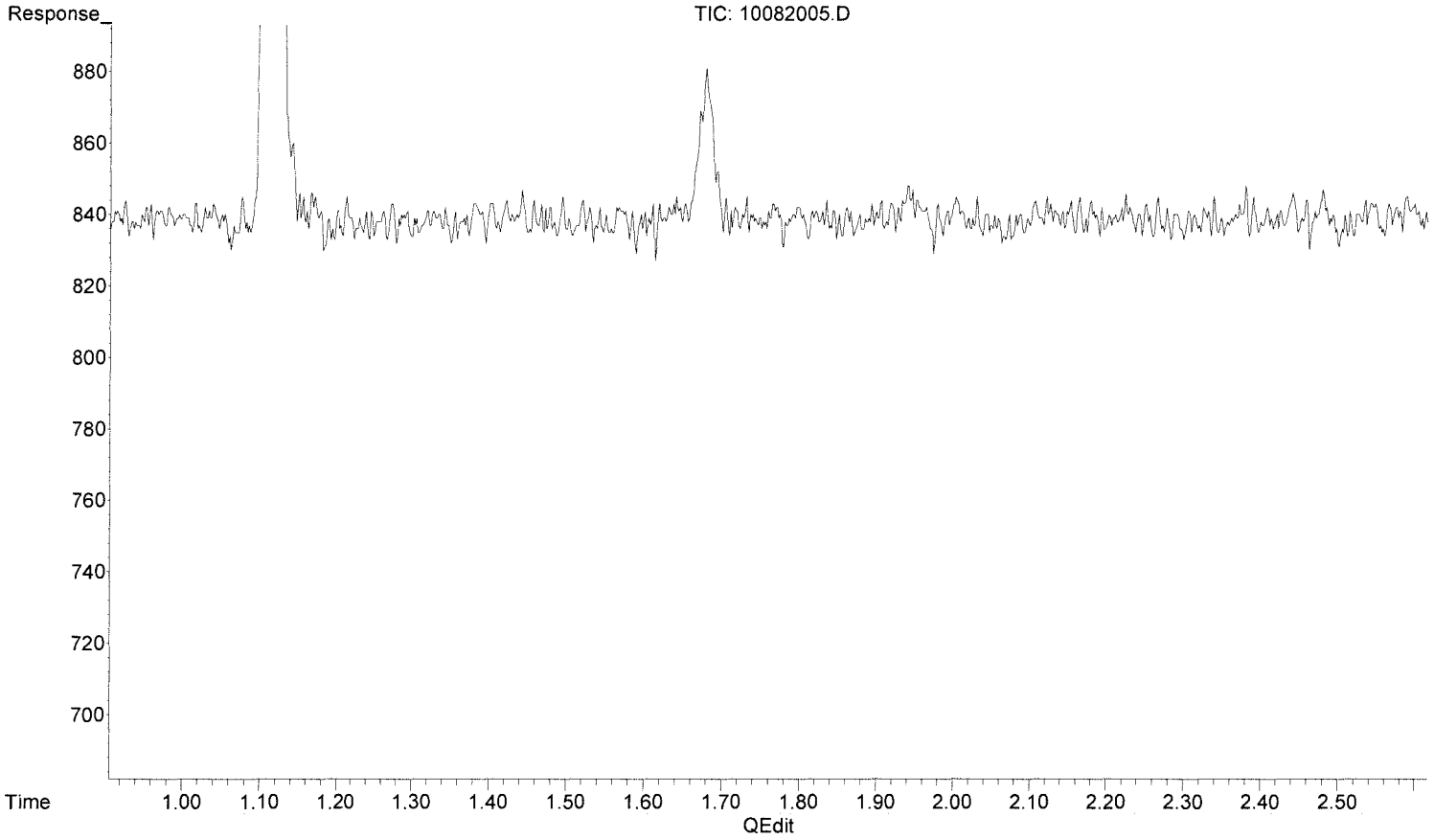


01078939

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082005.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:39:23
Operator : WH
Sample : P2005613-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 12:57:00 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(7) Ethylene

1.668min 0.000 ppm

response 0

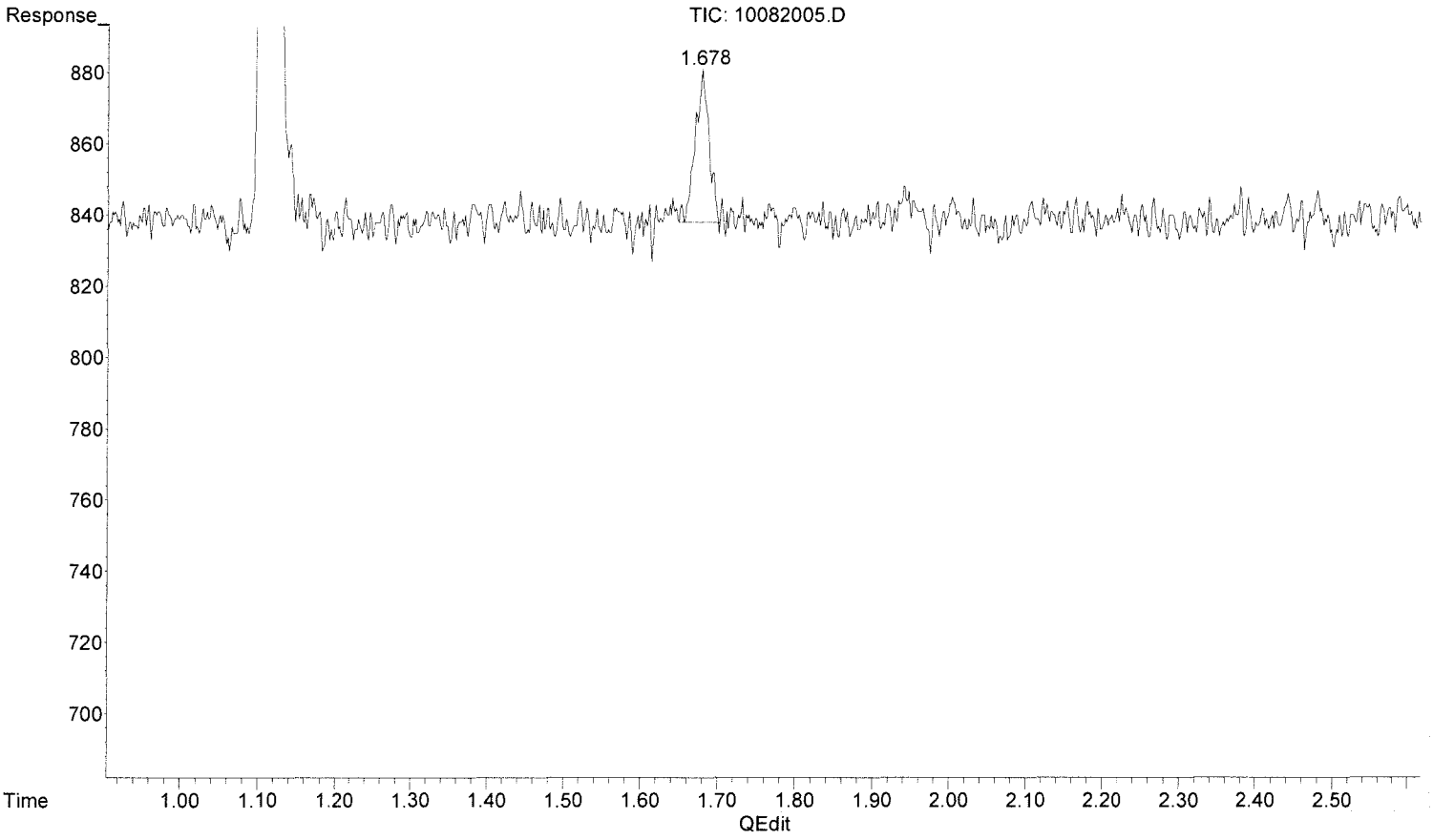
(+) = Expected Retention Time

01078940

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082005.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:39:23
Operator : WH
Sample : P2005613-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 12:57:00 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(7) Ethylene

1.678min 0.032 ppm m

response 533

MR 10/14/20

(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082006.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:53:36
Operator : WH
Sample : P2005613-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 13:04:43 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

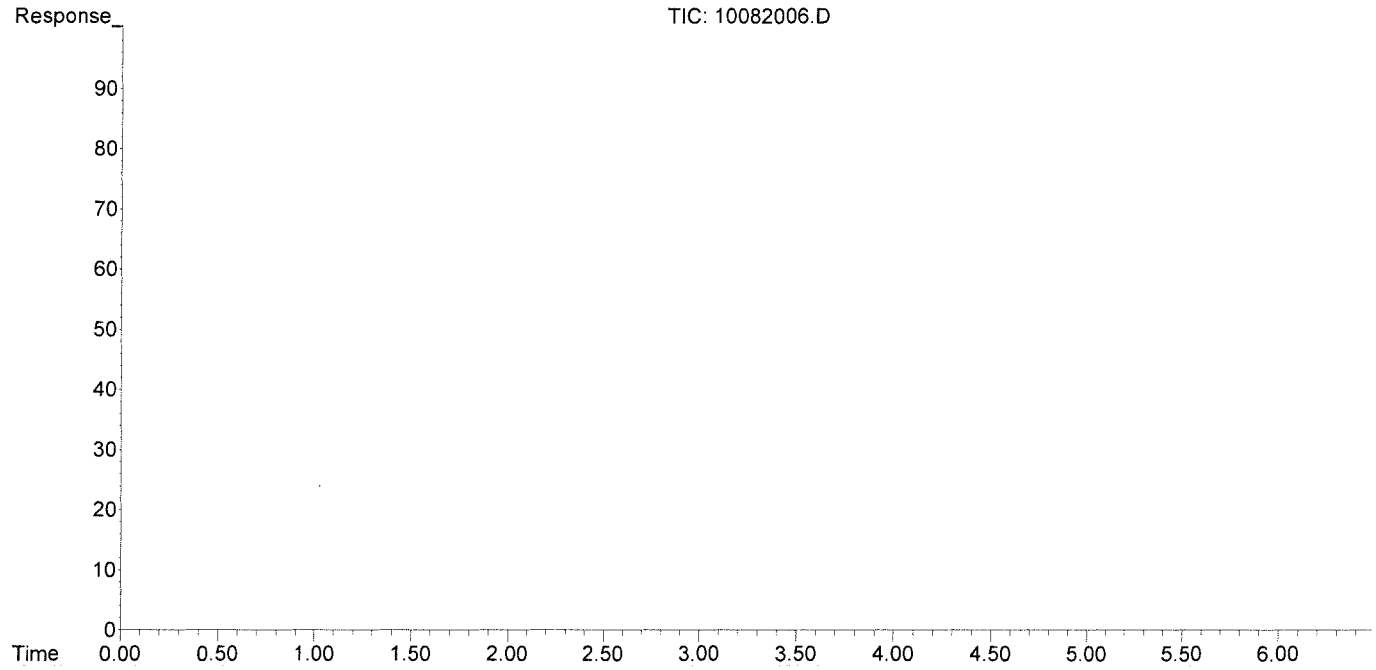
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.101	24300	2.679	ppm	
7)	Ethylene	1.665	663	0.040	ppm	m
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

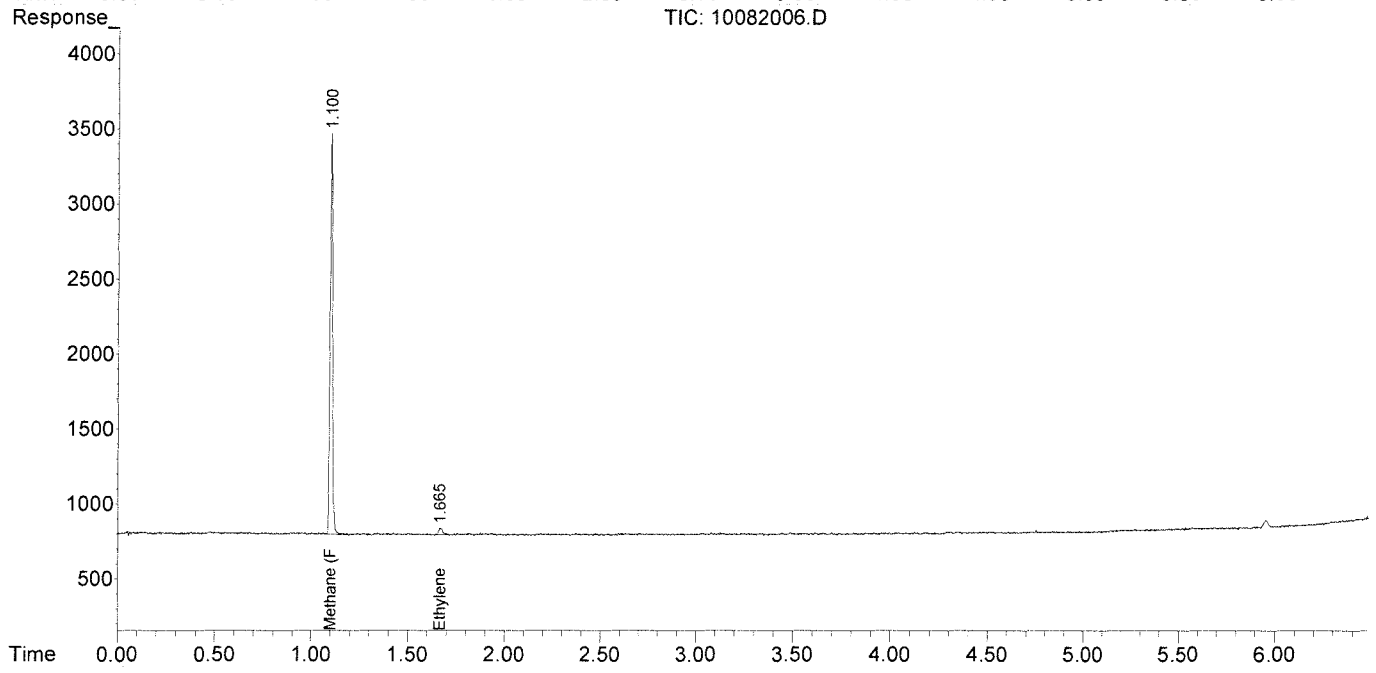
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082006.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:53:36
Operator : WH
Sample : P2005613-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 13:04:43 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



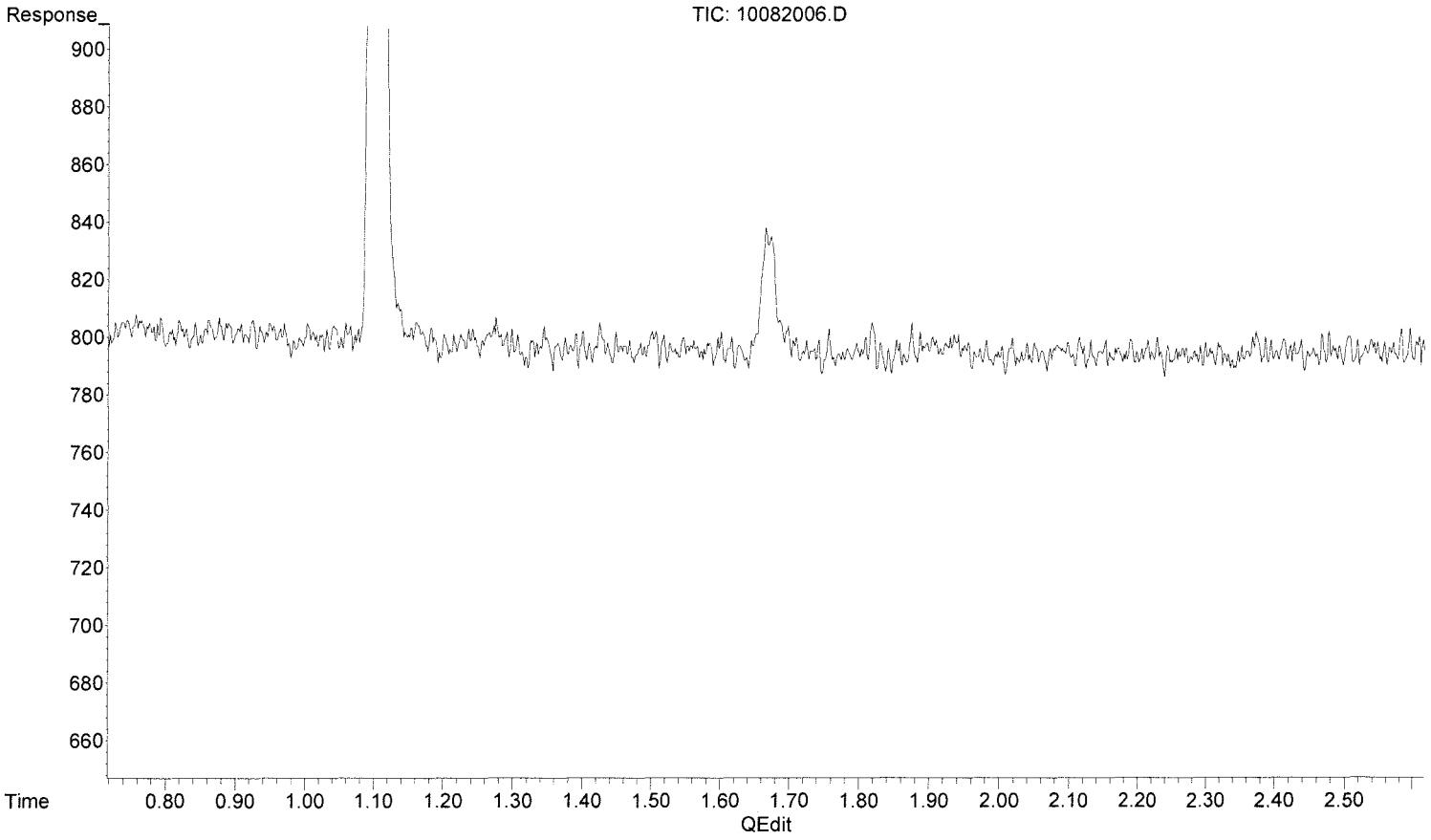


01078943

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082006.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:53:36
Operator : WH
Sample : P2005613-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 13:04:43 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(7) Ethylene

1.668min 0.000 ppm

response 0

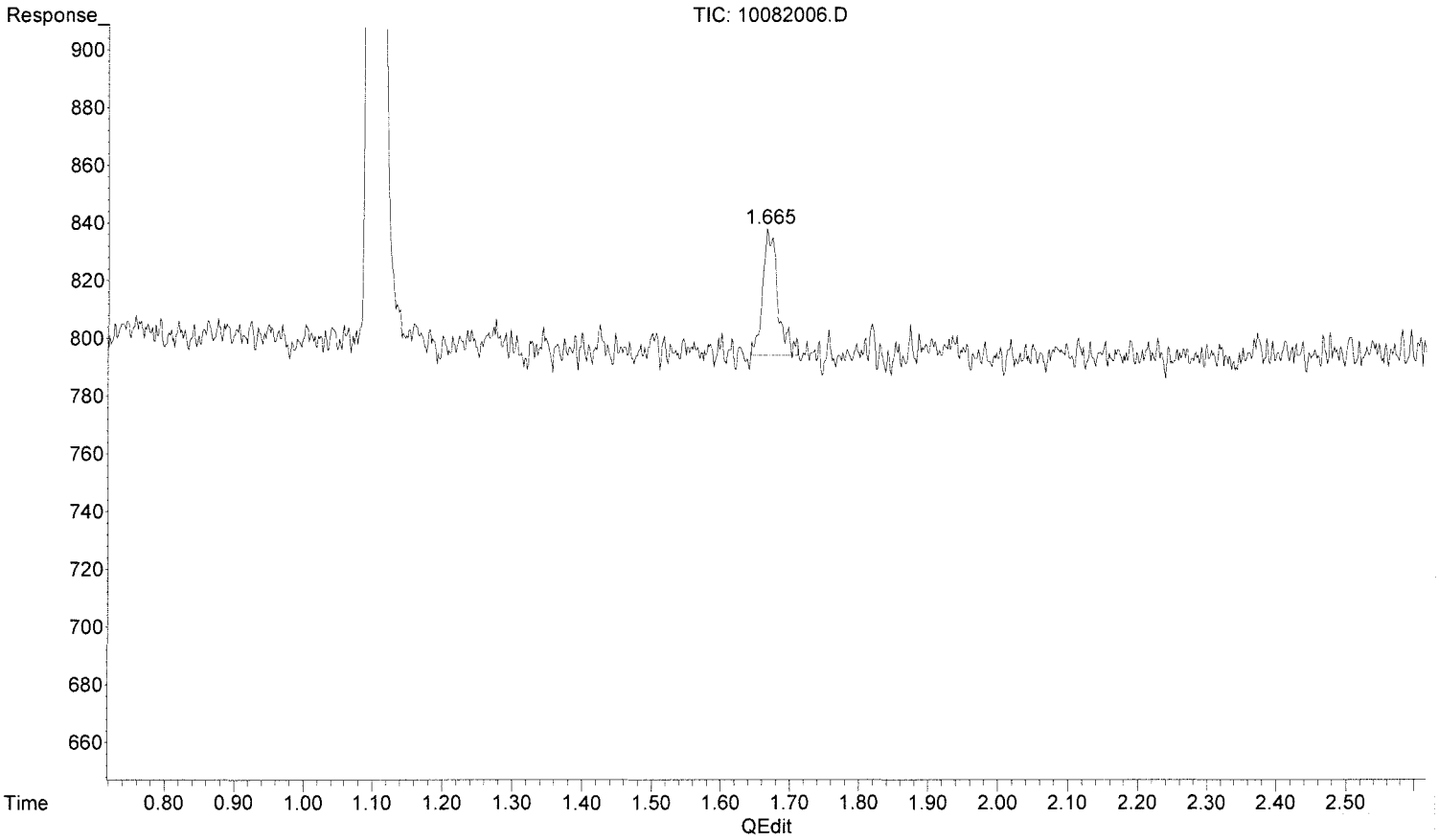
(+) = Expected Retention Time

01078944

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082006.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:53:36
Operator : WH
Sample : P2005613-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 13:04:43 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(7) Ethylene

1.665min 0.040 ppm m

response 663

MR 10/14/20

(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082007.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 13:02:07
Operator : WH
Sample : P2005613-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 14:09:46 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

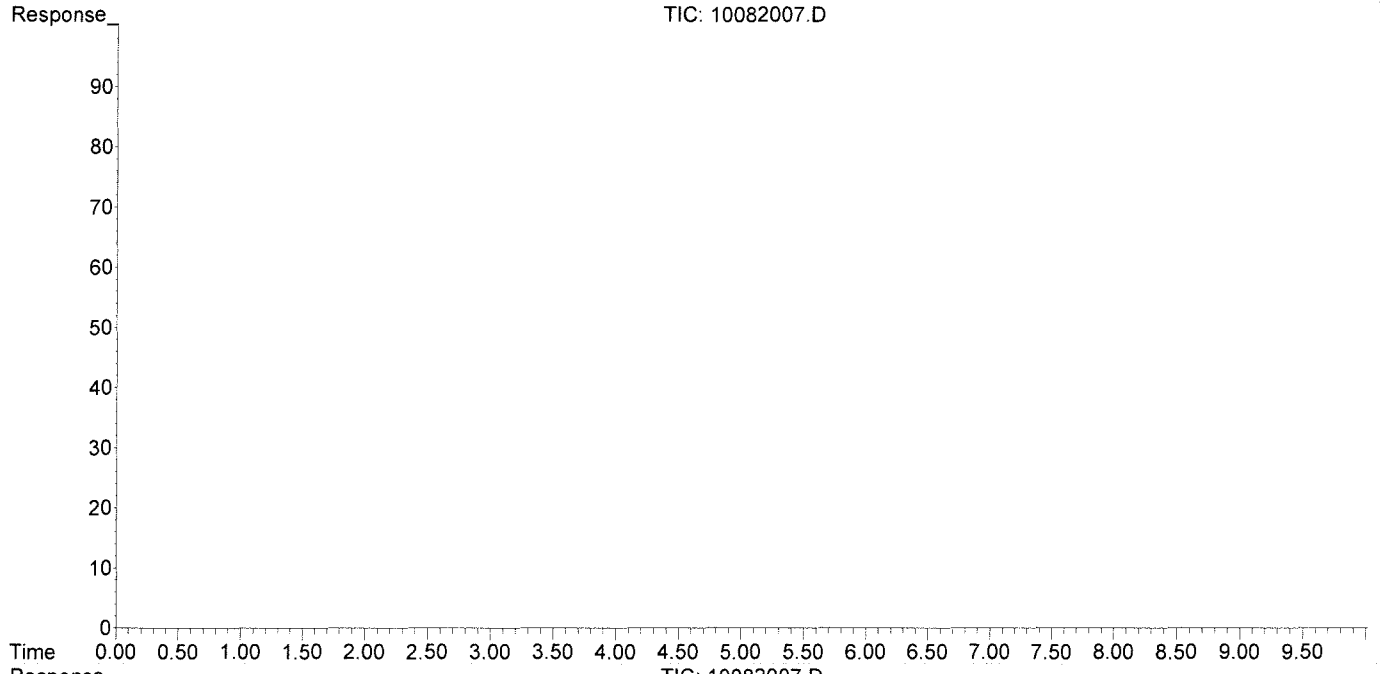
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.116	18334	2.021	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.739	5001	0.188	ppm
13)	n-Butane	6.739	5001	0.188	ppm

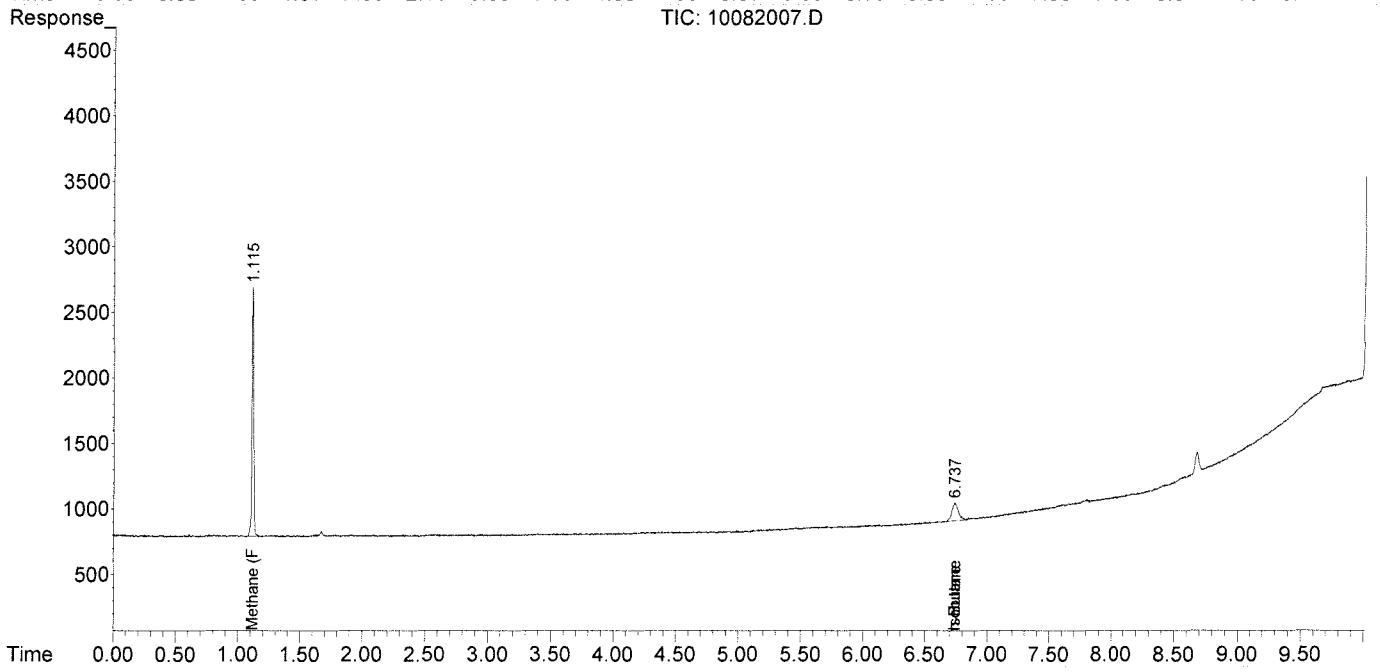
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082007.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 13:02:07
Operator : WH
Sample : P2005613-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 14:09:46 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082008.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 13:23:46
Operator : WH
Sample : P2005613-006 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 13:18:40 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

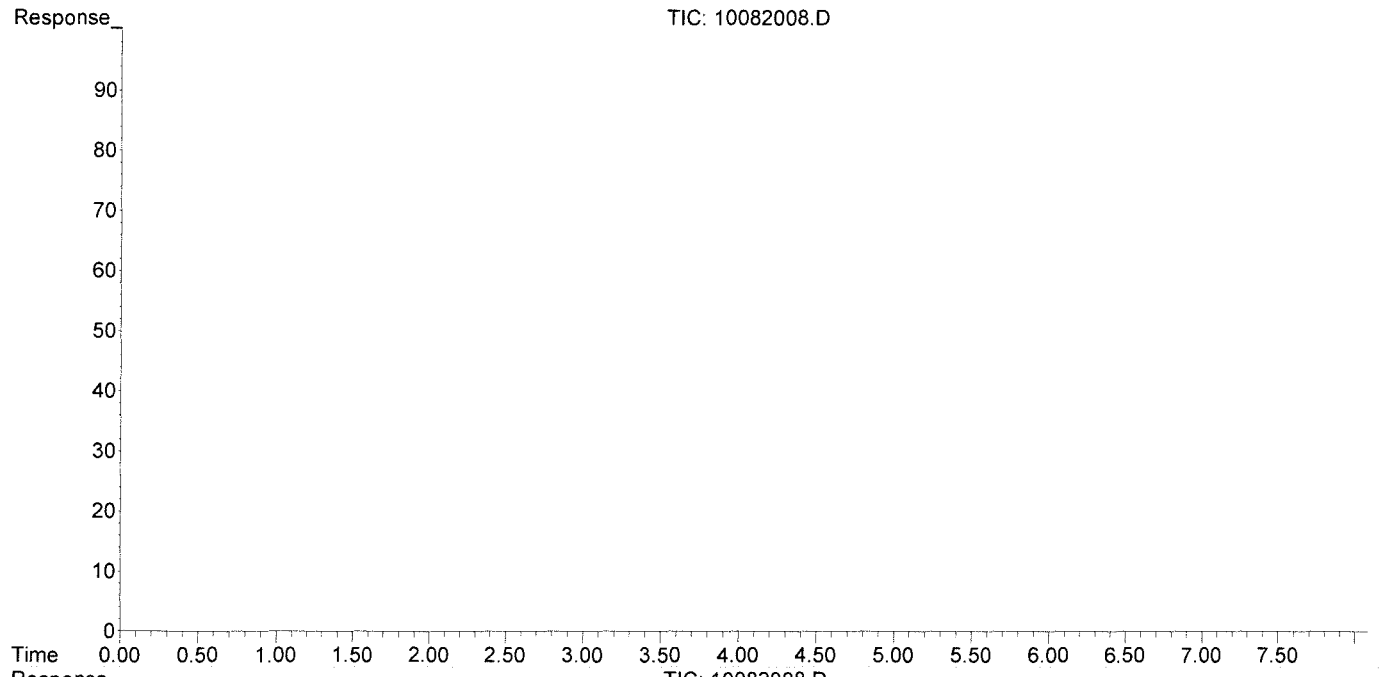
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.120	3970	0.438	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

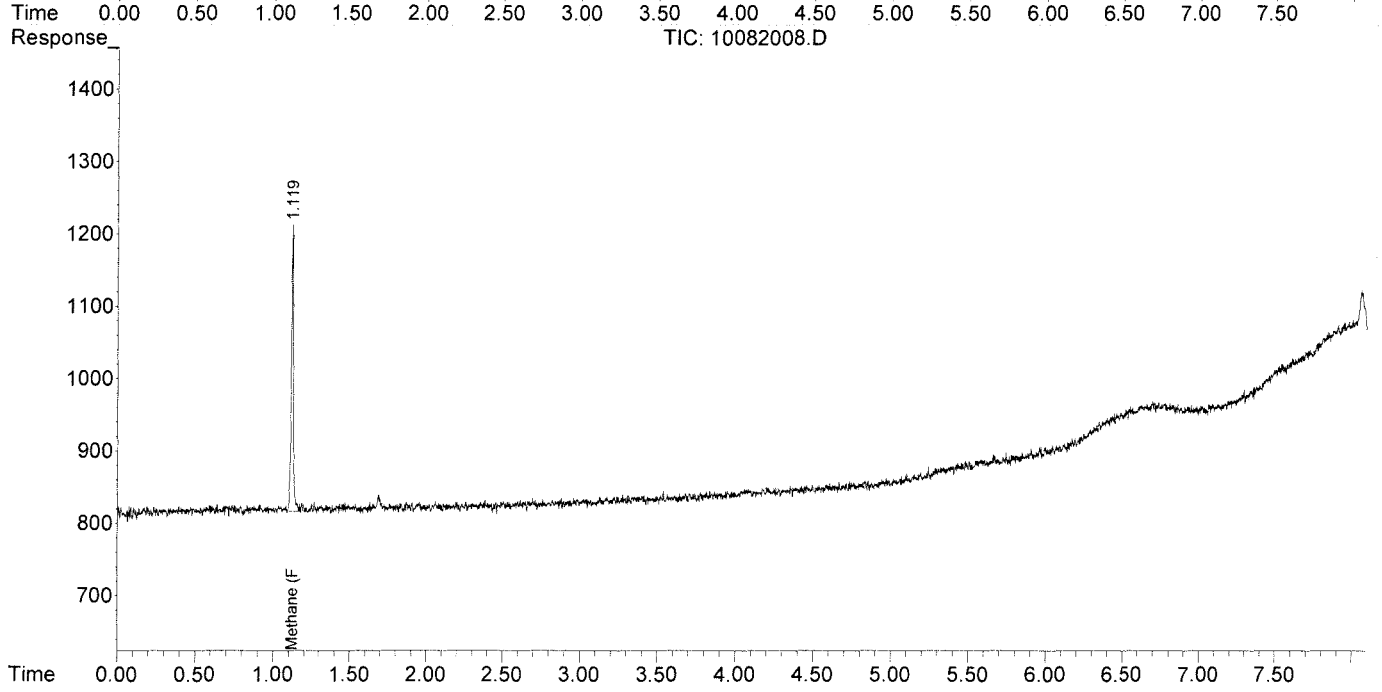
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082008.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 13:23:46
Operator : WH
Sample : P2005613-006 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 13:18:40 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082003.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:03:51
Operator : WH
Sample : mcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 12:53:46 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

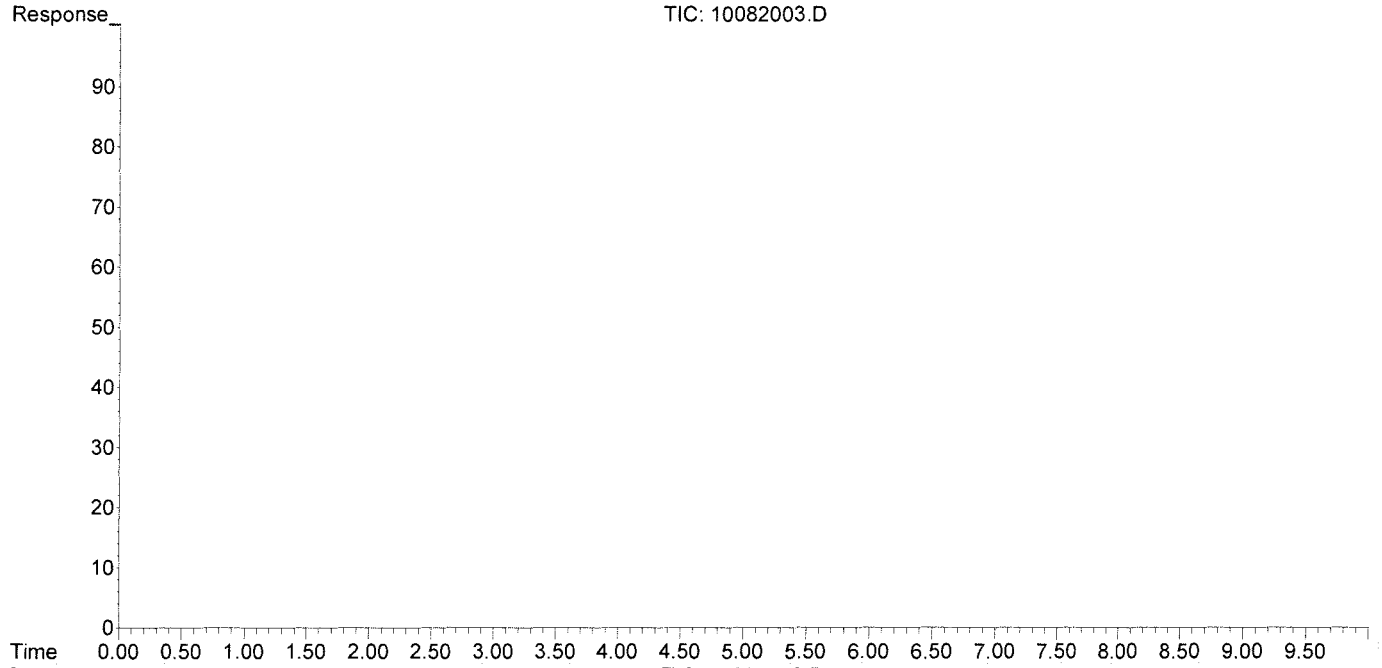
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.720	28150	1.058	ppm
13)	n-Butane	6.720	28150	1.058	ppm

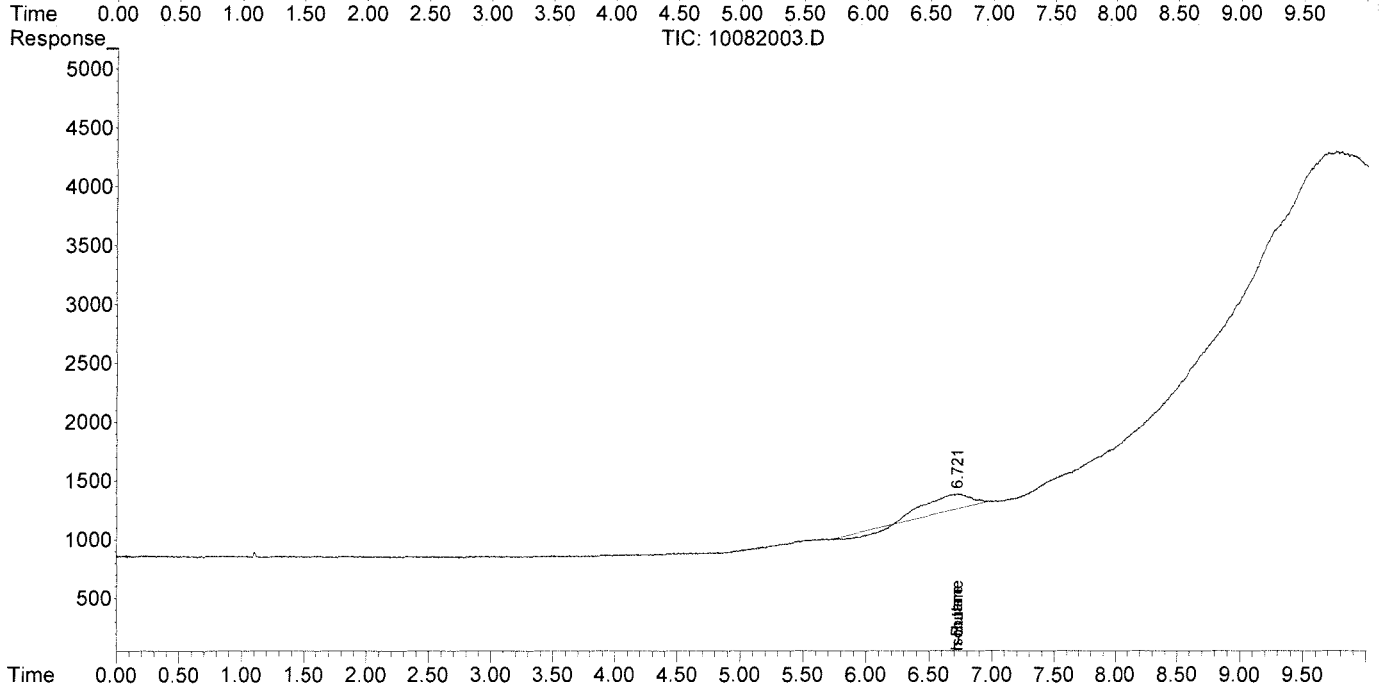
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082003.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 12:03:51
Operator : WH
Sample : mcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 14 12:53:46 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082012.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 14:31:22
Operator : WH
Sample : fid lcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 15:03:16 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

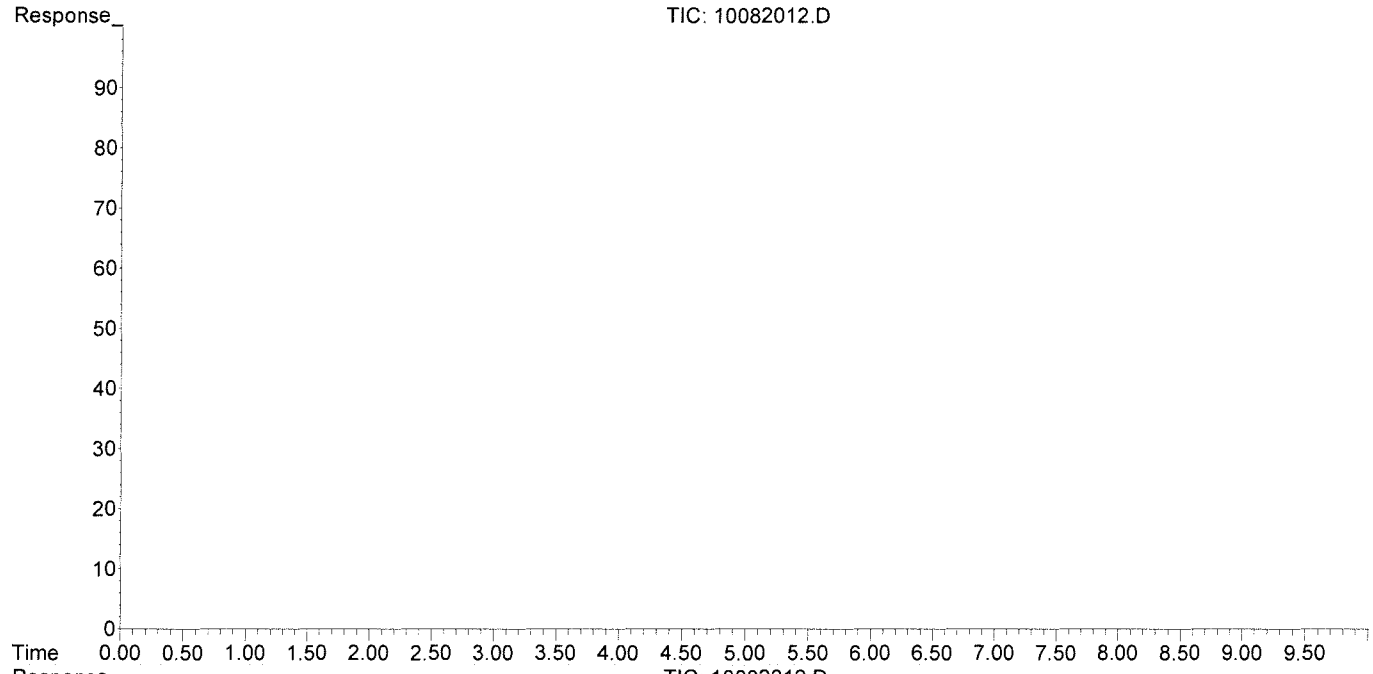
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.118	13367	1.474	ppm
7)	Ethylene	1.685	20418	1.220	ppm
8)	Ethane	1.948	22564	1.331	ppm
9)	Propylene	4.318	27877	1.190	ppm
10)	Propane	4.439	34219	1.375	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.643f	45572	1.712	ppm
13)	n-Butane	6.643f	45572	1.712	ppm

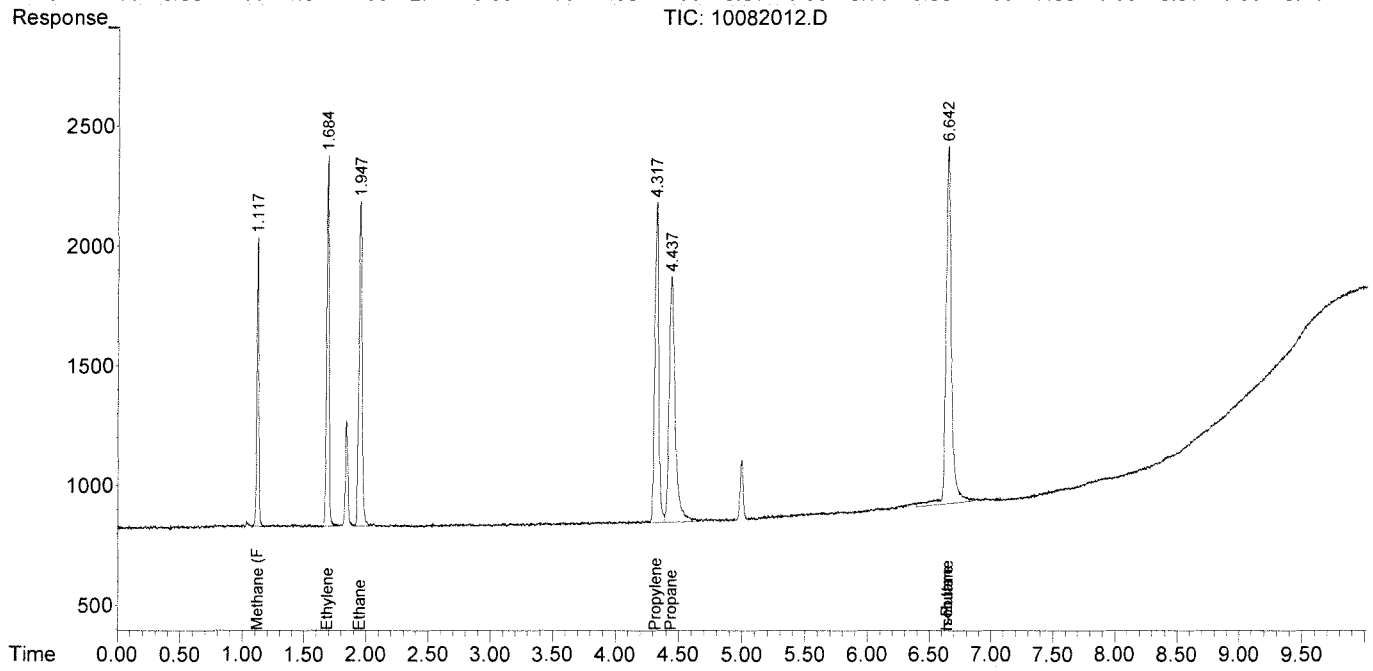
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082012.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 14:31:22
Operator : WH
Sample : fid lcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 15:03:16 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082013.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 15:03:59
Operator : WH
Sample : fid lcsd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 15:18:19 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

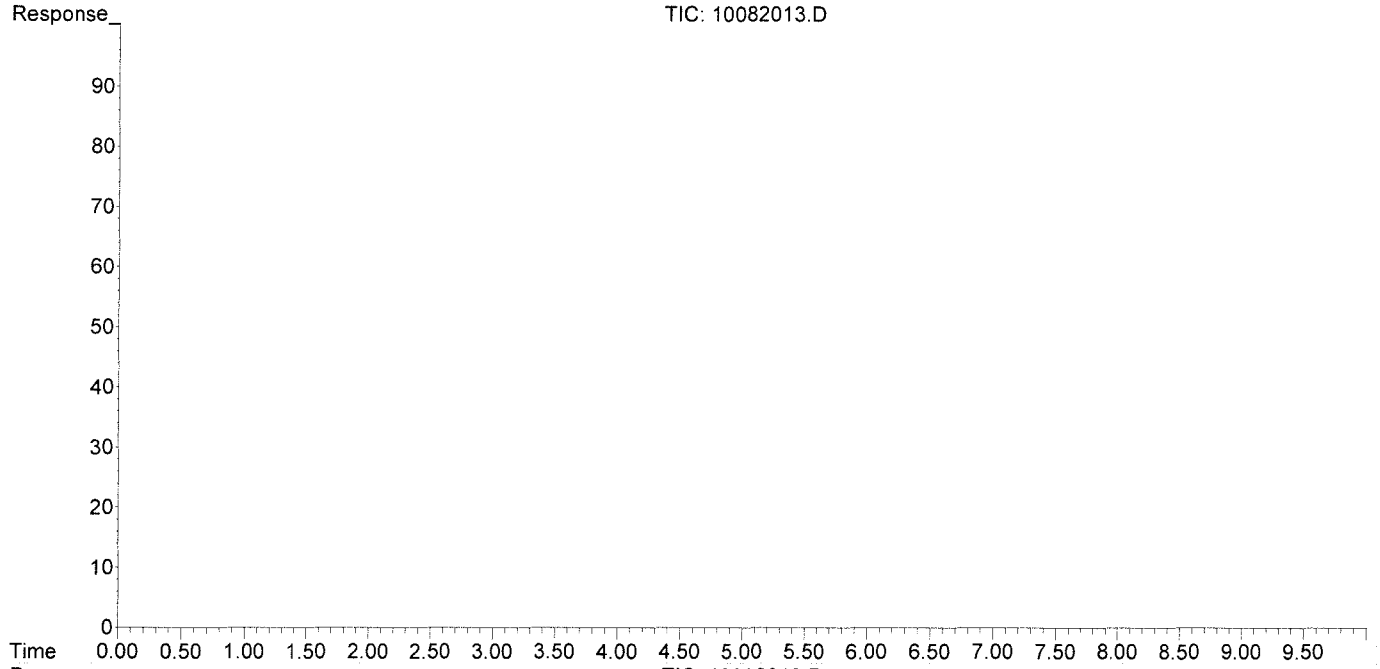
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.119	12263	1.352	ppm
7)	Ethylene	1.685	19015	1.136	ppm
8)	Ethane	1.947	21400	1.263	ppm
9)	Propylene	4.317	25395	1.084	ppm
10)	Propane	4.437	31486	1.265	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.643f	39877	1.498	ppm
13)	n-Butane	6.643f	39877	1.498	ppm

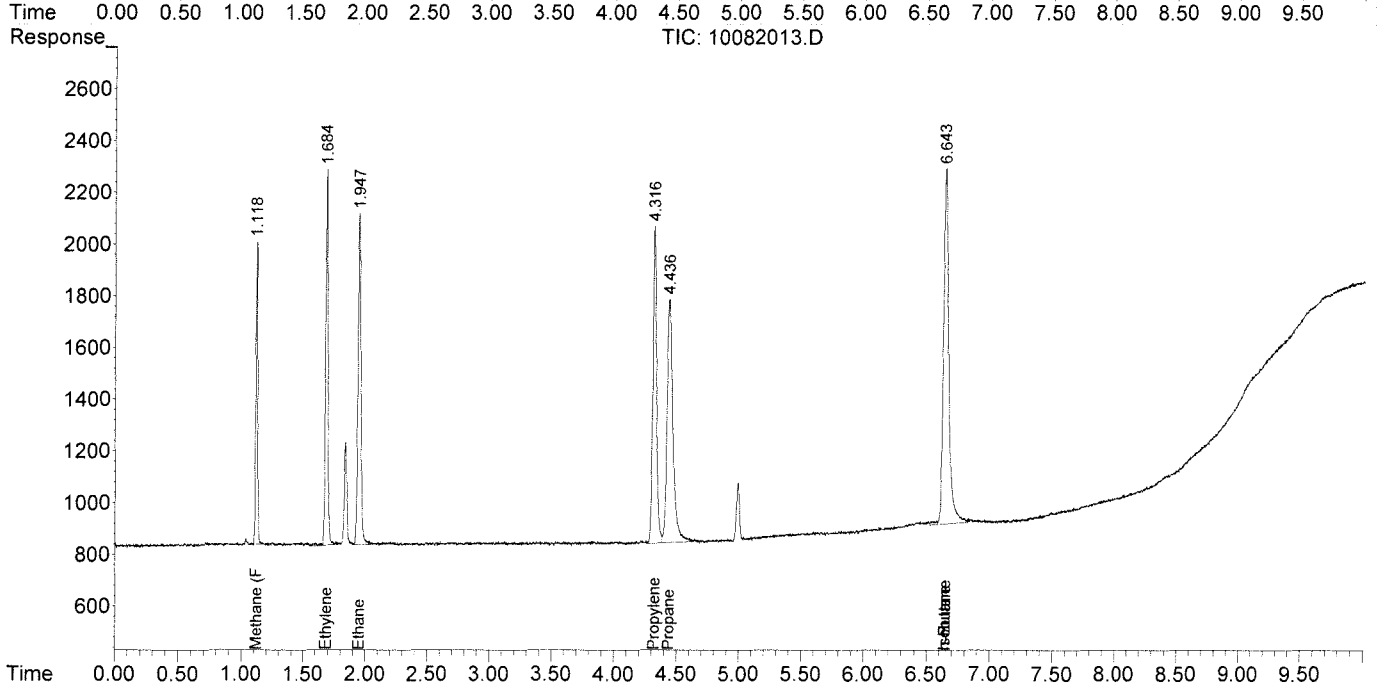
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082013.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 15:03:59
Operator : WH
Sample : fid lcsd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 15:18:19 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Response Factor Report HP5890

Method Path : J:\GC10\METHODS\
Method File : RS091217_R.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Wed Sep 13 11:14:47 2017
Response Via : Initial Calibration

Calibration Files
1 =09121702.D 2 =09121703.D 3 =09121704.D
4 =09121705.D 5 =09121706.D 6 =09121707.D

	Compound	1	2	3	4	5	6	Avg	%RSD
1)	Oxygen/Argon	3.739		1.014			0.001	0.793 E6	189.17
2)	Carbon monoxide	3.739		1.014			0.001	0.594 E6	221.92
3)	Methane (TCD)						2.161	0.951 E2	106.37
4)	Carbon dioxide	2.365	2.569	2.558	2.361	2.459	2.314	2.438 E2	4.44

Signal #2 Calibration Files
1 =09121702.D 2 =09121703.D 3 =09121704.D
4 =09121705.D 5 =09121706.D 6 =09121707.D

	Compound	1	2	3	4	5	6	Avg	%RSD
6)	Methane (FID)		1.180	0.975	0.908	0.870	0.868	0.907 E4	11.66
7)	Ethylene	1.736	1.638	1.780	1.720	1.628	1.670	1.673 E4	3.90
8)	Ethane	1.781	1.676	1.784	1.730	1.692	1.675	1.695 E4	3.83
9)	Propylene	2.505	2.296	2.592	2.480	2.346	2.252	2.343 E4	6.56
10)	Propane	2.439	2.283	2.645	2.555	2.433	2.522	2.488 E4	4.20
11)	Isobutylene							0.652 E1	138.46
12)	Isobutane	6.058	4.793	2.214	1.553	1.353		2.662 E4	86.17
13)	n-Butane	6.058	4.793	2.214	1.553	1.353		2.662 E4	86.17

(#) = Out of Range ### Number of calibration levels exceeded format ###

RS091217_R.M Wed Sep 13 15:11:48 2017

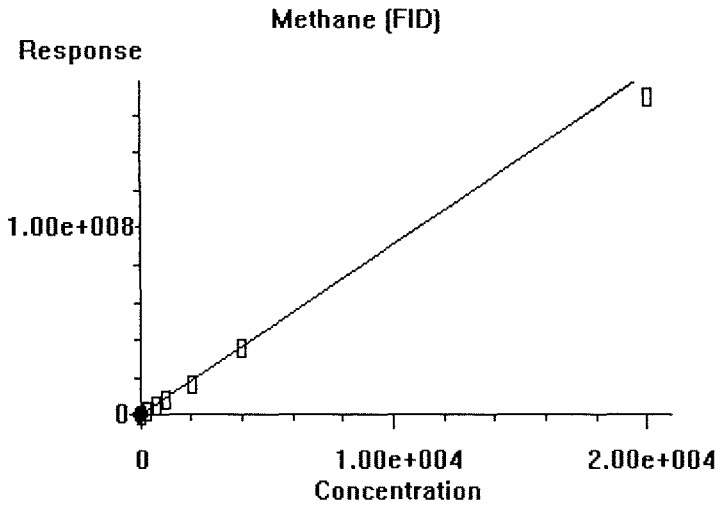
Edit Compounds -- Compound #6 -- Methane (FID)

Search by: Ret Time Name Index Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	
2	0.302000	3564.400000
3	1.510000	14725.268625
4	4.530000	41128.575000
5	10.570000	91966.784531
6	200.000000	1735997.497500
7	600.000000	5189848.900000
8	1000.000000	8598533.570000
9	2000.000000	16098209.390000
10	4000.000000	35776839.311362
11	20000.000000	169009160.49199



0.000e+000	Quadratic term
9.071e+003	Linear term
0.000e+000	Constant term
11.657%	RF Rel Std Dev

OK Cancel Help Print Calibration Curve Copy Calibration Curve

Edit Compounds -- Compound #7 -- Ethylene

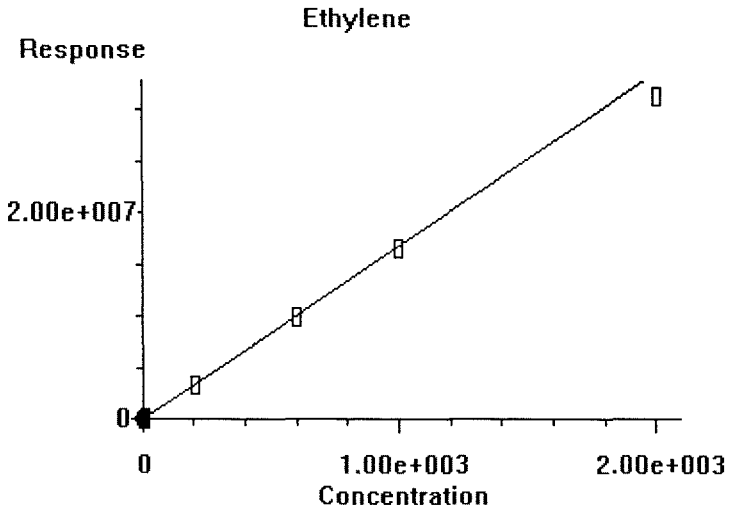
Search by: Ret Time | Name | Index — Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	2621.970000
2	0.302000	4946.731301
3	1.510000	26884.746847
4	4.530000	77902.721497
5	10.570000	172085.529560
6	200.000000	3339702.313219
7	600.000000	10007758.776971
8	1000.000000	16608503.805988
9	2000.000000	31192443.898600
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
1.673e+004	Linear term
0.000e+000	Constant term
3.897%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Edit Compounds -- Compound #8 -- Ethane

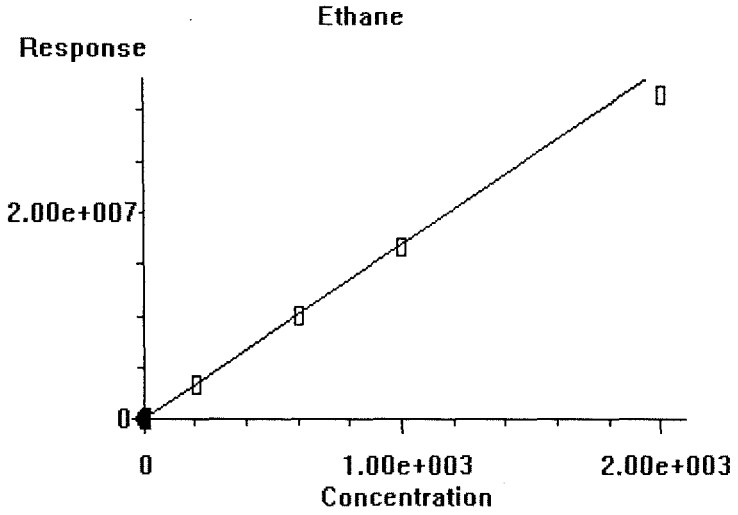
Search by: Ret Time | Name | Index — Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	2689.928008
2	0.302000	5060.331943
3	1.510000	26943.667500
4	4.530000	78353.525045
5	10.570000	178840.731148
6	200.000000	3350442.319129
7	600.000000	10048964.218029
8	1000.000000	16709164.879012
9	2000.000000	31424217.938900
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
1.695e+004	Linear term
0.000e+000	Constant term
3.831%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Edit Compounds -- Compound #9 -- Propylene

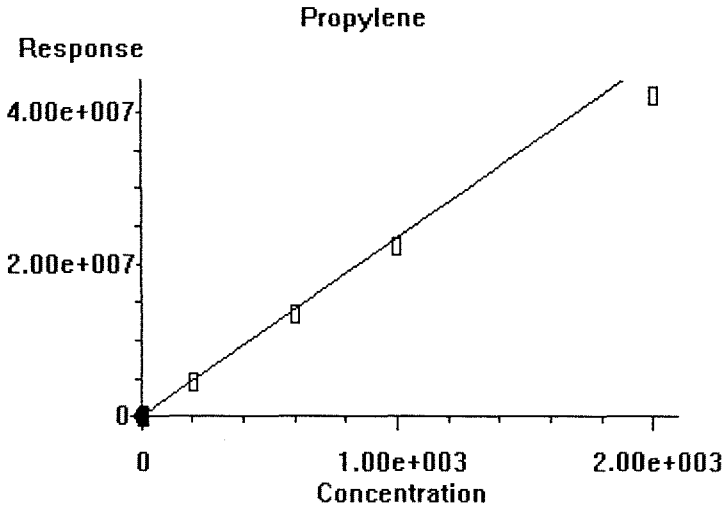
Search by: Ret Time | Name | Index — Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	3782.537646
2	0.302000	6933.285530
3	1.510000	39139.518208
4	4.530000	112341.896872
5	10.570000	248003.903623
6	200.000000	4504060.086084
7	600.000000	13569342.761419
8	1000.000000	22494887.720990
9	2000.000000	42124689.656800
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
2.343e+004	Linear term
0.000e+000	Constant term
6.559%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Edit Compounds -- Compound #10 -- Propane

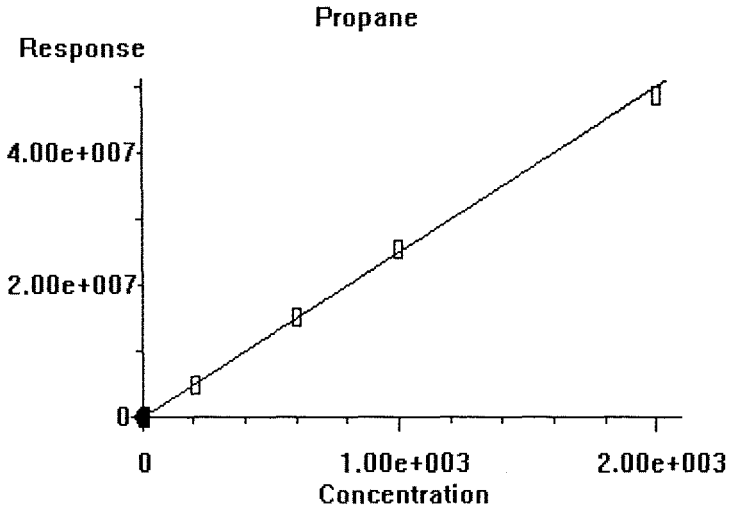
Search by: Ret Time | Name | Index | Find Compound

Compound Database
External Standard Compoun
- Oxygen/Argon
- Carbon monoxide
- Methane (TCD)
- Carbon dioxide
- Signal #2
- Methane (FID)
- Ethylene
- Ethane
- Propylene
- Propane
- Isobutylene
- Isobutane
- n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	3682.897354
2	0.302000	6894.237803
3	1.510000	39934.166792
4	4.530000	115723.428128
5	10.570000	257124.432806
6	200.000000	5043035.663916
7	600.000000	15251325.797404
8	1000.000000	25459410.657938
9	2000.000000	48583085.287451
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
2.488e+004	Linear term
0.000e+000	Constant term
4.200%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Calibration Status Report HP5890

Method Path : J:\GC10\METHODS\
Method File : RS091217_R.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Wed Sep 13 11:14:47 2017
Response Via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	1	0	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121702.D
2	2	0	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121703.D
3	3	3	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121704.D
4	4	10	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121705.D
5	5	25	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121706.D
6	6	125	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121707.D
7	7	5000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121708.D
8	8	25000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121709.D
9	9	2000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121710.D
10	10	30000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121711.D
11	11	20000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121712.D

#	ID	Update Time	Quant Time	Acquisition Time
1	1	Sep 13 11:04 2017	Sep 12 15:03 2017	12-Sep-2017, 10:52
2	2	Sep 13 11:05 2017	Sep 13 11:05 2017	12-Sep-2017, 11:05
3	3	Sep 13 11:06 2017	Sep 13 11:05 2017	12-Sep-2017, 11:45
4	4	Sep 13 11:09 2017	Sep 13 11:06 2017	12-Sep-2017, 12:09
5	5	Sep 13 11:09 2017	Sep 13 11:09 2017	12-Sep-2017, 12:30
6	6	Sep 13 11:10 2017	Sep 13 11:10 2017	12-Sep-2017, 12:47
7	7	Sep 13 11:11 2017	Sep 13 11:10 2017	12-Sep-2017, 13:00
8	8	Sep 13 11:12 2017	Sep 13 11:11 2017	12-Sep-2017, 13:47
9	9	Sep 13 11:12 2017	Sep 13 11:12 2017	12-Sep-2017, 14:07
10	10	Sep 13 11:14 2017	Sep 13 11:13 2017	12-Sep-2017, 14:48
11	11	Sep 13 11:14 2017	Sep 13 11:14 2017	12-Sep-2017, 15:21

RS091217_R.M Wed Sep 13 15:11:22 2017

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121702.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 10:52
Operator : MC
Sample : 0.151ppm 0.250ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 12 11:03:15 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.767	373920	0.128	ppm	
2)	Carbon monoxide	1.767	373920	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	1.595	2622	0.156	ppm	
8)	Ethane	1.848	2690	0.156	ppm	
9)	Propylene	4.222	3783	0.154	ppm	
10)	Propane	4.348	3683	0.139	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.582f	6058	NoCal	ppm	
13)	n-Butane	6.582f	6058	NoCal	ppm	

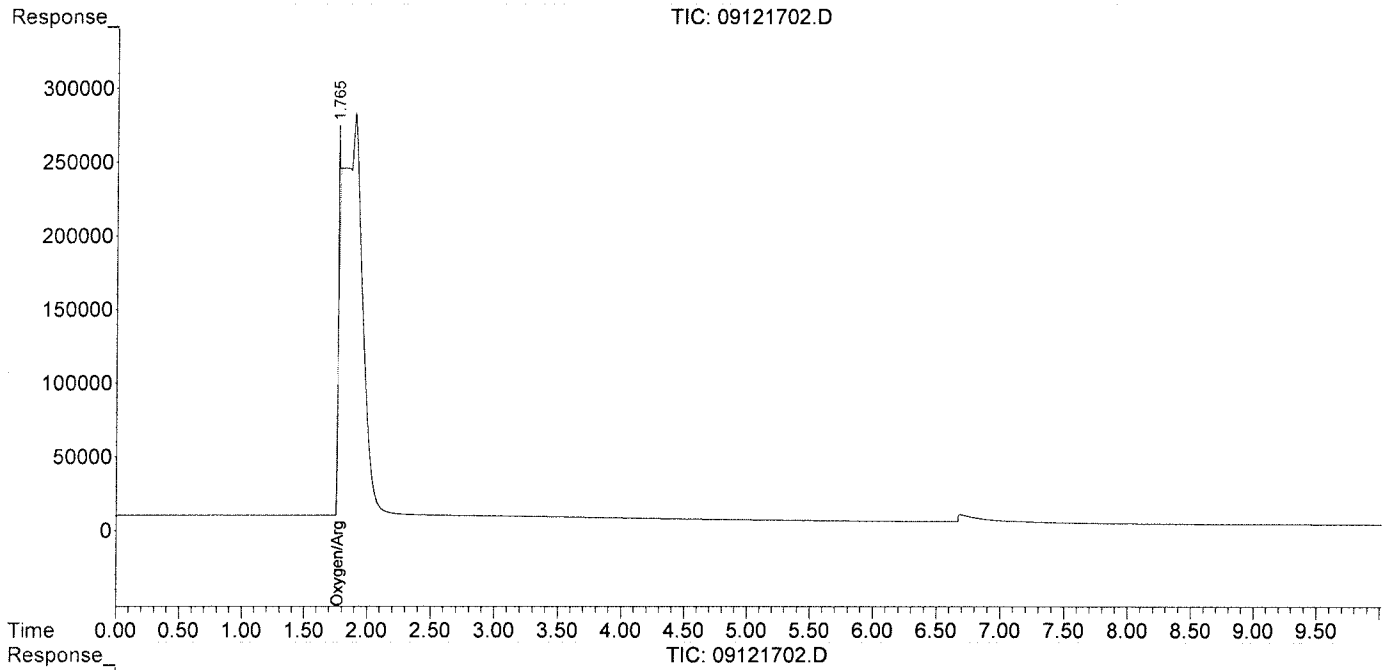
(f)=RT Delta > 1/2 Window (m)=manual int.

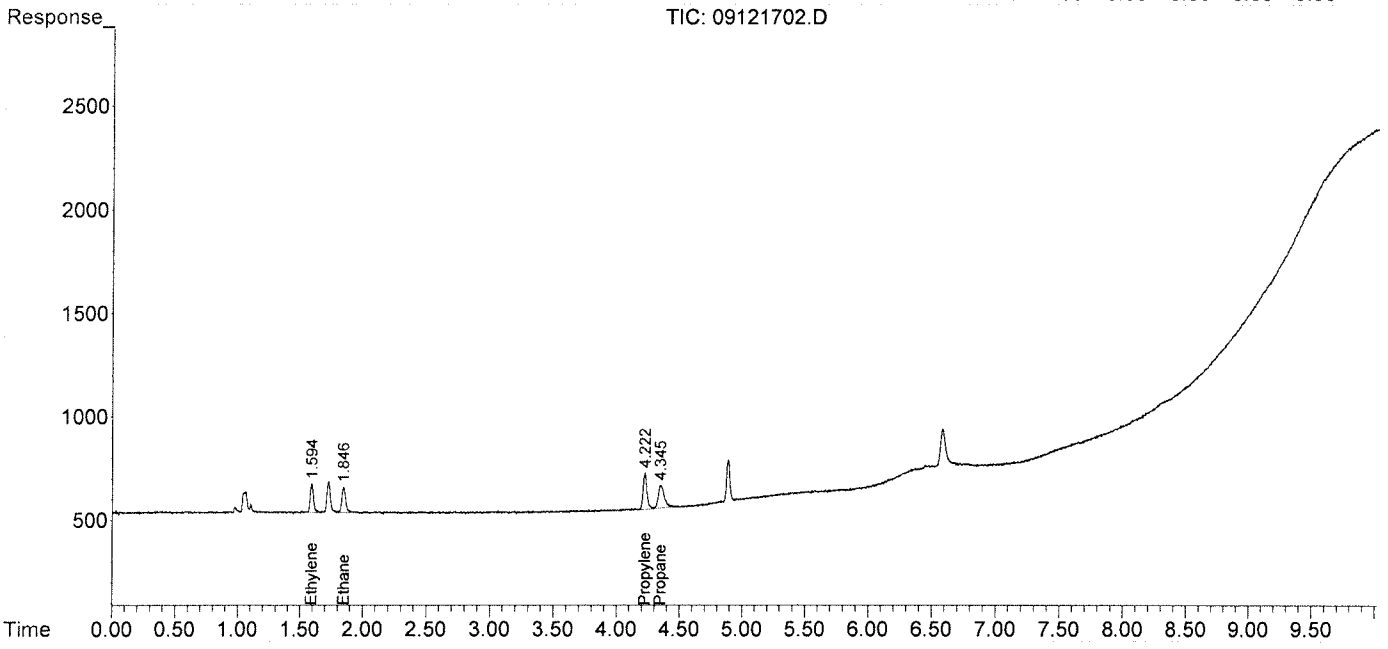
9/13/17

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121702.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 10:52
Operator : MC
Sample : 0.151ppm 0.250ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 12 11:03:15 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

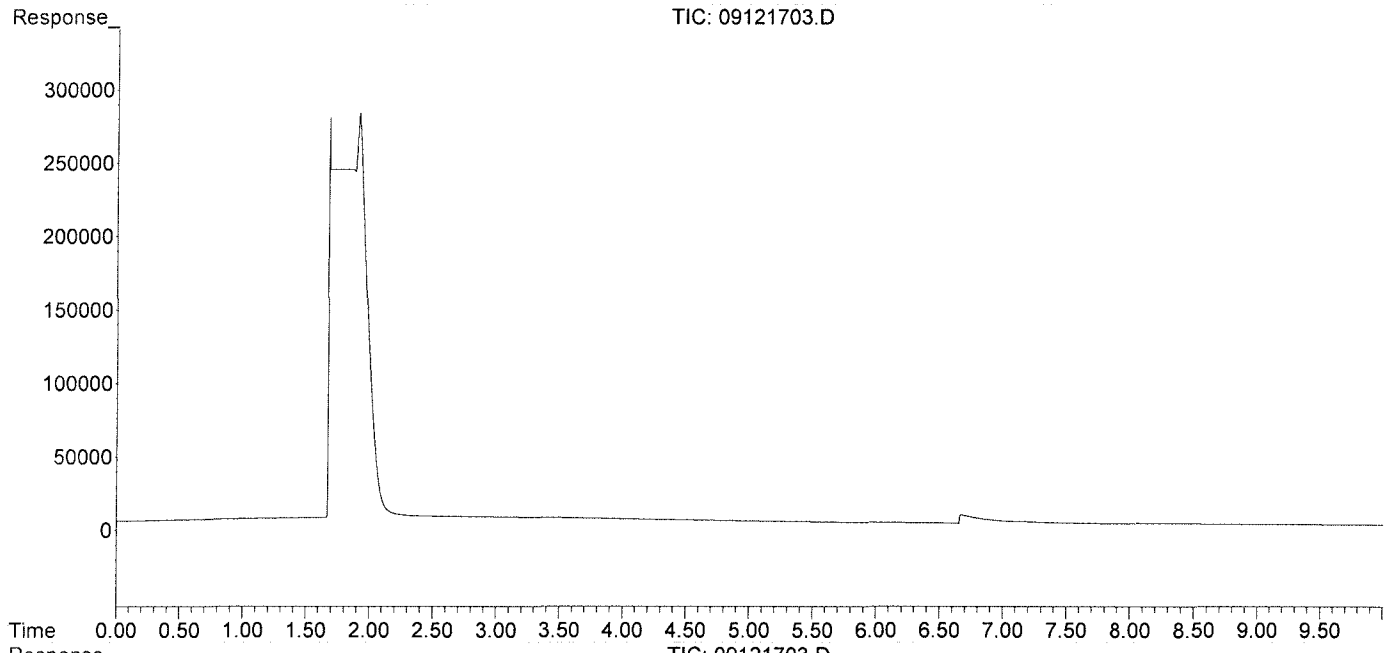
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.913f	-25181981	N.D.	ppm	
2)	Carbon monoxide	1.913f	-25181981	1.089	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.049	3564	0.391	ppm	m
7)	Ethylene	1.577	4947	0.292	ppm	
8)	Ethane	1.828	5060	0.293	ppm	
9)	Propylene	4.207	6933	0.281	ppm	
10)	Propane	4.337	6894	0.268	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.579f	9587	0.158	ppm	
13)	n-Butane	6.579f	9587	0.158	ppm	

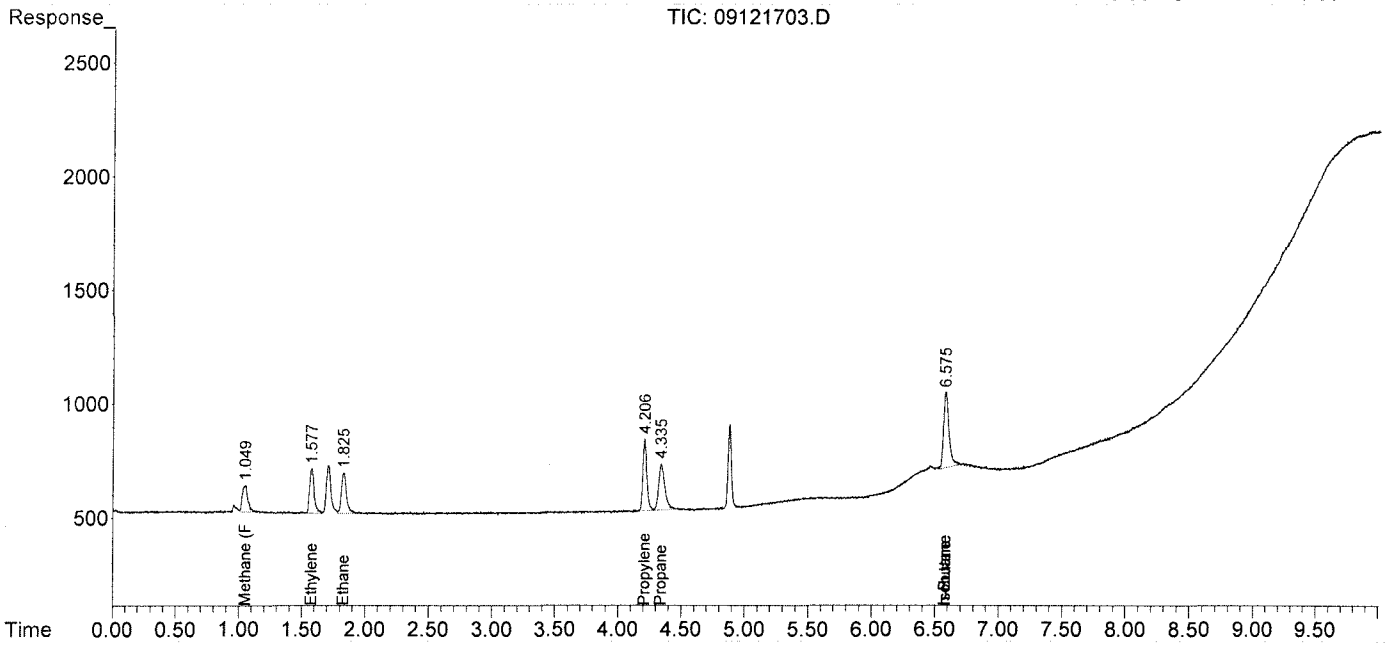
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



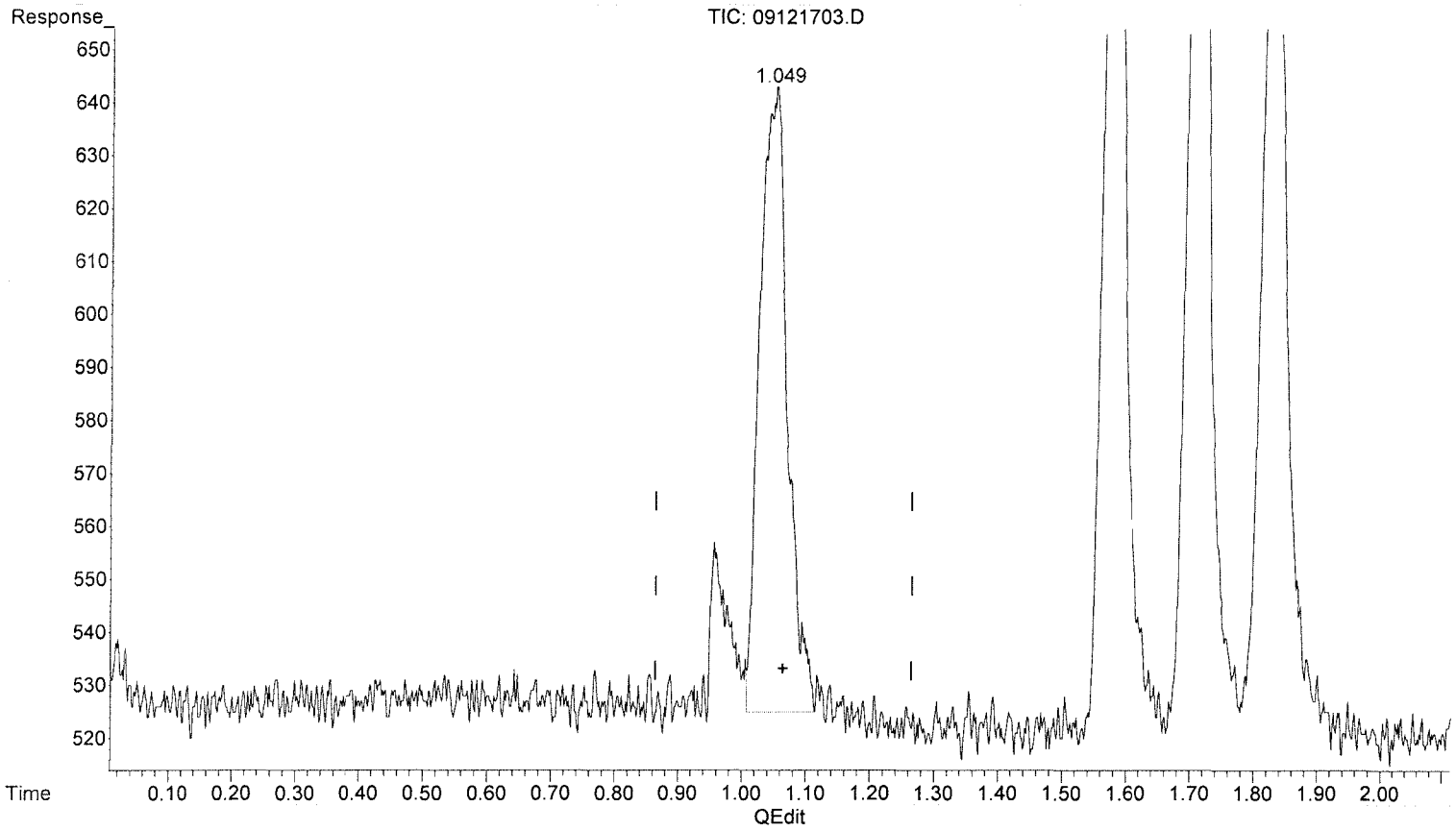


01078966

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)

1.049min 0.391 ppm m

response 3564

(+) = Expected Retention Time

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121704.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:45
Operator : MC
Sample : 1.51ppm 0.1ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:55 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc Units
Target Compounds				
1)	Oxygen/Argon	1.847	2536230	1.056 ppm
2)	Carbon monoxide	1.847	2536230	N.D. ppm
3)	Methane (TCD)	0.000	0	N.D. ppm
4)	Carbon dioxide	0.000	0	N.D. ppm
6)	Methane (FID)	1.064	14725	1.613 ppm
7)	Ethylene	1.598	26885	1.582 ppm
8)	Ethane	1.851	26944	1.555 ppm
9)	Propylene	4.220	39140	1.589 ppm
10)	Propane	4.349	39934	1.596 ppm
11)	Isobutylene	0.000	0	N.D. ppm
12)	Isobutane	6.578f	55348	1.020 ppm
13)	n-Butane	6.578f	55348	1.020 ppm

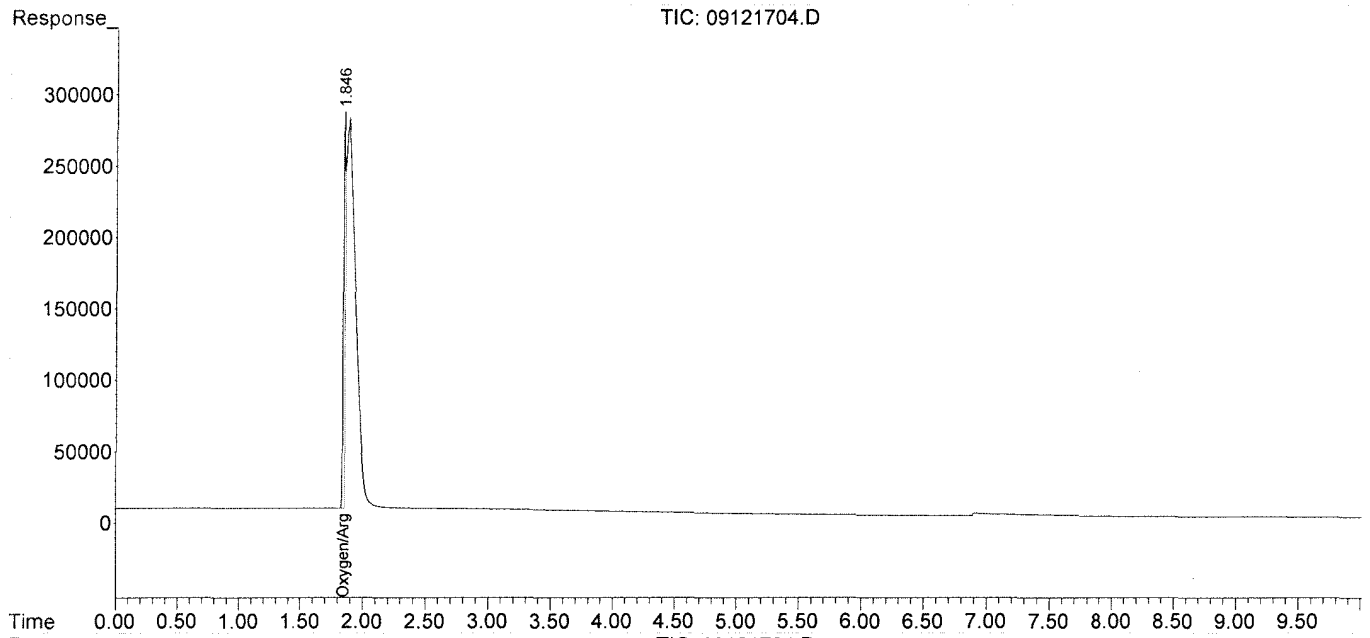
(f)=RT Delta > 1/2 Window (m)=manual int.

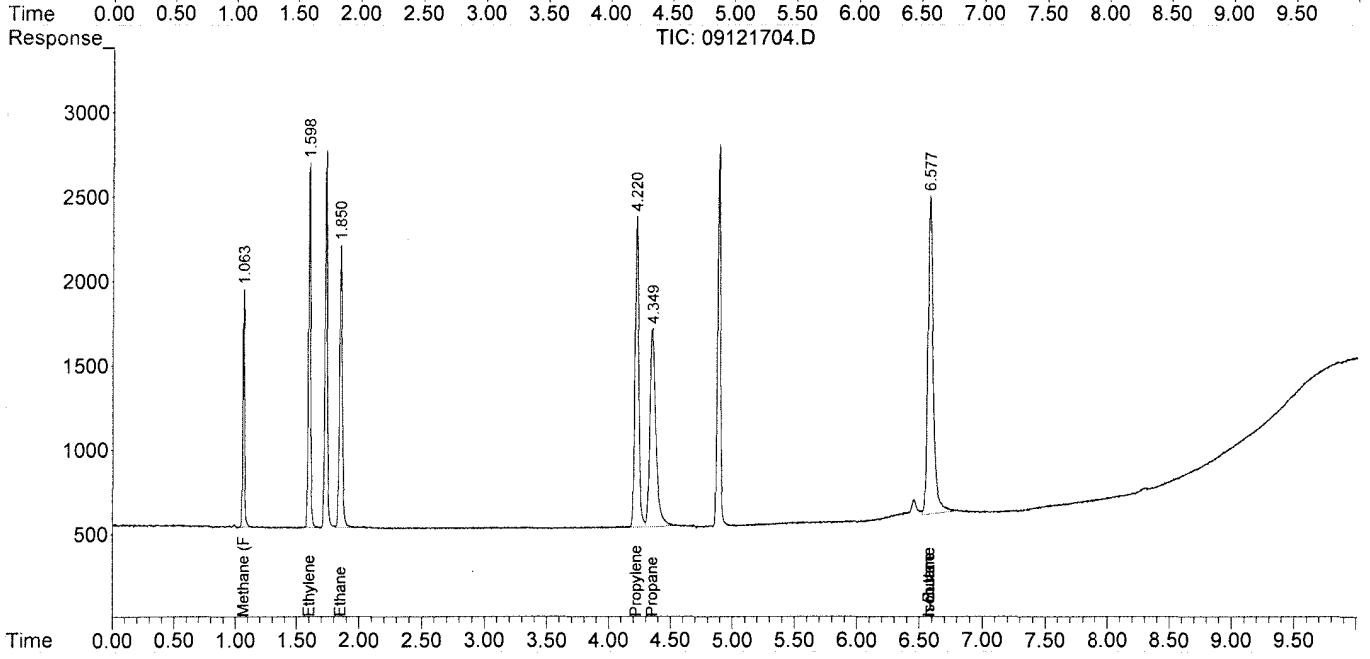
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121704.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:45
Operator : MC
Sample : 1.51ppm 0.1ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:55 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121705.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:09
Operator : MC
Sample : 4.53ppm 0.3ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:06:32 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

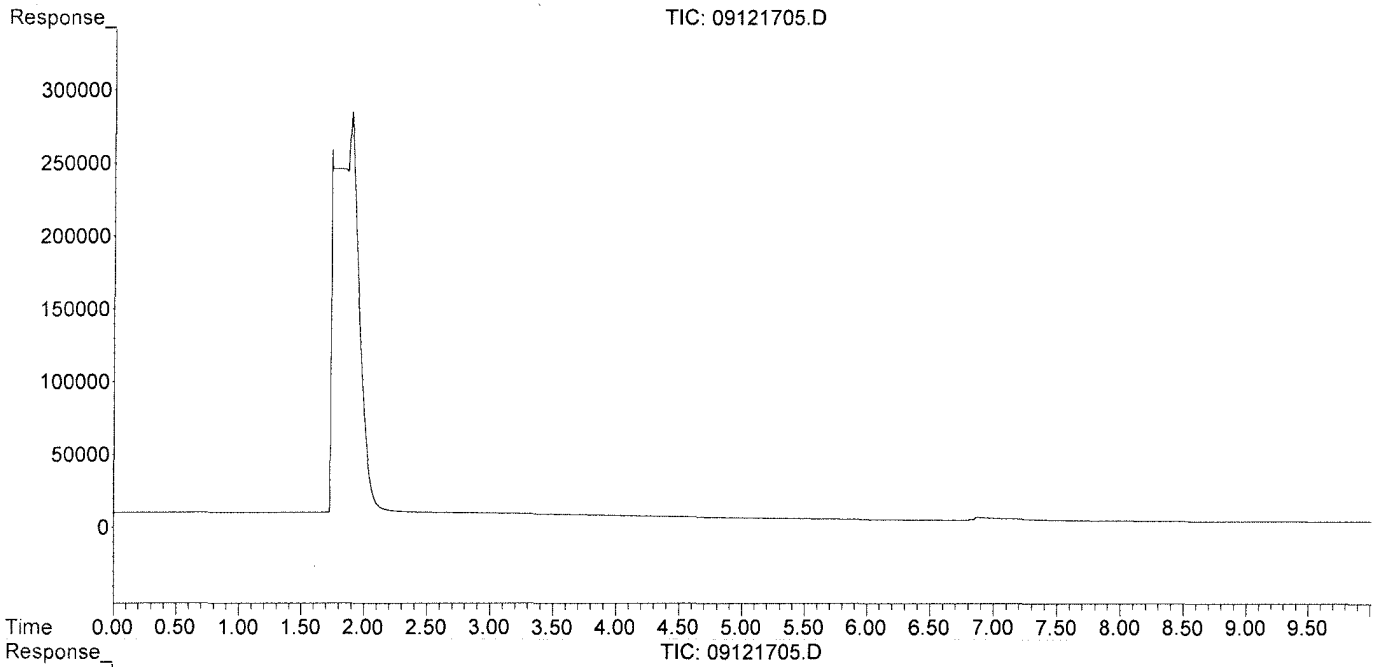
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.738	-331216	N.D.	ppm
2)	Carbon monoxide	1.738	-331216	0.019	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.052	41129	4.522	ppm
7)	Ethylene	1.586	77903	4.637	ppm
8)	Ethane	1.838	78354	4.558	ppm
9)	Propylene	4.218	112342	4.614	ppm
10)	Propane	4.347	115723	4.680	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.580f	155256	3.565	ppm
13)	n-Butane	6.580f	155256	3.565	ppm

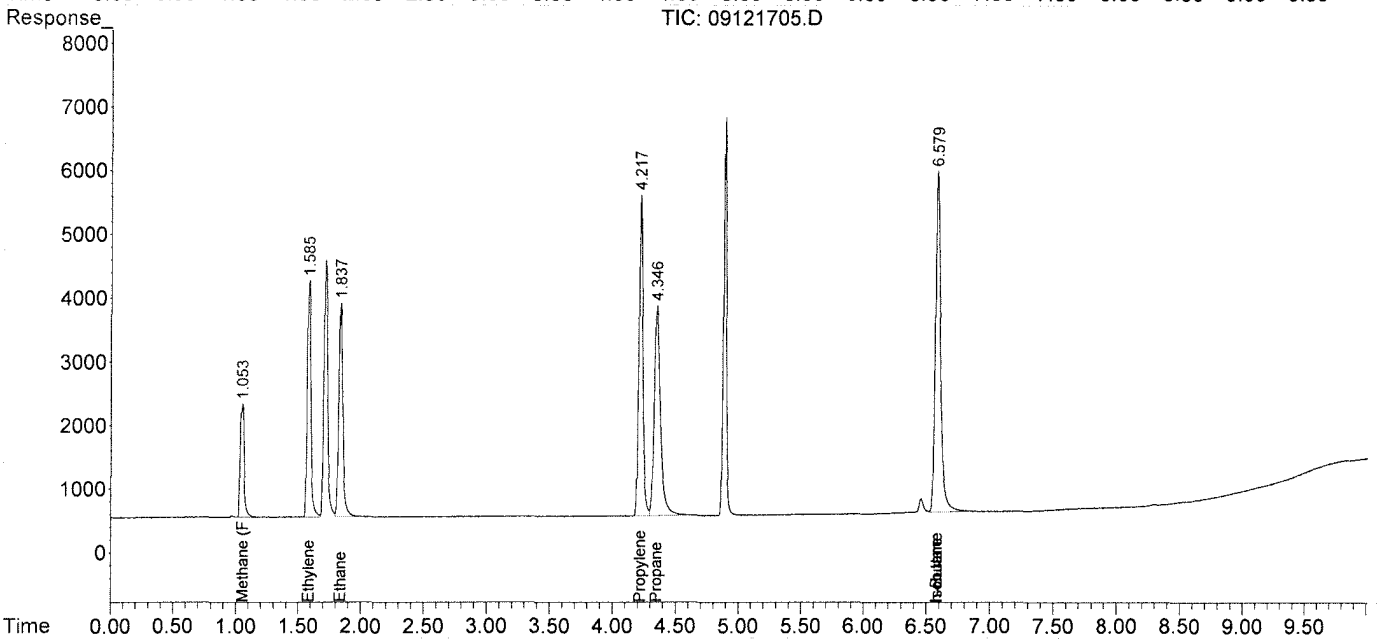
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121705.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:09
Operator : MC
Sample : 4.53ppm 0.3ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:06:32 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121706.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:30
Operator : MC
Sample : 10.57ppm 0.7ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:24 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

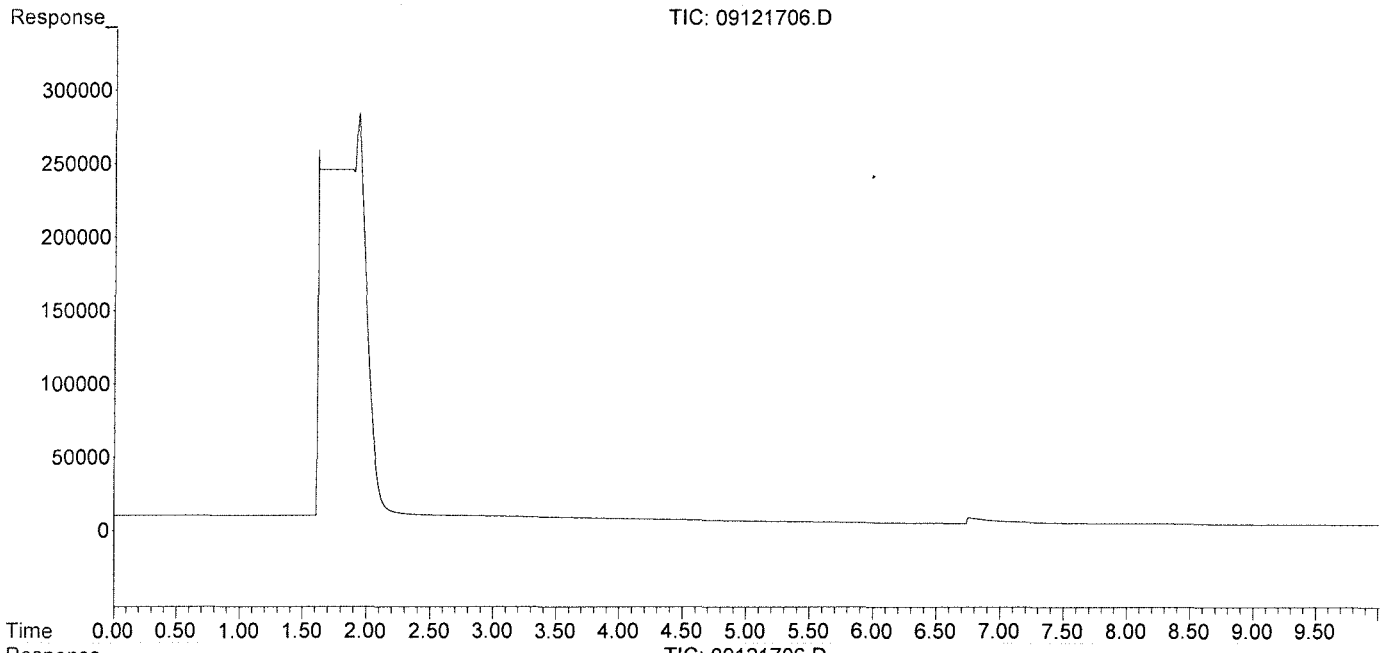
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.929f	-31871242	N.D.	ppm
2)	Carbon monoxide	1.929f	-31871242	1.818	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.025	91967	10.135	ppm
7)	Ethylene	1.568	172086	10.273	ppm
8)	Ethane	1.822	178841	10.441	ppm
9)	Propylene	4.214	248004	10.236	ppm
10)	Propane	4.344	257124	10.458	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.578f	338181	9.254	ppm
13)	n-Butane	6.578f	338181	9.254	ppm

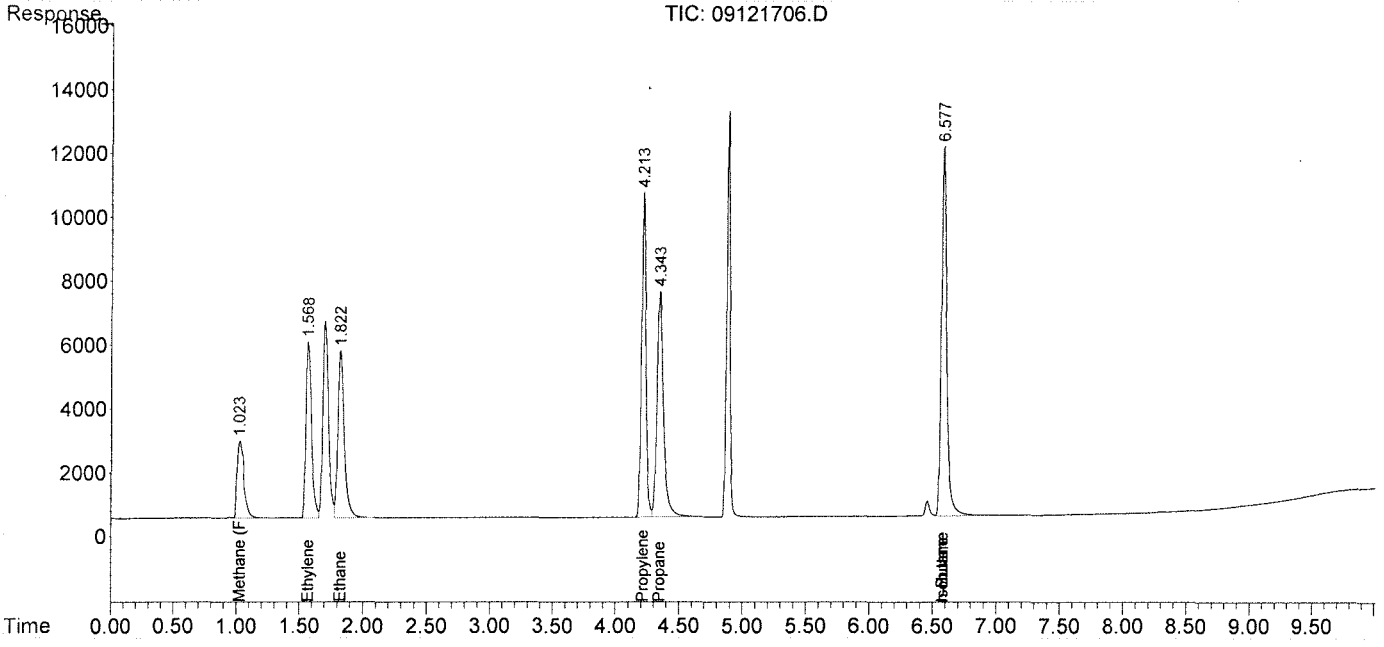
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121706.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:30
Operator : MC
Sample : 10.57ppm 0.7ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:24 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121707.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:47
Operator : MC
Sample : 200ppm 0.1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:59 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

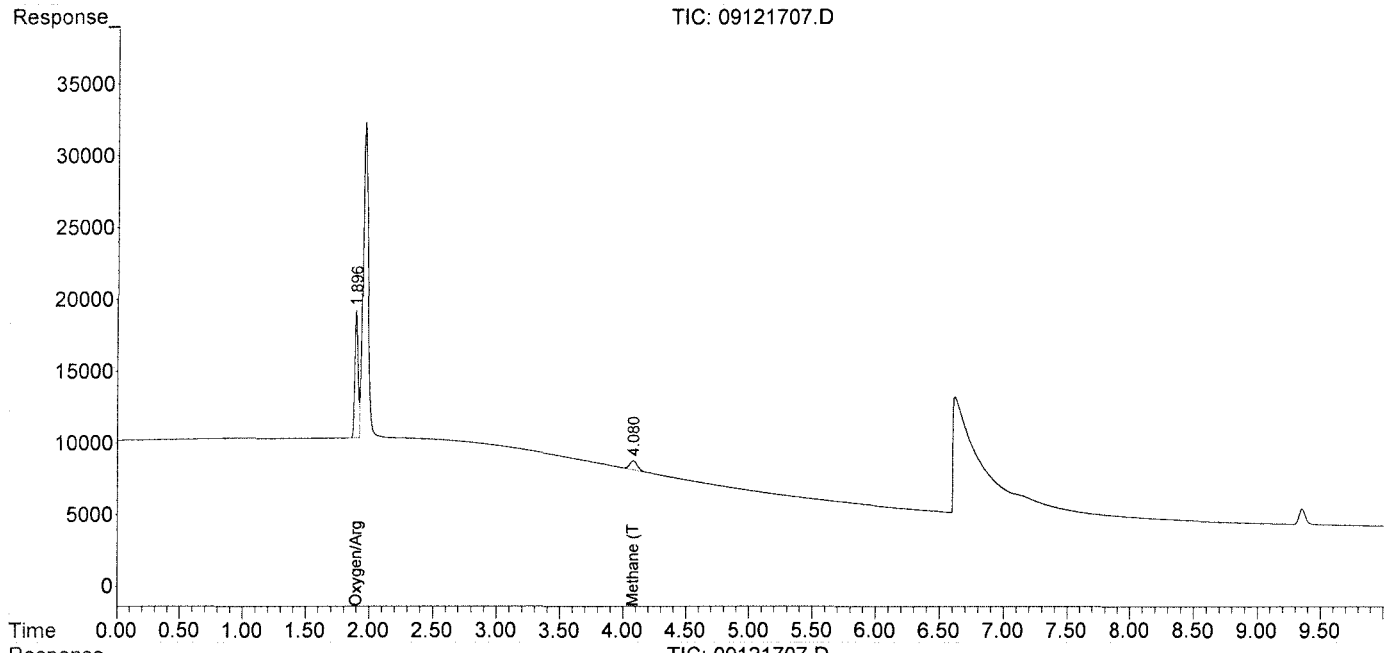
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.897	155286	0.065	ppm
2)	Carbon monoxide	1.897	155286	N.D.	ppm
3)	Methane (TCD)	4.079f	27015	2856.472	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.063	1735997	190.792	ppm
7)	Ethylene	1.597	3339702	198.758	ppm
8)	Ethane	1.849	3350442	194.597	ppm
9)	Propylene	4.201	4504060	185.706	ppm
10)	Propane	4.333	5043036	204.809	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

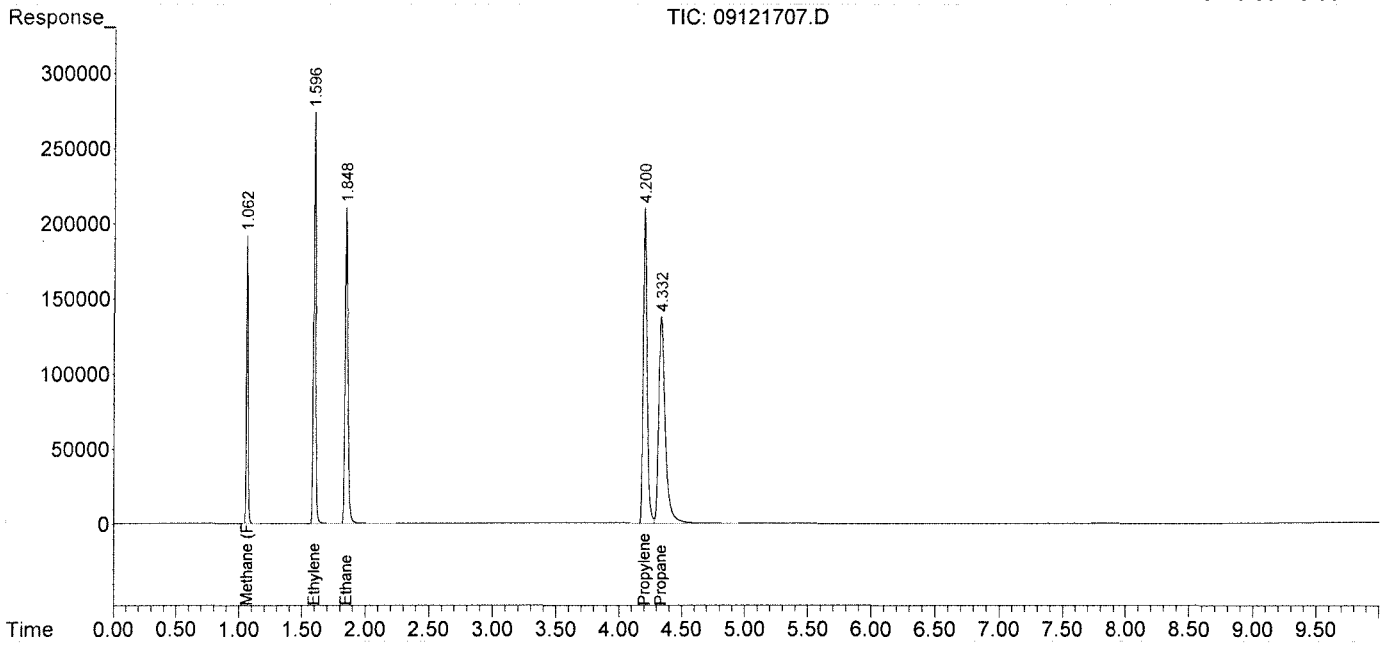
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121707.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:47
Operator : MC
Sample : 200ppm 0.1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:59 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121708.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:00
Operator : MC
Sample : 600ppm 0.3ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:10:57 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:10:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

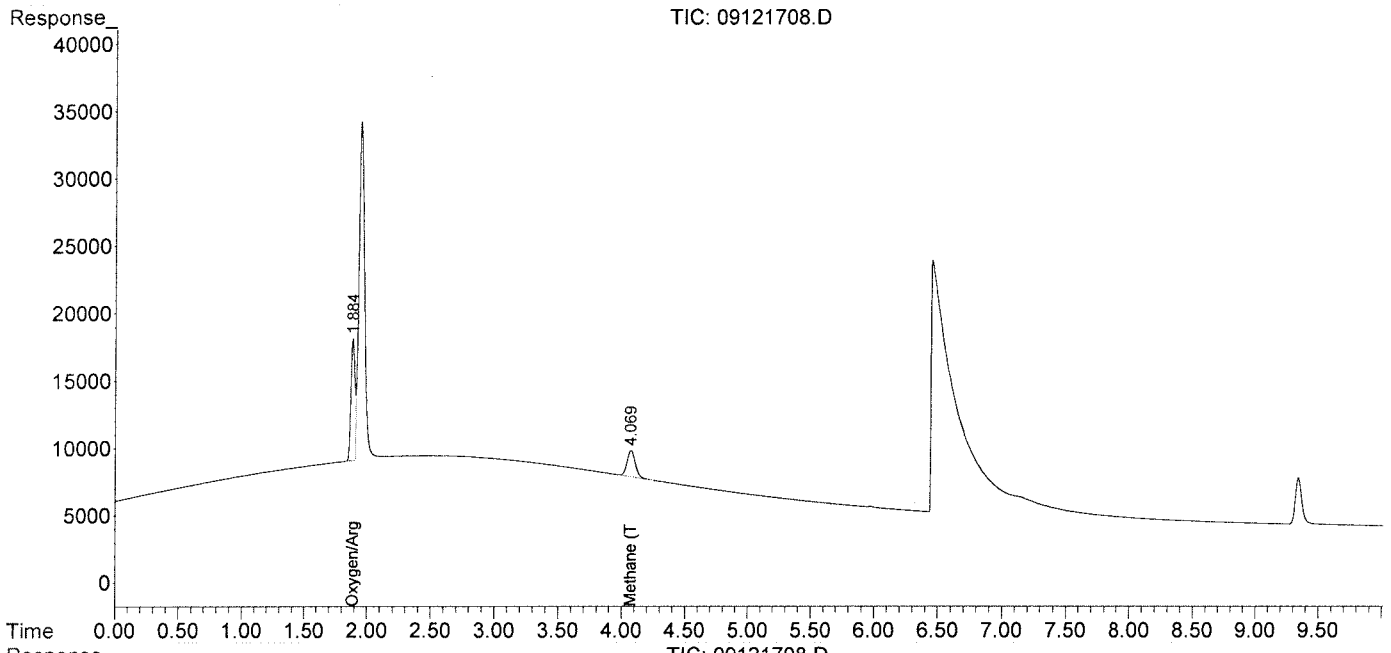
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.884	196022	0.124	ppm
2)	Carbon monoxide	1.884	196022	N.D.	ppm
3)	Methane (TCD)	4.070f	88282	782.730	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.044	5189849	539.759	ppm
7)	Ethylene	1.573	10007759	590.286	ppm
8)	Ethane	1.822	10048964	583.213	ppm
9)	Propylene	4.160	13569343	562.612	ppm
10)	Propane	4.300	15251326	615.171	ppm
11)	Isobutylene	6.143	9815	NoCal	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

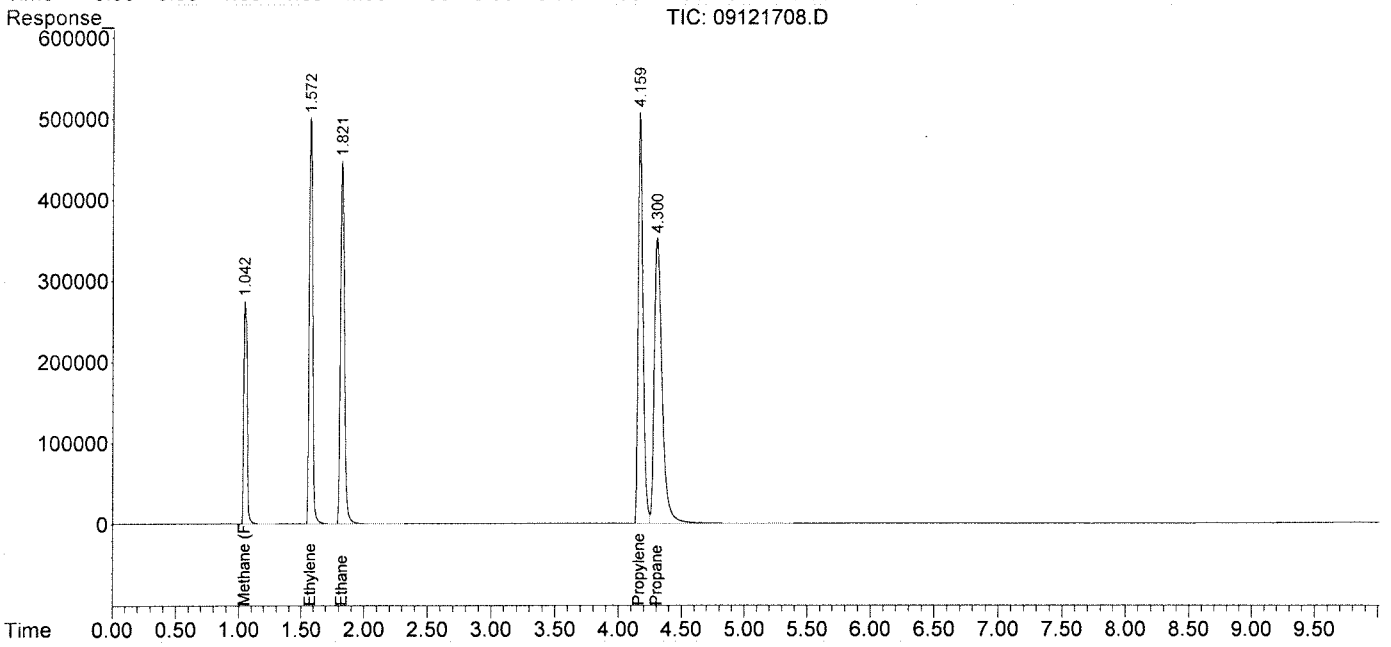
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121708.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:00
Operator : MC
Sample : 600ppm 0.3ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:10:57 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:10:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121709.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:47
Operator : MC
Sample : 1000ppm 0.5ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:11:46 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:11:38 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

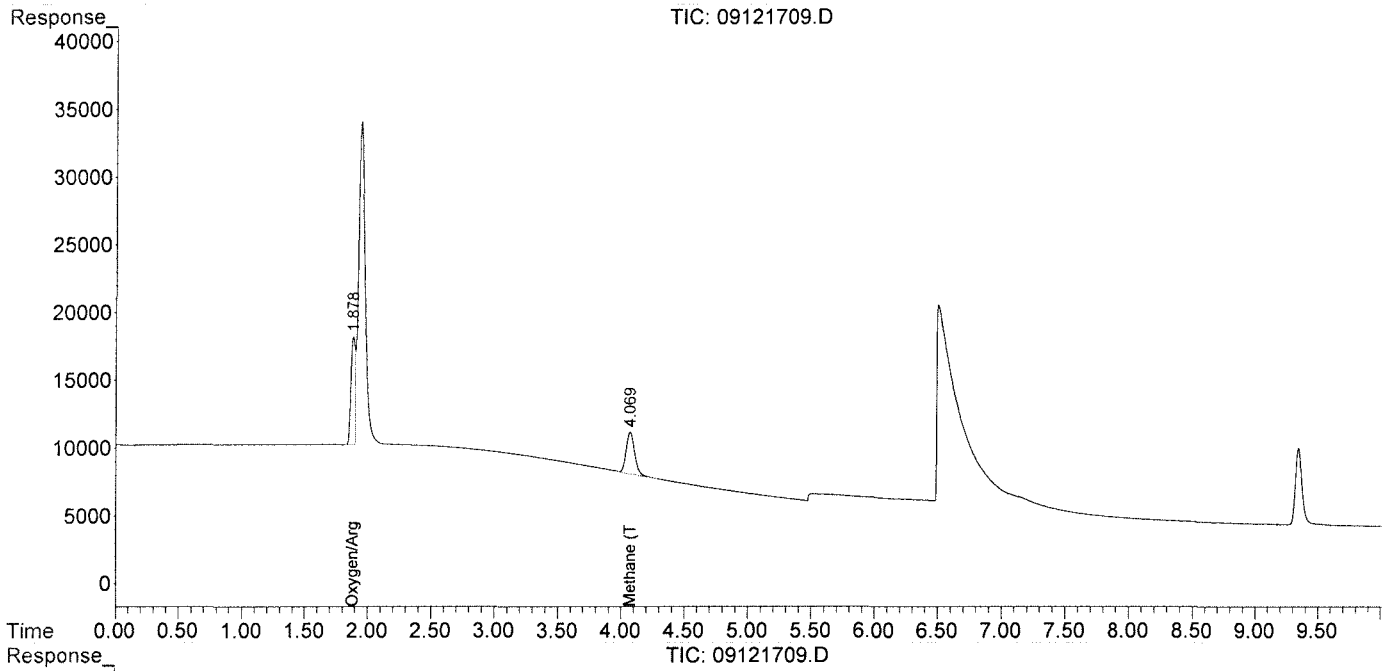
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.879	192611	0.162	ppm
2)	Carbon monoxide	1.879	192611	N.D.	ppm
3)	Methane (TCD)	4.070f	145492	1244.729	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.039	8598534	945.644	ppm
7)	Ethylene	1.576	16608504	981.887	ppm
8)	Ethane	1.827	16709165	973.644	ppm
9)	Propylene	4.161	22494888	941.060	ppm
10)	Propane	4.298	25459411	1023.223	ppm
11)	Isobutylene	6.138	16970	8645.243	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

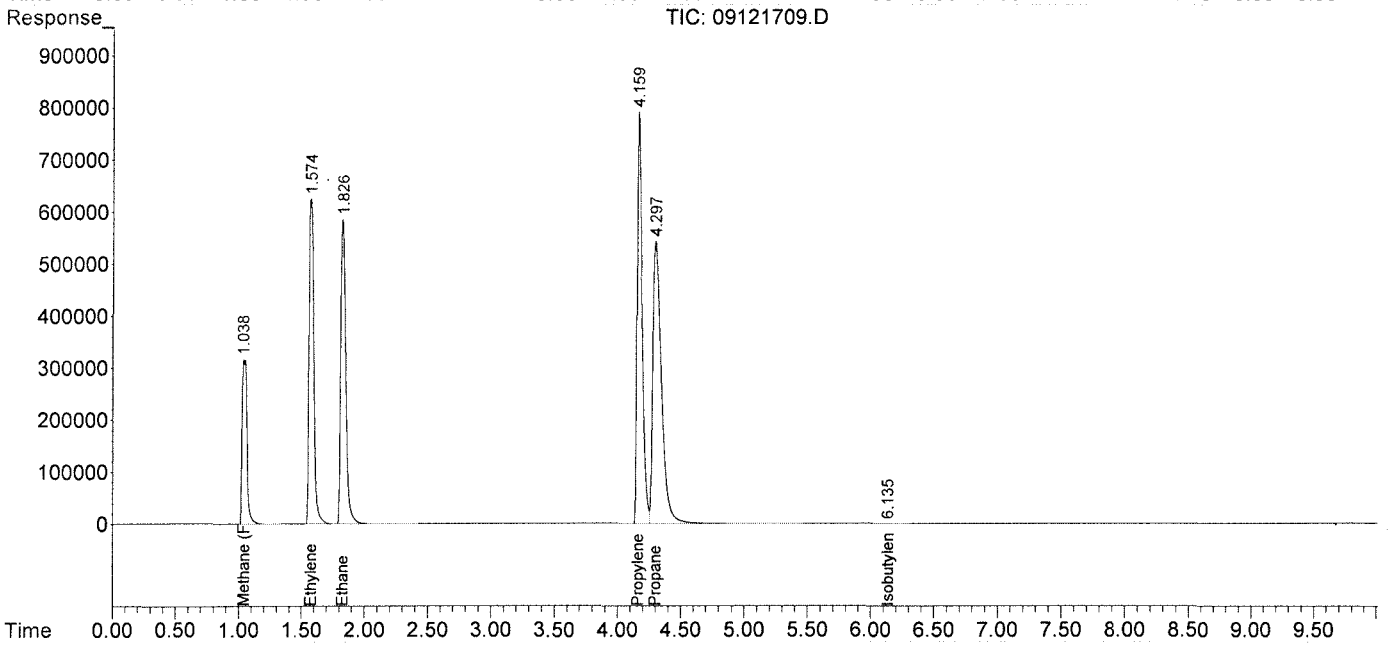
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121709.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:47
Operator : MC
Sample : 1000ppm 0.5ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:11:46 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:11:38 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121710.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:07
Operator : MC
Sample : 2000ppm 1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:12:33 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:12:25 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

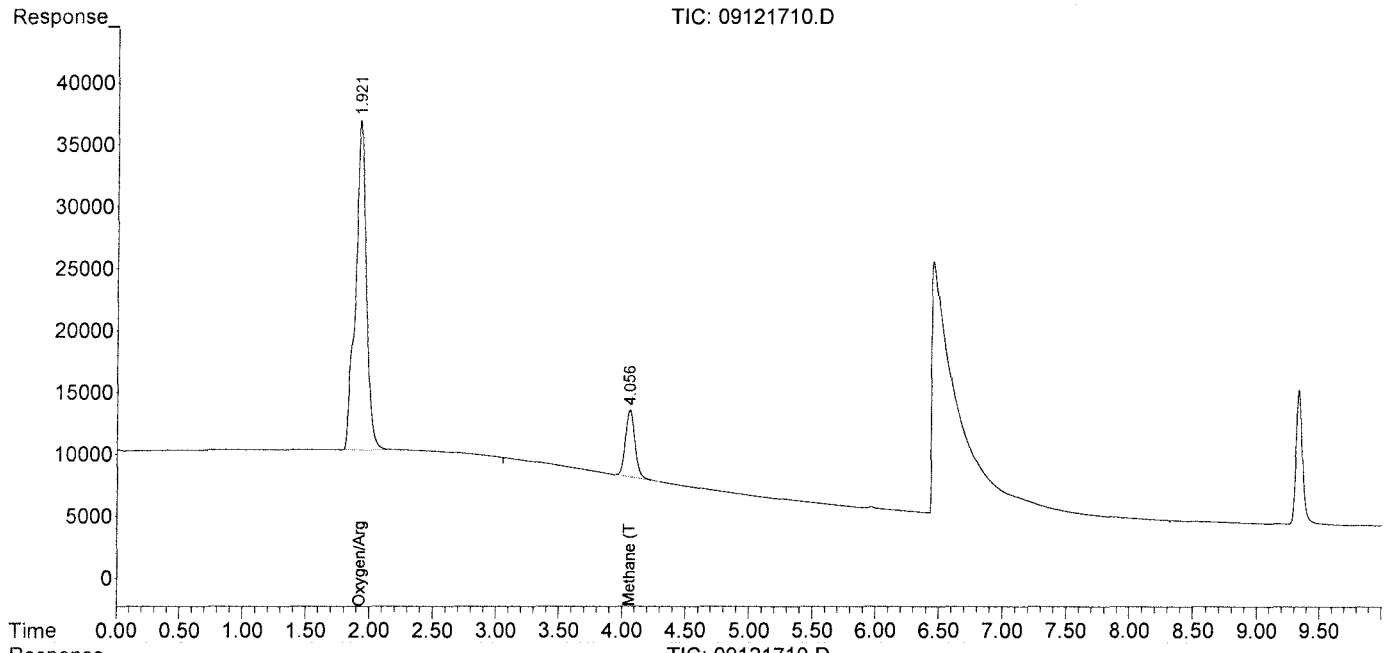
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.922f	1578147	1.659	ppm	
2)	Carbon monoxide	1.922f	1578147	N.D.	ppm	
3)	Methane (TCD)	4.057f	281651	3526.607	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.016	16098209	1763.622	ppm	
7)	Ethylene	1.552	31192444	1848.268	ppm	
8)	Ethane	1.801	31424218	1837.143	ppm	
9)	Propylene	4.129	42124690	1775.341	ppm	m
10)	Propane	4.269	48583085	1946.921	ppm	
11)	Isobutylene	6.136	33832	25613.603	ppm	
12)	Isobutane	6.576f	3845	0.120	ppm	
13)	n-Butane	6.576f	3845	0.120	ppm	

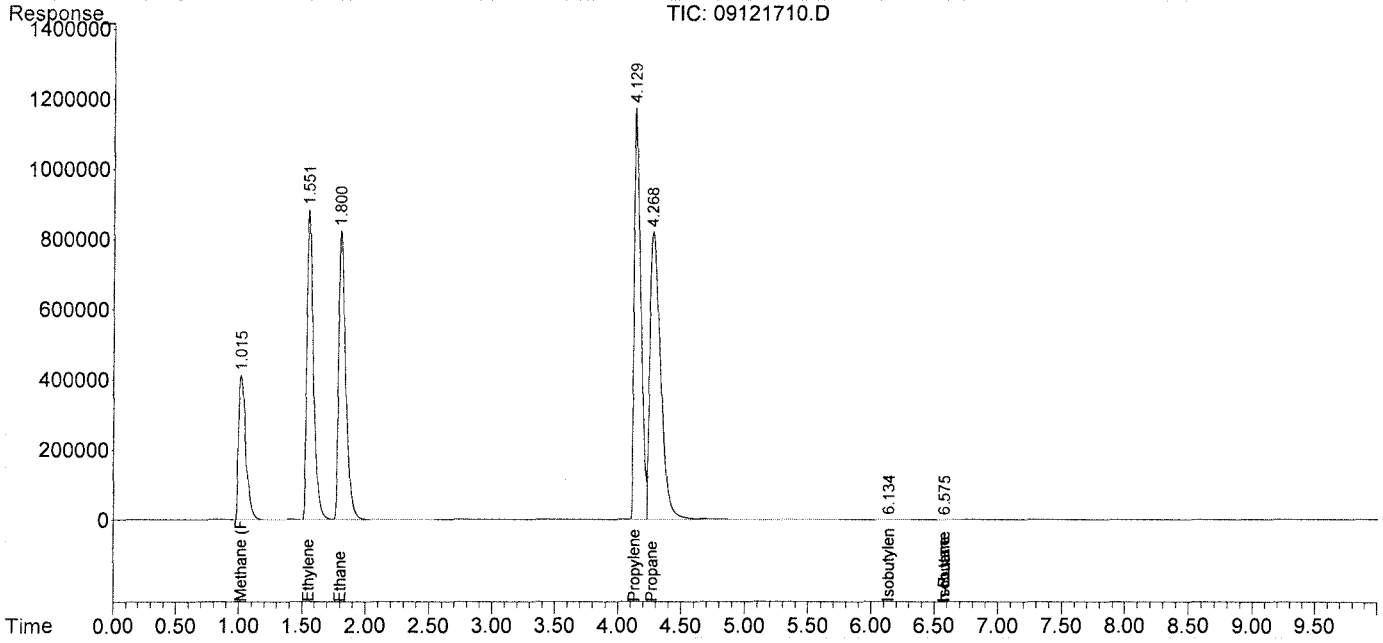
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121710.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:07
Operator : MC
Sample : 2000ppm 1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:12:33 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:12:25 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

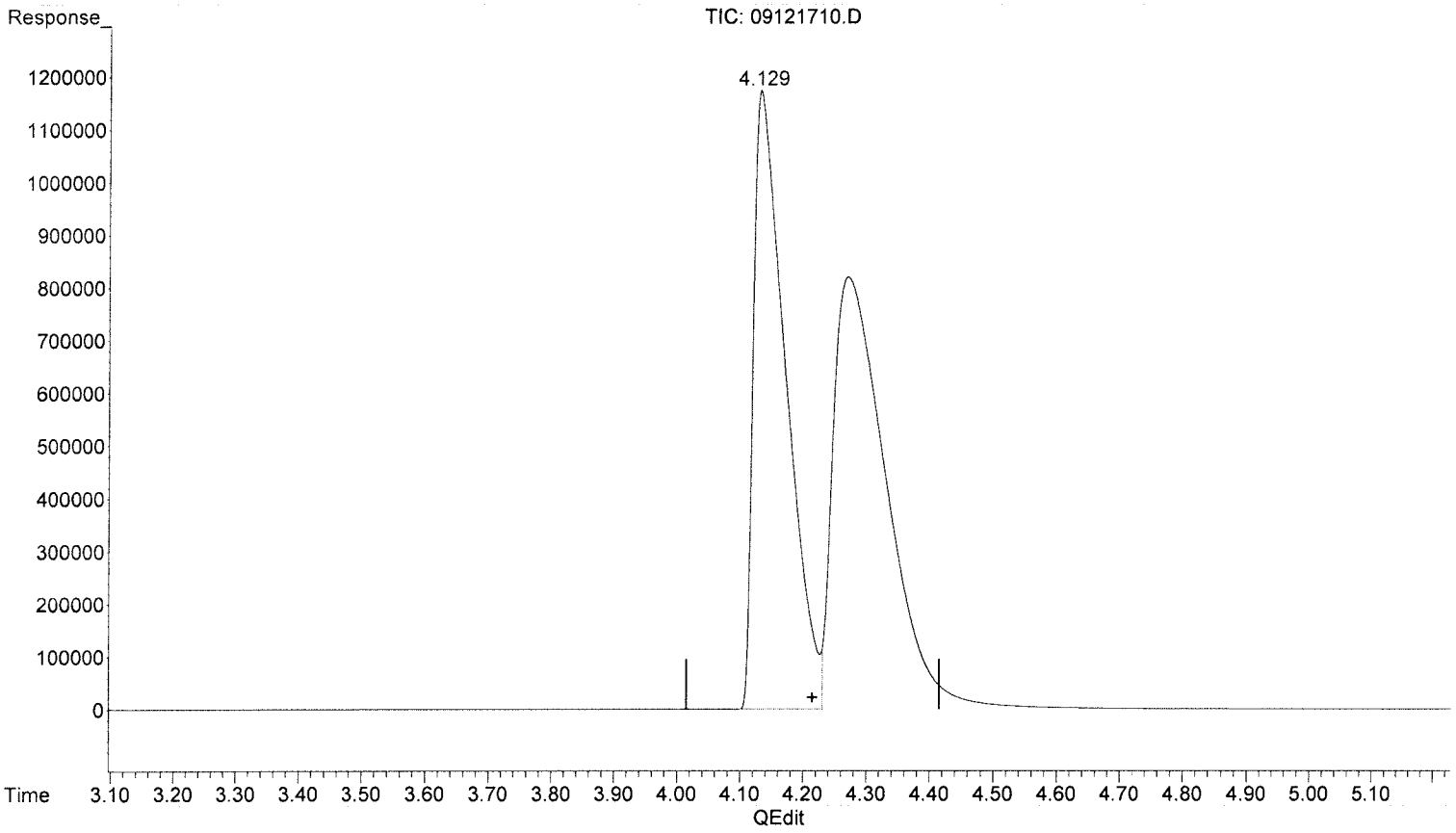




Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121710.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:07
Operator : MC
Sample : 2000ppm 1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:12:33 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:12:25 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(9) Propylene

4.129min 1775.341 ppm m

response 42124690

(+) = Expected Retention Time

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121711.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:48
Operator : MC
Sample : 4000ppm 0.1ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:13:37 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

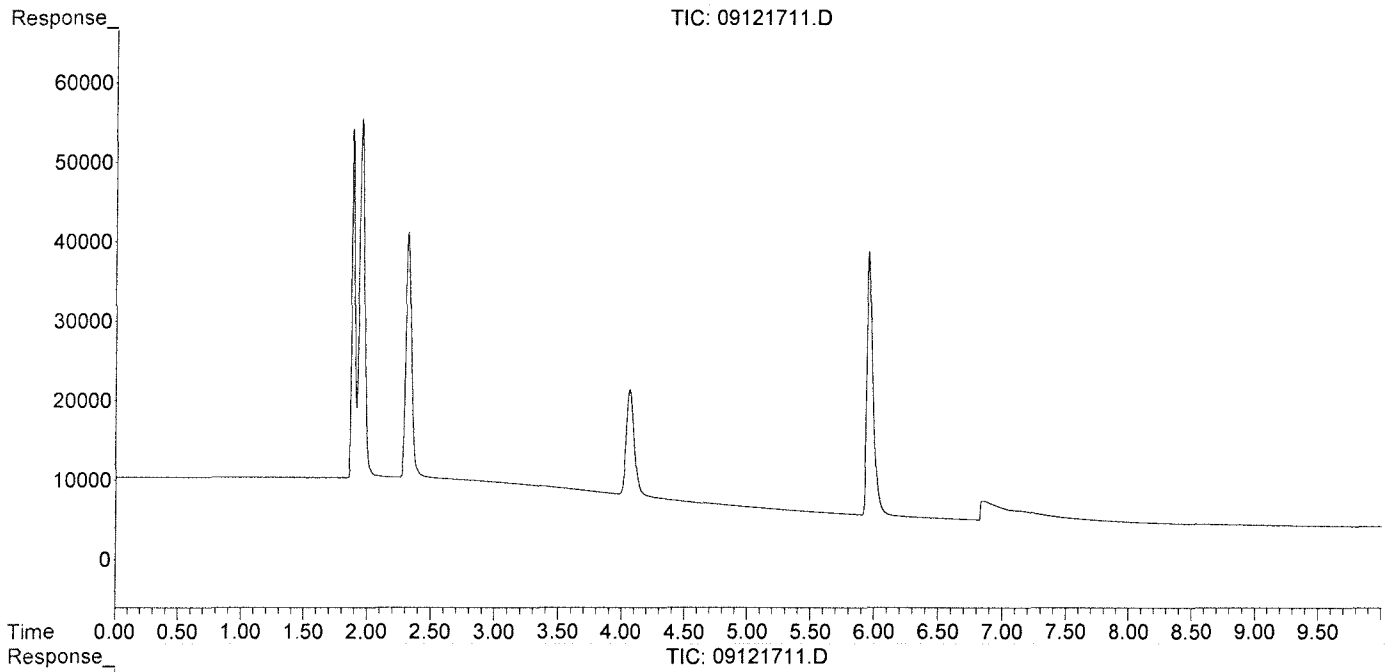
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	0.000	0	N.D.	ppm	d
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	0.000	0	N.D.	ppm	d
6)	Methane (FID)	1.059	35776839	3925.122	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

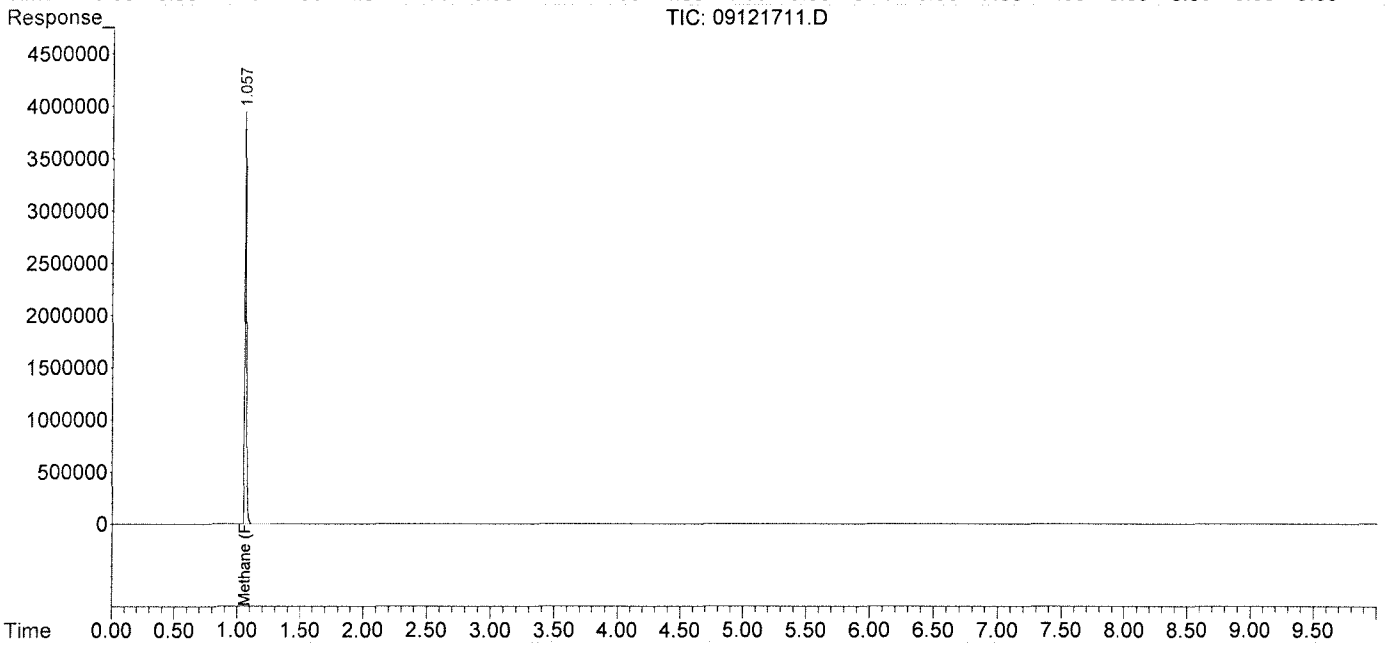
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121711.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:48
Operator : MC
Sample : 4000ppm 0.1ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:13:37 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121712.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 15:21
Operator : MC
Sample : 20000ppm 0.5ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:14:17 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

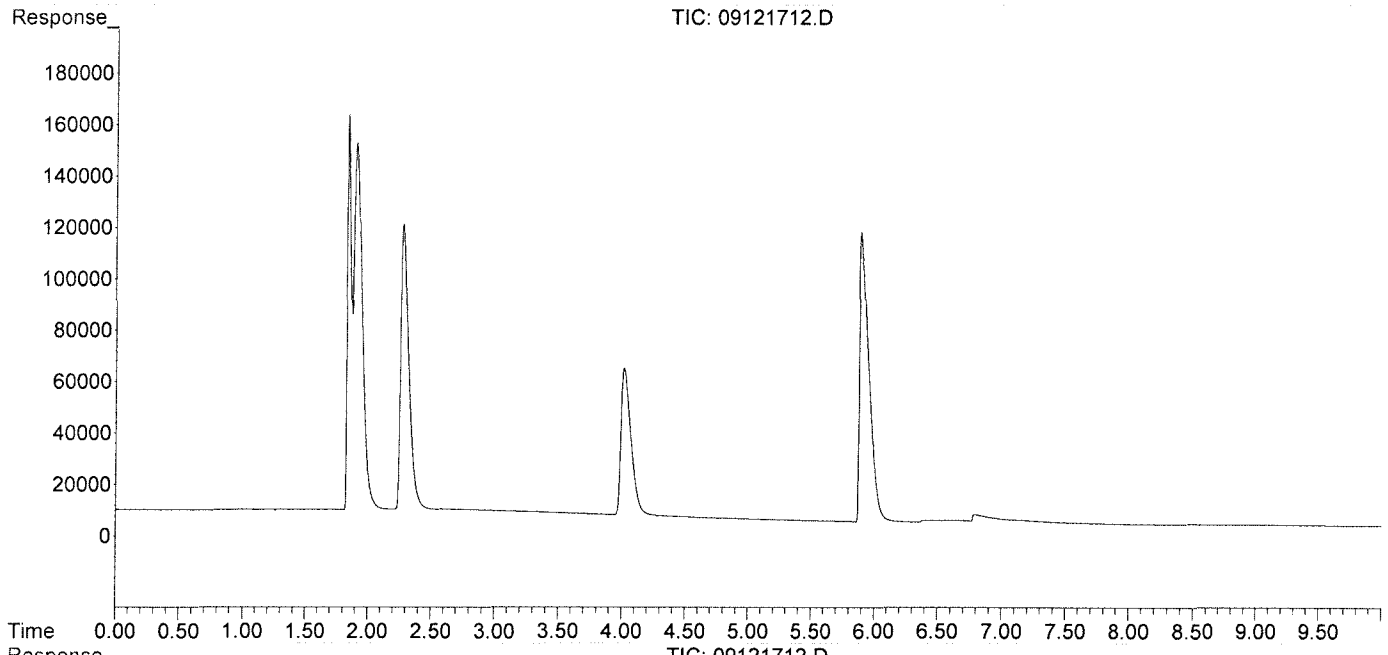
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.836	3190788	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	0.000	0	N.D.	ppm	d
6)	Methane (FID)	1.034	169009160	18492.064	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

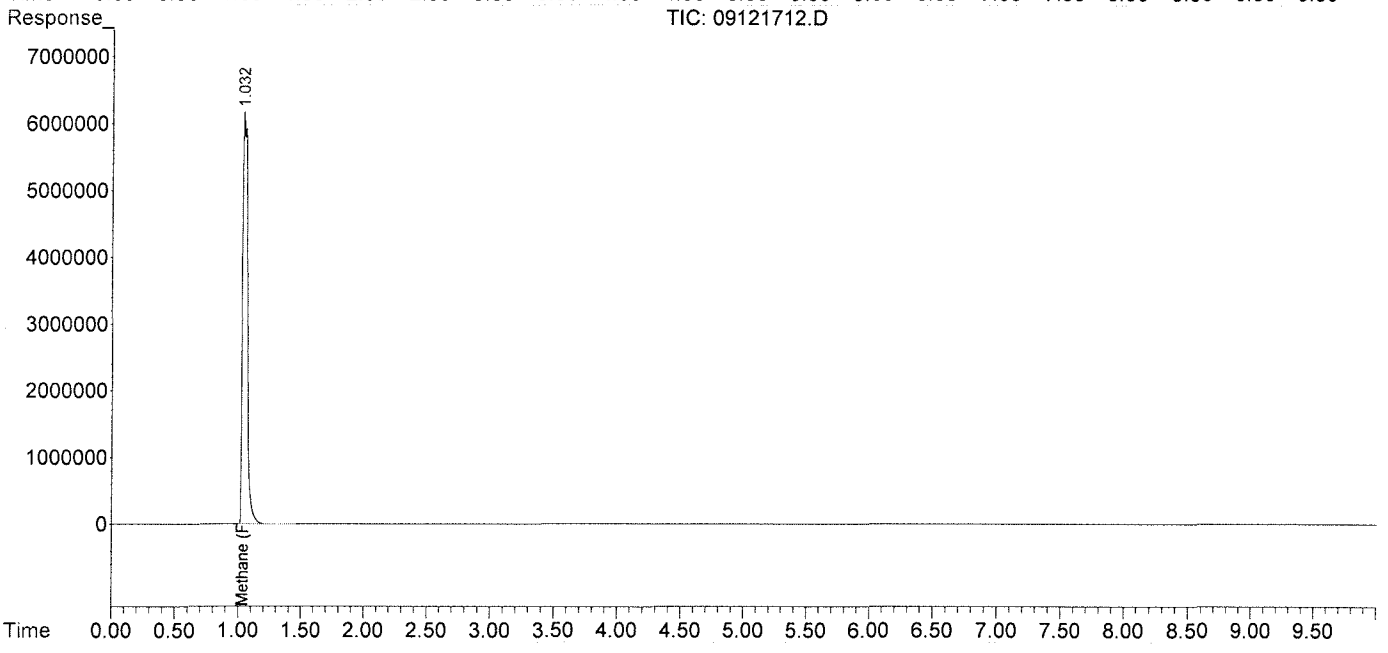
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121712.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 15:21
Operator : MC
Sample : 20000ppm 0.5ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:14:17 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 16:15
Operator : MC
Sample : icv s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:15:11 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.843	2922459	3.687	ppm	
2)	Carbon monoxide	1.843	2922459	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	actual %
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.063	13748	1.516	ppm	~~1570~~ 1.50 101.1
7)	Ethylene	1.598	24153	1.443	ppm	~~1570~~ 1.50 96.2
8)	Ethane	1.850	24488	1.445	ppm	~~1570~~ 1.50 96.3
9)	Propylene	4.221	36004	1.537	ppm	~~1570~~ 1.50 102.5
10)	Propane	4.350	37738	1.517	ppm	~~1571~~ 1.51 100.5
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.579f	48019	1.804	ppm	9/13/17
13)	n-Butane	6.579f	48019	1.804	ppm	

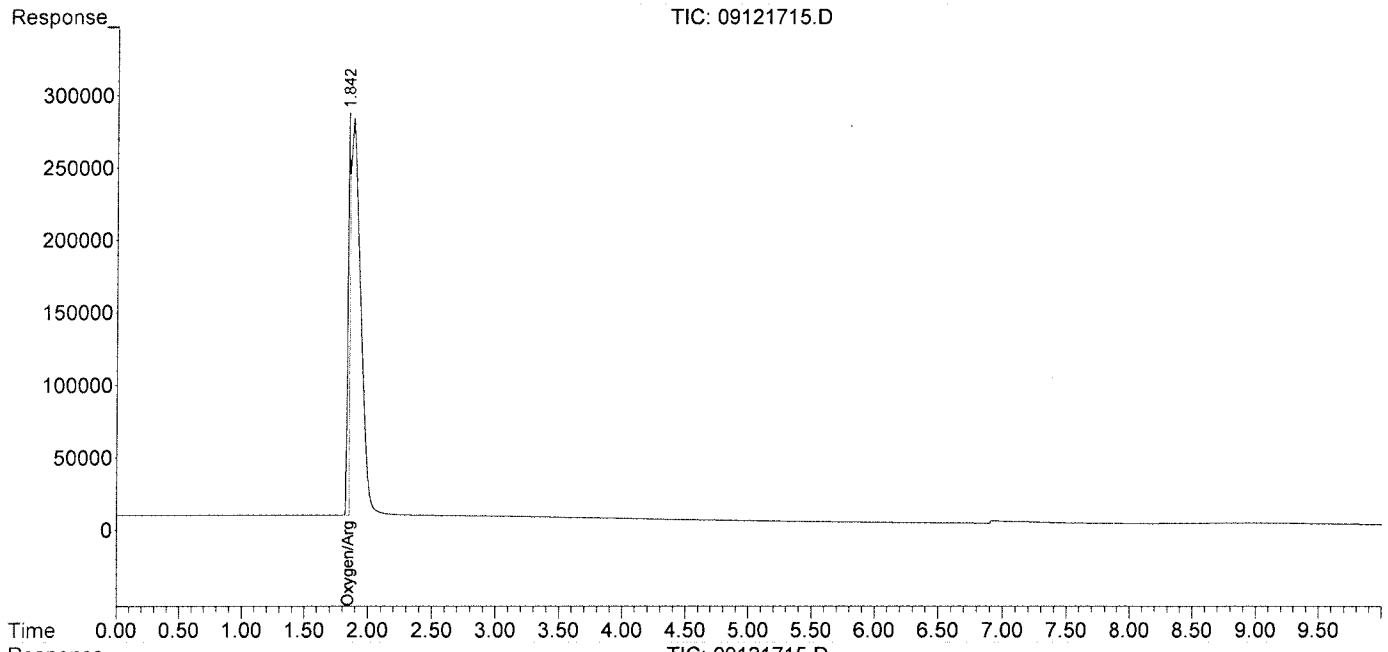
(f)=RT Delta > 1/2 Window (m)=manual int.

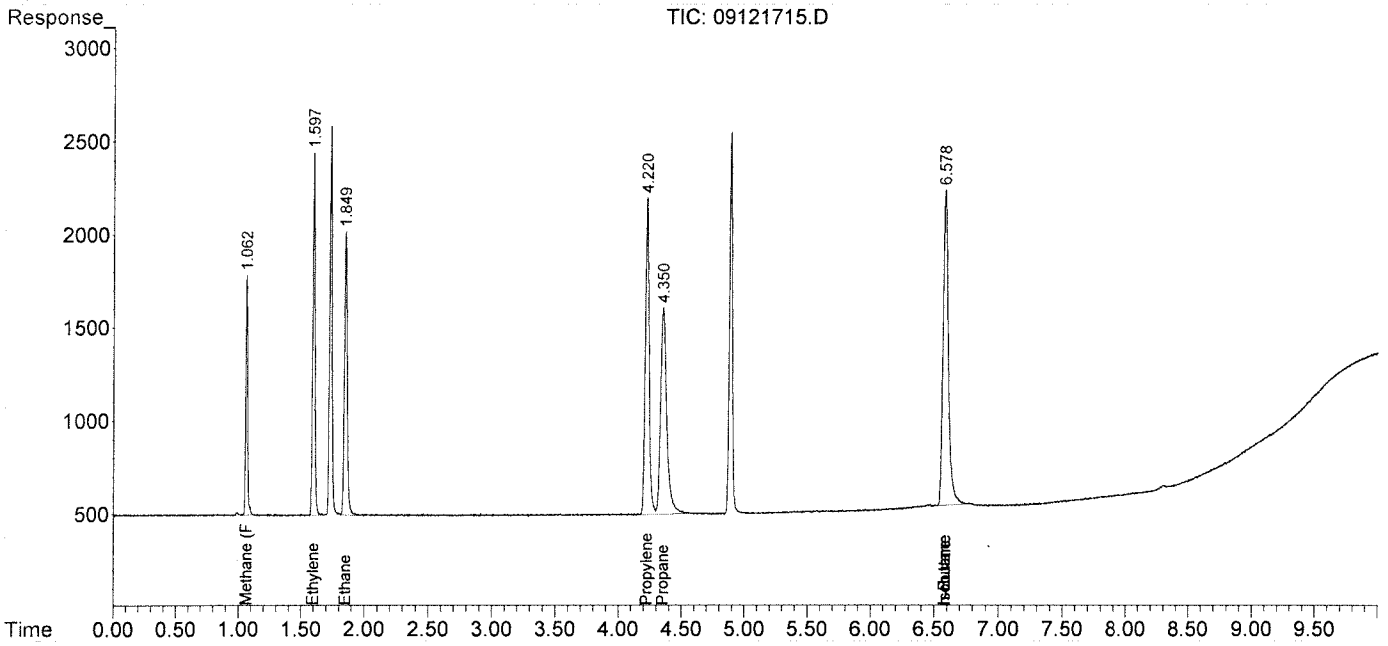
9/13/17

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 16:15
Operator : MC
Sample : icv s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:15:11 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Dissolved Gases by RSK175

ALS Environmental

Method : RSK175 Headspace Method for Dissolved Hydrocarbon in Water by FID/TCD
Client : ALS Laboratory Group
Service Request: P2005613
Sample Vol. (ml) : 32.00 ml
Analyst : WH
Date Analysis : 10/08/20
Head Space Vol.(ml) : 8.00 ml
Instrument : GC#10
Detector : FID#10, TCD#10
Gas Constant : 24.05684 (20°C)

FINAL RESULT (ug/L)

Sample ID	Methane		Ethylene	Ethane
RL	**1.30**		**1.00**	**0.60**
mcs 0.1ml	ND		ND	ND
rb 0.1ml	ND		ND	ND
fid lcs 0.1ml	2.806		5.419	5.004
fid lcsd 0.1ml	2.574		5.046	4.748
P2005613-001 0.1ml	2.172		0.000	0.000
P2005613-002 0.1ml	4.226		0.000	0.000
P2005613-003 0.1ml	4.586		0.142	0.000
P2005613-004 0.1ml	5.100		0.178	0.000
P2005613-005 0.1ml	3.847		0.000	0.000
P2005613-006 0.1ml	0.834	J	0.000	0.000

SPIKE RECOVERY SUMMARY (ug/L)

Sample ID	Methane	Ethylene	Ethane
mcs 0.1ml	ND	ND	ND
Amount Spiked	2.52	4.40	4.72
fid lcs	2.806	5.419	5.004
% Recovered	111.5%	123.1%	106.0%
fid lcsd	2.574	5.046	4.748
% Recovered	102.3%	114.6%	100.6%
% RPD	8.6%	7.1%	5.2%
Amount Spiked	169.19	294.12	316.86
P2005613-001ms 0.1ml	137.393	292.619	273.843
	79.9%	99.5%	86.4%
P2005613-001msd 0.1ml	137.366	289.728	273.324
	79.9%	98.5%	86.3%
	0.0%	1.0%	0.2%

P2005613-001ms 0.1ml	137.393	292.619	273.843	ND	ND	ND
P2005613-001msd 0.1ml	137.366	289.728	273.324	ND	ND	ND

Calculation :
1). Final Headspace Result (ppm) = ppm / Actual Injection Volume (mL)
2). Gas in Water (ug/L) : =[Final Headspace Result (mL) / 10^6 mL * 55.51 mole/L * MWt.(16.04 g/mole for CH4) * 1000 mg/g * 1000 ug/mg]/Henry's Constant
3). Gas in Head Space (ug/L) : = Final Headspace Result (mL) / 10^6 mL * mole/24.06 L (gas constant @20°C) * MWt.(16.04 g/mole for CH4) * 1000 mg/g * 1000 ug/g * L/1000mL * Headspace Volume (mL) / Sample Volume (mL) * 1000 mL/L
4.) Total final result : = 1) + 2)

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082001.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 11:09:32
Operator : WH
Sample : STD S32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 11:22:15 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.120	893552	98.510	ppm
7)	Ethylene	1.688	1748850	104.507	ppm
8)	Ethane	1.951	1753238	103.435	ppm
9)	Propylene	4.318	2558614	109.195	ppm
10)	Propane	4.439	2624489	105.485	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

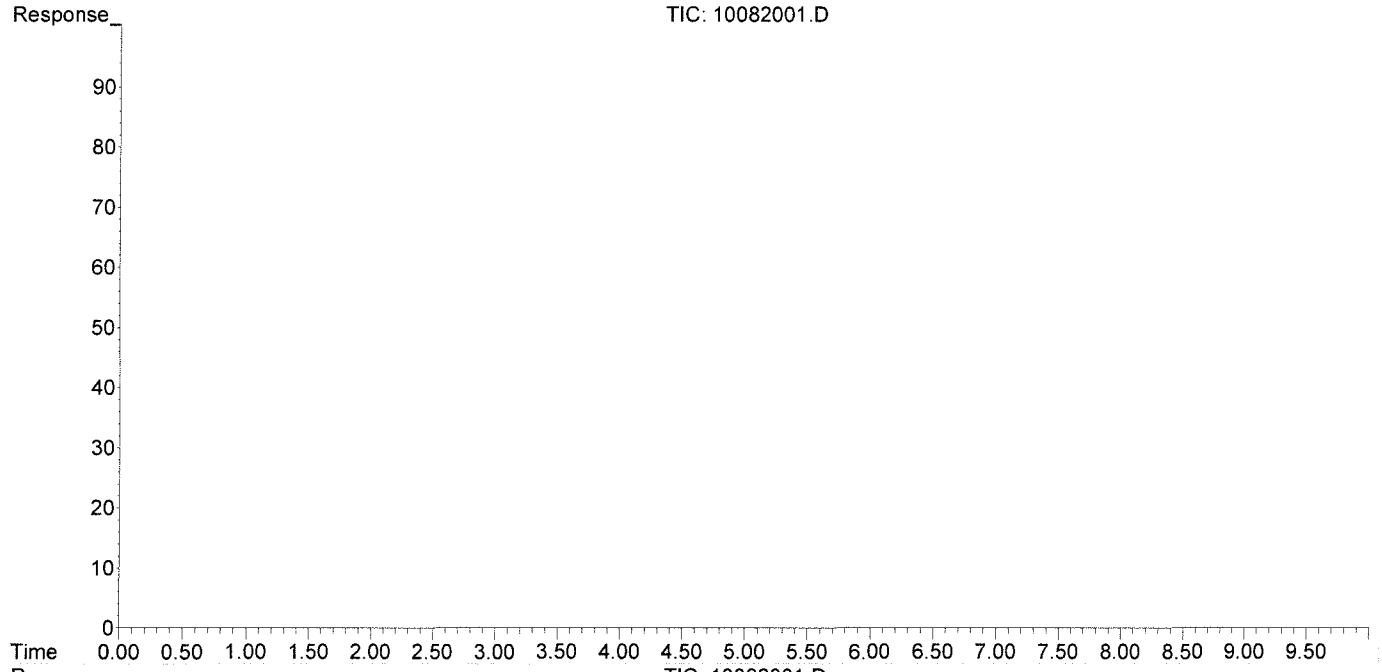
(f)=RT Delta > 1/2 Window (m)=manual int.

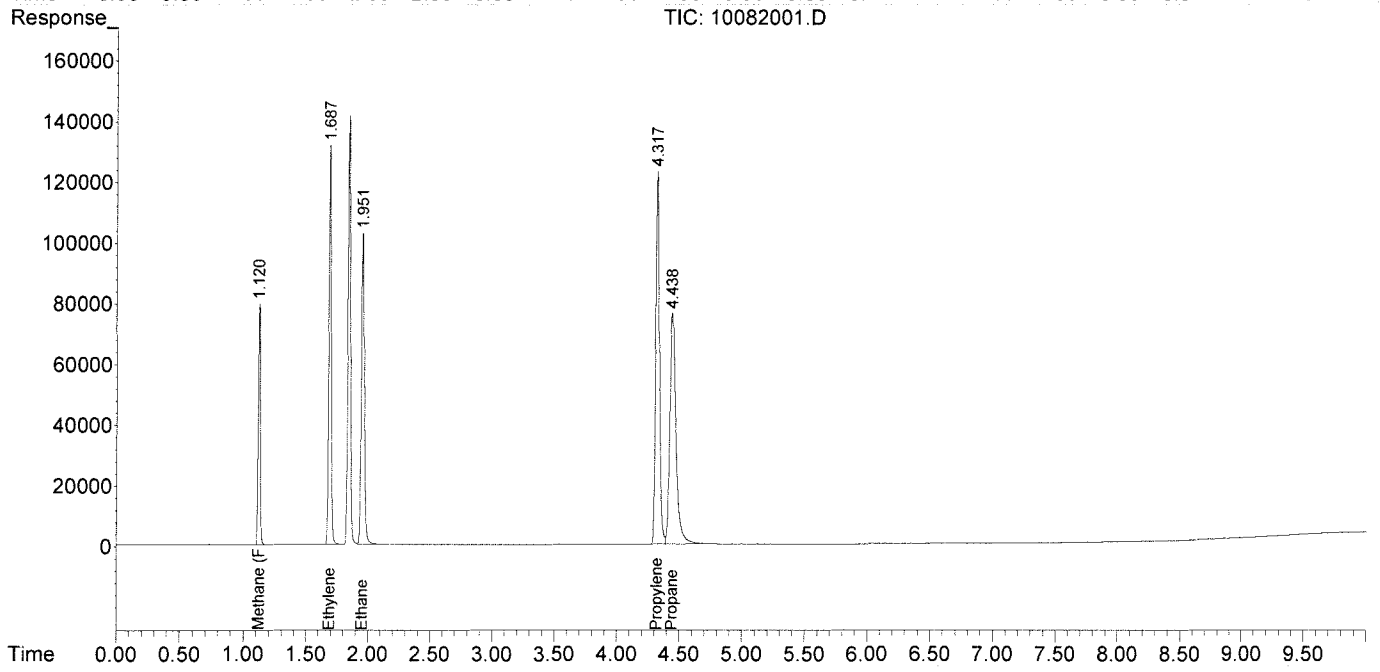
01078990

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082001.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 11:09:32
Operator : WH
Sample : STD S32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 11:22:15 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082014.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 15:19:17
Operator : WH
Sample : STD S32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 15:29:35 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

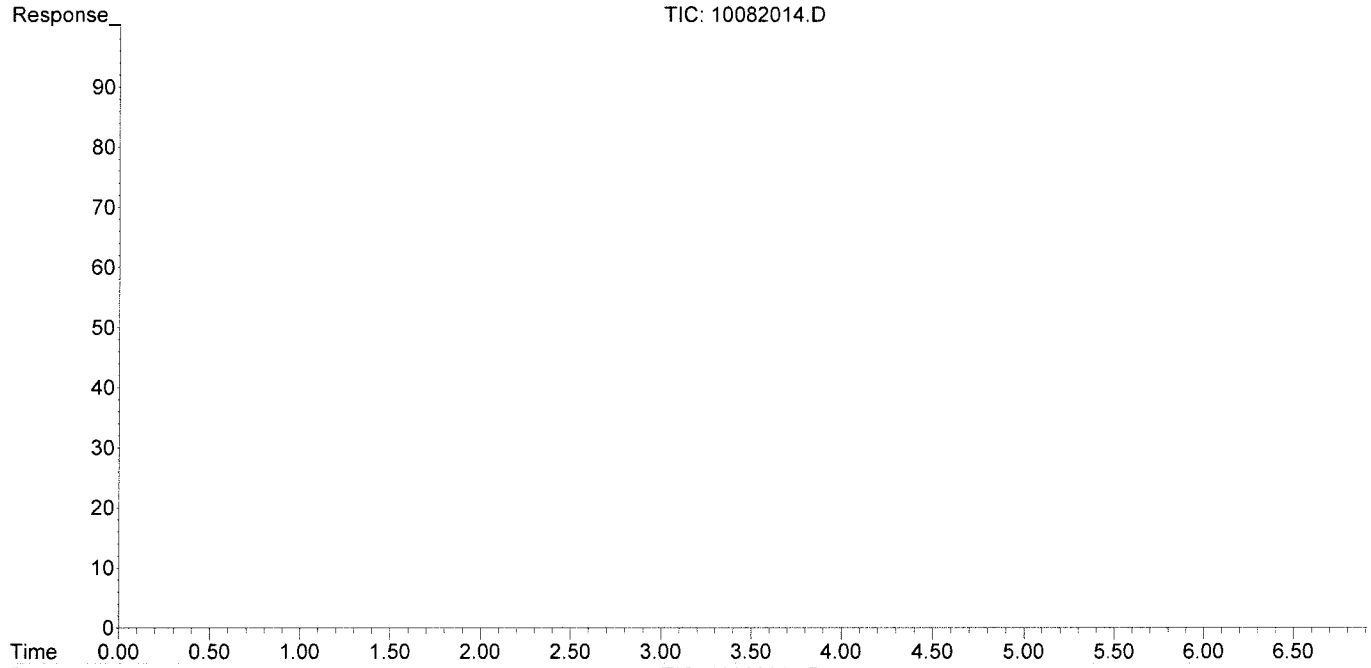
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.117	858400	94.635	ppm
7)	Ethylene	1.685	1675048	100.097	ppm
8)	Ethane	1.948	1683302	99.309	ppm
9)	Propylene	4.315	2446293	104.402	ppm
10)	Propane	4.436	2513672	101.031	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

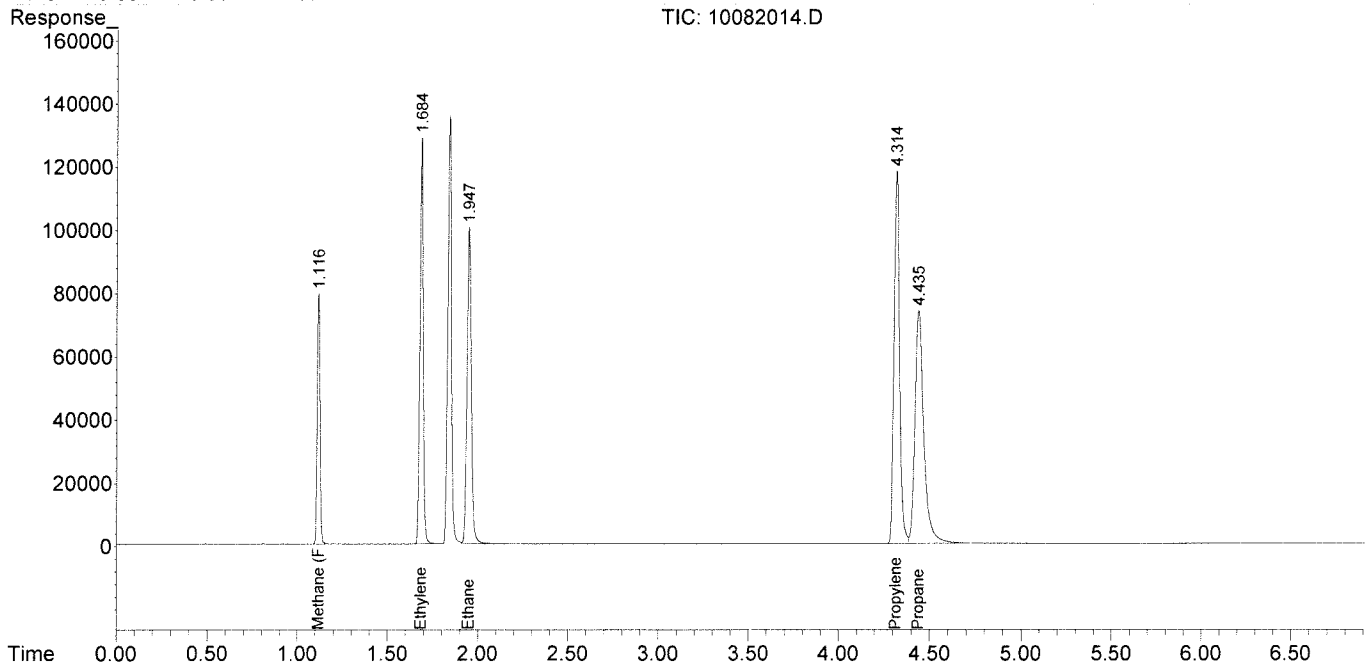
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2020_10\08\
Data File : 10082014.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 08-Oct-2020, 15:19:17
Operator : WH
Sample : STD S32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Oct 08 15:29:35 2020
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Injection Log

Directory: I:\GC10\DATA\RSK_FID\2017_09\12\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	12-Sep-17, 08:38:08	09121701.D	test		MC	RSKBOTH.M	
2	12-Sep-17, 10:52:40	09121702.D	0.151ppm 0.250ml s32-09121702		MC	RSKBOTH.M	Curve
3	12-Sep-17, 11:05:49	09121703.D	0.302ppm 0.5ml s32-09121702		MC	RSKBOTH.M	Curve
4	12-Sep-17, 11:45:34	09121704.D	1.51ppm 0.1ml s32-09051701		MC	RSKBOTH.M	Curve
5	12-Sep-17, 12:09:33	09121705.D	4.53ppm 0.3ml s32-09051701		MC	RSKBOTH.M	Curve
6	12-Sep-17, 12:30:23	09121706.D	10.57ppm 0.7ml s32-09051701		MC	RSKBOTH.M	Curve
7	12-Sep-17, 12:47:18	09121707.D	200ppm 0.1ml s32-09121701		MC	RSKBOTH.M	Curve
8	12-Sep-17, 13:00:22	09121708.D	600ppm 0.3ml s32-09121701		MC	RSKBOTH.M	Curve
9	12-Sep-17, 13:47:48	09121709.D	1000ppm 0.5ml s32-09121701		MC	RSKBOTH.M	Curve
10	12-Sep-17, 14:07:58	09121710.D	2000ppm 1ml s32-09121701		MC	RSKBOTH.M	Curve
11	12-Sep-17, 14:48:48	09121711.D	4000ppm 0.1ml s32-08231701		MC	RSKBOTH.M	Curve
12	12-Sep-17, 15:21:51	09121712.D	20000ppm 0.5ml s32-08231701		MC	RSKBOTH.M	Curve
13	12-Sep-17, 15:38:59	09121713.D	mb 0.5ml		MC	RSKBOTH.M	Pass
14	12-Sep-17, 15:55:35	09121714.D	mb 0.1ml		MC	RSKBOTH.M	Pass
15	12-Sep-17, 16:15:26	09121715.D	icv s30-05241604		MC	RSKBOTH.M	Pass

Injection Log

Directory: I:\GC10\DATA\RSK_FID\2020_10\08\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	08-Oct-20, 11:09:32	10082001.D	STD S32-05221901		WH	RSKBOTH.M	pass
2	08-Oct-20, 11:47:08	10082002.D	rb 0.1ml		WH	RSKBOTH.M	pass
3	08-Oct-20, 12:03:51	10082003.D	mcs 0.1ml		WH	RSKBOTH.M	pass
4	08-Oct-20, 12:25:34	10082004.D	P2005613-002 0.1ml		WH	RSKBOTH.M	
5	08-Oct-20, 12:39:23	10082005.D	P2005613-003 0.1ml		WH	RSKBOTH.M	
6	08-Oct-20, 12:53:36	10082006.D	P2005613-004 0.1ml		WH	RSKBOTH.M	
7	08-Oct-20, 13:02:07	10082007.D	P2005613-005 0.1ml		WH	RSKBOTH.M	
8	08-Oct-20, 13:23:46	10082008.D	P2005613-006 0.1ml		WH	RSKBOTH.M	
9	08-Oct-20, 13:34:41	10082009.D	P2005613-001 0.1ml		WH	RSKBOTH.M	
10	08-Oct-20, 13:50:37	10082010.D	P2005613-001ms 0.1ml		WH	RSKBOTH.M	pass
11	08-Oct-20, 14:11:07	10082011.D	P2005613-001msd 0.1ml		WH	RSKBOTH.M	pass
12	08-Oct-20, 14:31:22	10082012.D	fid lcs 0.1ml		WH	RSKBOTH.M	pass
13	08-Oct-20, 15:03:59	10082013.D	fid lcsd 0.1ml		WH	RSKBOTH.M	pass
14	08-Oct-20, 15:19:17	10082014.D	STD S32-05221901		WH	RSKBOTH.M	pass
15	08-Oct-20, 15:30:40	10082015.D	P2005607-001 0.1		WH	RSKBOTH.M	
16	08-Oct-20, 15:45:29	10082016.D	P2005607-002 0.1		WH	RSKBOTH.M	
17	08-Oct-20, 15:58:00	10082017.D	P2005607-003 0.1		WH	RSKBOTH.M	
18	08-Oct-20, 16:20:20	10082018.D	P2005607-004 0.1		WH	RSKBOTH.M	
19	08-Oct-20, 16:49:47	10082019.D	P2005607-005 0.1		WH	RSKBOTH.M	
20	08-Oct-20, 17:11:07	10082020.D	STD S32-05221901		WH	RSKBOTH.M	pass

HS20100074 8260_W_DOD Raw Data

ALS WO# HS20100074

MSVOA06 -Logbook

Batch: 41874 **Analyst:** Presenta Cabascango

Date: 09-24-2020 **Reviewer:**

Method: 8260 **Laboratory:** Houston

Comments:

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
1	BFB	TUNE	09-24-2020 11:10 am	1.00	50 mL	50 mL	X092401.D	Liquid	Y	NA
	Auto find/ purged									
2	VSTD000.25	ICAL1	09-24-2020 11:34 am	1.00	50 mL	50 mL	X092402.D	Liquid	Y	NA
	0.10 uL cal std/100 mL DI									
3	VSTD000.5	ICAL2	09-24-2020 11:58 am	1.00	50 mL	50 mL	X092403.D	Liquid	Y	NA
	0.10 uL cal std/50 mL DI									
4	VSTD001	ICAL3	09-24-2020 12:46 pm	1.00	50 mL	50 mL	X092404.D	Liquid	Y	NA
	0.20 uL cal std/50 mL DI									
5	VSTD002	ICAL4	09-24-2020 01:10 pm	1.00	50 mL	50 mL	X092405.D	Liquid	Y	NA
	0.40 uL cal std/50 mL DI									
6	VSTD005	ICAL5	09-24-2020 01:33 pm	1.00	50 mL	50 mL	X092406.D	Liquid	Y	NA
	1.0 uL cal std/50 mL DI									
7	VSTD020	ICAL6	09-24-2020 01:57 pm	1.00	50 mL	50 mL	X092407.D	Liquid	Y	NA
	4.0 uL cal std/50 mL DI									
8	VSTD050	ICAL7	09-24-2020 02:21 pm	1.00	50 mL	50 mL	X092408.D	Liquid	Y	NA
	10 uL cal std/50 mL DI									
9	VSTD100	ICAL8	09-24-2020 02:45 pm	1.00	50 mL	50 mL	X092409.D	Liquid	Y	NA
	20 uL cal std/50 mL DI									
10	VSTD150	ICAL9	09-24-2020 03:09 pm	1.00	50 mL	50 mL	X092410.D	Liquid	Y	NA
	30 uL cal std/50 mL DI									
11	VSTD200	ICAL	09-24-2020 03:33 pm	1.00	50 mL	50 mL	X092411.D	Liquid	Y	NA
	40 uL cal std/50 mL DI									
12	BLANK	SAMP	09-24-2020 03:57 pm	1.00	50 mL	50 mL	X092412.D	Liquid	Y	NA
13	BLANK	SAMP	09-24-2020 04:21 pm	1.00	50 mL	50 mL	X092413.D	Liquid	Y	NA
14	VSTD050	ICV	09-24-2020 04:45 pm	1.00	50 mL	50 mL	X092414.D	Liquid	Y	NA
	10 uL ical std/50 mL DI									
15	CCB	SAMP	09-24-2020 05:09 pm	1.00	50 mL	50 mL	X092415.D	Liquid	Y	NA
16	VLCSW-200924	LCS	09-24-2020 05:33 pm	1.00	50 mL	50 mL	X092416.D	Liquid	Y	na
	4.0 uL cal std/50 mL DI									
17	BLK	SAMP	09-24-2020 05:57 pm	1.00	50 mL	50 mL	X092417.D	Liquid	Y	na
18	BLK	SAMP	09-24-2020 06:21 pm	1.00	50 mL	50 mL	X092418.D	Liquid	Y	na
19	VBLKW-200924	MBLK	09-24-2020 06:45 pm	1.00	50 mL	50 mL	X092419.D	Liquid	Y	na
20	HS20090748-03	SAMP	09-24-2020 07:09 pm	1.00	50 mL	50 mL	X092420.D	Liquid	Y	<2
21	HS20091030-02	SAMP	09-24-2020 07:33 pm	1.00	50 mL	50 mL	X092421.D	Liquid	Y	<2
22	HS20090748-01	SAMP	09-24-2020 07:58 pm	1.00	50 mL	50 mL	X092422.D	Liquid	Y	<2
23	HS20091030-01	SAMP	09-24-2020 08:22 pm	1.00	50 mL	50 mL	X092423.D	Liquid	Y	<2
24	HS20090796-01	SAMP	09-24-2020 08:46 pm	1.00	50 mL	50 mL	X092424.D	Liquid	Y	<2
25	HS20090748-01MS	MS	09-24-2020 09:10 pm	1.00	50 mL	50 mL	X092425.D	Liquid	Y	<2
	3.5 uL cal std/40 mL amp									
26	HS20090748-01MSD	MSD	09-24-2020 09:34 pm	1.00	50 mL	50 mL	X092426.D	Liquid	Y	<2
	3.5 uL cal std/40 mL samp									
27	CCV-END	CCV	09-24-2020 09:58 pm	1.00	50 mL	50 mL	X092427.D	Liquid	Y	na
	10 uL cal std/50 mL DI									

MSVOA06 -Logbook

Chemical	Value
SURR SPK ID	31106-47-06
IS ID	31106-47-06
CAL STD ID	31106-48-01/02
BFB ID	31106-47-06
pH Paper	634-64-10

FORM 3
WATER VOLATILE METHOD SPIKE RECOVERY

Lab Name: ALS-HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS20100074

Matrix Spike - Sample No.: ICV

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
cis-1,2-Dichloroethene	50.00	44.88	90	80-120
Vinyl Chloride	50.00	43.77	88	80-120
Methylene Chloride	50.00	48.15	96	80-120
1,1-Dichloroethene	50.00	43.02	86	80-120
1,2-Dichloroethane	50.00	45.12	90	80-120
Trichloroethene	50.00	44.33	89	80-120
1,1,2-Trichloroethane	50.00	44.55	89	80-120
Tetrachloroethene	50.00	41.29	82	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: ALS-HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS20100074

Lab File ID: X092401 BFB Injection Date: 09/24/20

Instrument ID: VOA6 BFB Injection Time: 1110

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	20.0
75	30.0 - 60.0% of mass 95	50.3
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.5
173	Less than 2.0% of mass 174	0.5 (0.9)1
174	Greater than 50.0% of mass 95	61.7
175	5.0 - 9.0% of mass 174	4.5 (7.4)1
176	95.0 - 101.0% of mass 174	59.2 (95.9)1
177	5.0 - 9.0% of mass 176	4.1 (7.0)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	X092402	09/24/20	1134
02	VSTD000.5	VSTD000.5	X092403	09/24/20	1158
03	VSTD001	VSTD001	X092404	09/24/20	1246
04	VSTD002	VSTD002	X092405	09/24/20	1310
05	VSTD005	VSTD005	X092406	09/24/20	1333
06	VSTD020	VSTD020	X092407	09/24/20	1357
07	VSTD050	VSTD050	X092408	09/24/20	1421
08	VSTD100	VSTD100	X092409	09/24/20	1445
09	VSTD150	VSTD150	X092410	09/24/20	1509
10	VSTD200	VSTD200	X092411	09/24/20	1533
11	ICV	ICV	X092414	09/24/20	1645
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS-HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS20100074

Instrument ID: VOA6 Calibration Date(s): 09/24/20 09/24/20

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1134 1533

LAB FILE ID: RF0.25: X092402 RF0.5: X092403 RF1: X092404
RF2: X092405 RF5: X092406 RF20: X092407

COMPOUND	RF0.25	RF0.5	RF1	RF2	RF5	RF20
Vinyl Chloride		0.636	0.723	0.606	0.632	0.612
Methylene Chloride		5505	9684	16648	39690	137362
1,1-Dichloroethene		0.476	0.539	0.431	0.448	0.435
1,2-Dichloroethane		0.464	0.540	0.412	0.472	0.402
Trichloroethene		0.372	0.414	0.359	0.376	0.338
1,1,2-Trichloroethane		0.329	0.353	0.304	0.315	0.282
Tetrachloroethene		0.330	0.385	0.342	0.326	0.303
Dibromofluoromethane		0.609	0.515	0.484	0.562	0.504
1,2-Dichloroethane-d4		0.637	0.580	0.541	0.589	0.547
Toluene-d8		1.586	1.355	1.300	1.446	1.276
4-Bromofluorobenzene		6772	10018	18232	43900	154353

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS-HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS2010007

Instrument ID: VOA6 Calibration Date(s): 09/24/20 09/24/20

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1134 1533

LAB FILE ID: RF50: X092408 RF100: X092409 RF150: X092410
RF200: X092411

COMPOUND	RF50	RF100	RF150	RF200
Vinyl Chloride	0.579	0.668	0.670	0.686
Methylene Chloride	303593	605902	861961	1112263
1,1-Dichloroethene	0.402	0.438	0.438	0.436
1,2-Dichloroethane	0.392	0.397	0.401	0.401
Trichloroethene	0.312	0.346	0.350	0.351
1,1,2-Trichloroethane	0.267	0.267	0.269	0.265
Tetrachloroethene	0.253	0.302	0.303	0.299
Dibromofluoromethane	0.491	0.491	0.483	0.485
1,2-Dichloroethane-d4	0.545	0.544	0.536	0.539
Toluene-d8	1.241	1.226	1.208	1.191
4-Bromofluorobenzene	368645	706326	1011330	1311827

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS-HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS2010007

Instrument ID: VOA6 Calibration Date(s): 09/24/20 09/24/20

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1134 1533

COMPOUND	CURVE	COEFFICENTS A0	COEFFICENTS A1	%RSD OR R^2	MAX %RSD OR R^2
Vinyl Chloride	AVRG		0.64586993	6.955	15.000
Methylene Chloride	LINR	-1.42e-002	1.85325576	0.9998633	0.9900000
1,1-Dichloroethene	AVRG		0.44955963	8.570	15.000
1,2-Dichloroethane	AVRG		0.43110842	11.681	15.000
Trichloroethene	AVRG		0.35763128	7.969	15.000
1,1,2-Trichloroethane	AVRG		0.29447500	10.989	15.000
Tetrachloroethene	AVRG		0.31588869	11.507	15.000
Dibromofluoromethane	AVRG		0.51378762	8.475	15.000
1,2-Dichloroethane-d4	AVRG		0.56206107	6.062	15.000
Toluene-d8	AVRG		1.31453904	9.856	15.000
4-Bromofluorobenzene	LINR	-1.66e-002	2.33275892	0.9999120	0.9900000

FORM VI VOA

Data File: \\nahstws005\Target\chem\voa6.i\X200924.b\CBI-Houston\X092401.D

Date : 24-SEP-2020 11:10

Client ID: BFB

Instrument: voa6.i

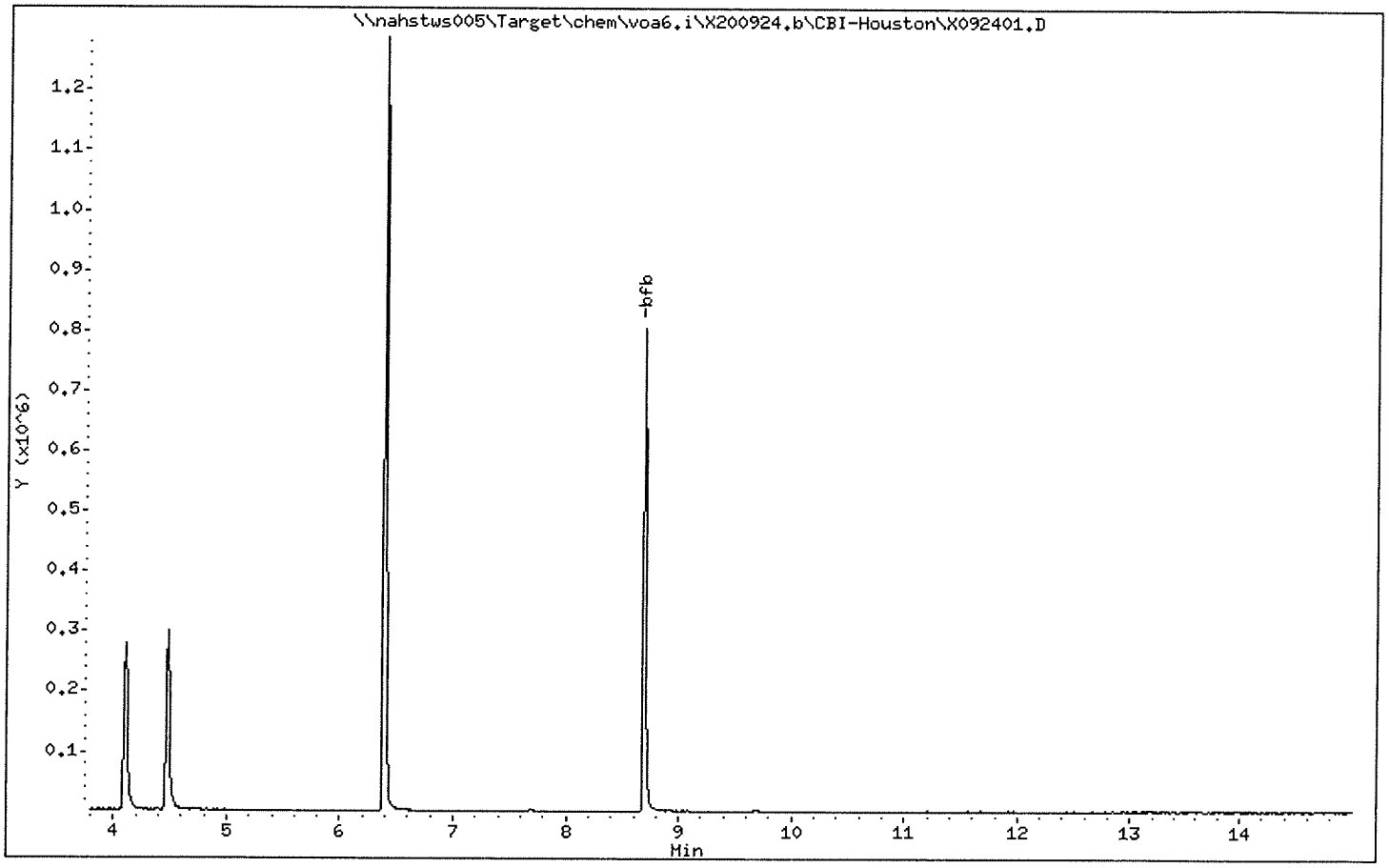
Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25



Data File: \\nahstws005\Target\chem\voa6.i\X200924.b\CBI-Houston\X092401.D

Date : 24-SEP-2020 11:10

Client ID: BFB

Instrument: voa6.i

Sample Info: BFB;BFB;3;;BFB

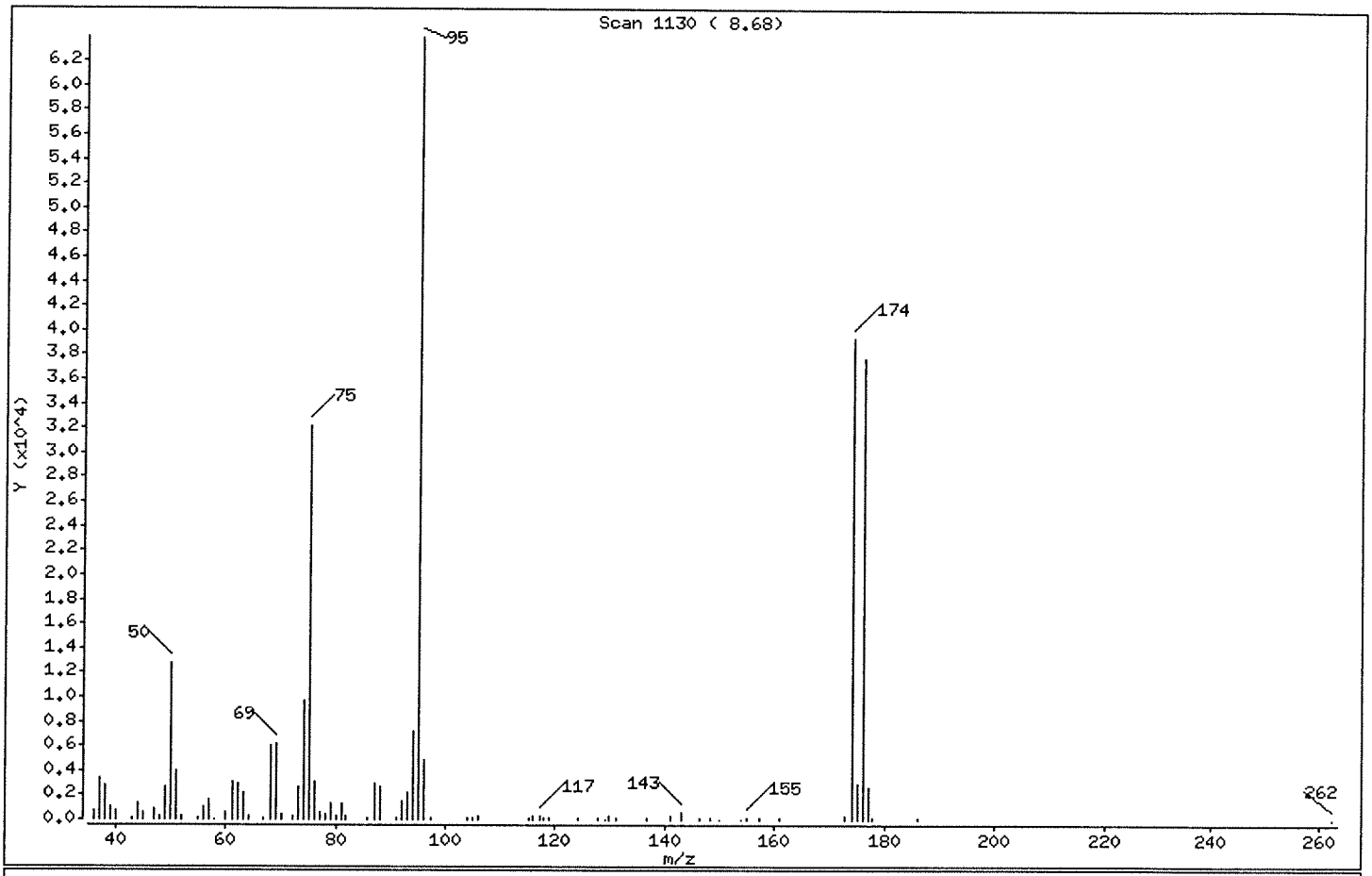
Volume Injected (uL): 2.0

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	19.97
75	30.00 - 60.00% of mass 95	50.32
96	5.00 - 9.00% of mass 95	7.53
173	Less than 2.00% of mass 174	0.54 (0.87)
174	Greater than 50.00% of mass 95	61.71
175	5.00 - 9.00% of mass 174	4.54 (7.36)
176	95.00 - 101.00% of mass 174	59.18 (95.90)
177	5.00 - 9.00% of mass 176	4.14 (6.99)

Data File: \\nahstws005\Target\chem\voa6.i\X200924.b\CBI-Houston\X092401.D

Date : 24-SEP-2020 11:10

Client ID: BFB

Instrument: voa6.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25

Data File: X092401.D
Spectrum: Scan 1130 (8.68)
Location of Maximum: 95.10
Number of points: 79

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.10	680	62.10	2916	88.00	2589	131.00	177
37.10	3328	63.10	2146	90.90	197	136.90	95
38.10	2848	64.20	251	92.10	1499	141.00	363
39.10	1092	67.00	144	93.10	2228	143.00	535
40.10	702	68.10	6060	94.10	7204	146.20	84
43.20	90	69.10	6113	95.10	63928	148.20	88
44.10	1373	70.10	387	96.10	4811	149.90	62
45.10	600	72.10	357	97.20	145	153.90	52
47.10	929	73.10	2682	104.00	204	155.00	162
48.00	358	74.10	9632	105.00	136	157.10	128
49.10	2668	75.10	32168	105.80	273	160.80	100
50.10	12768	76.10	3061	115.20	130	172.90	344
51.10	4025	77.00	582	116.00	238	174.00	39448
52.10	271	78.10	388	117.10	274	175.10	2905
55.00	135	79.00	1342	117.90	175	176.00	37832
56.10	1094	80.00	329	119.00	202	177.00	2644
57.10	1650	81.10	1363	124.00	76	177.90	81
58.10	54	81.90	267	127.90	200	186.10	193
60.00	635	85.90	78	129.00	73	262.20	52
61.10	3138	87.10	3005	129.90	222		

Data File: X092402.D
Report Date: 26-Oct-2020 07:27

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X200924.b\CBI-Houston\X092402.D
Lab Smp Id: VSTD000.25 Client Smp ID: VSTD000.25
Inj Date : 24-SEP-2020 11:34
Operator : PC Inst ID: voa6.i
Smp Info : VSTD000.25;VSTD000.25;1;1;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X200924.b\CBI-Houston\8260W.m
Meth Date : 26-Oct-2020 07:27 voa6.i Quant Type: ISTD
Cal Date : 24-SEP-2020 15:33 Cal File: X092411.D
Als bottle: 2 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOUSTON.sub
Target Version: 4.14
Processing Host: NAHSTW7056

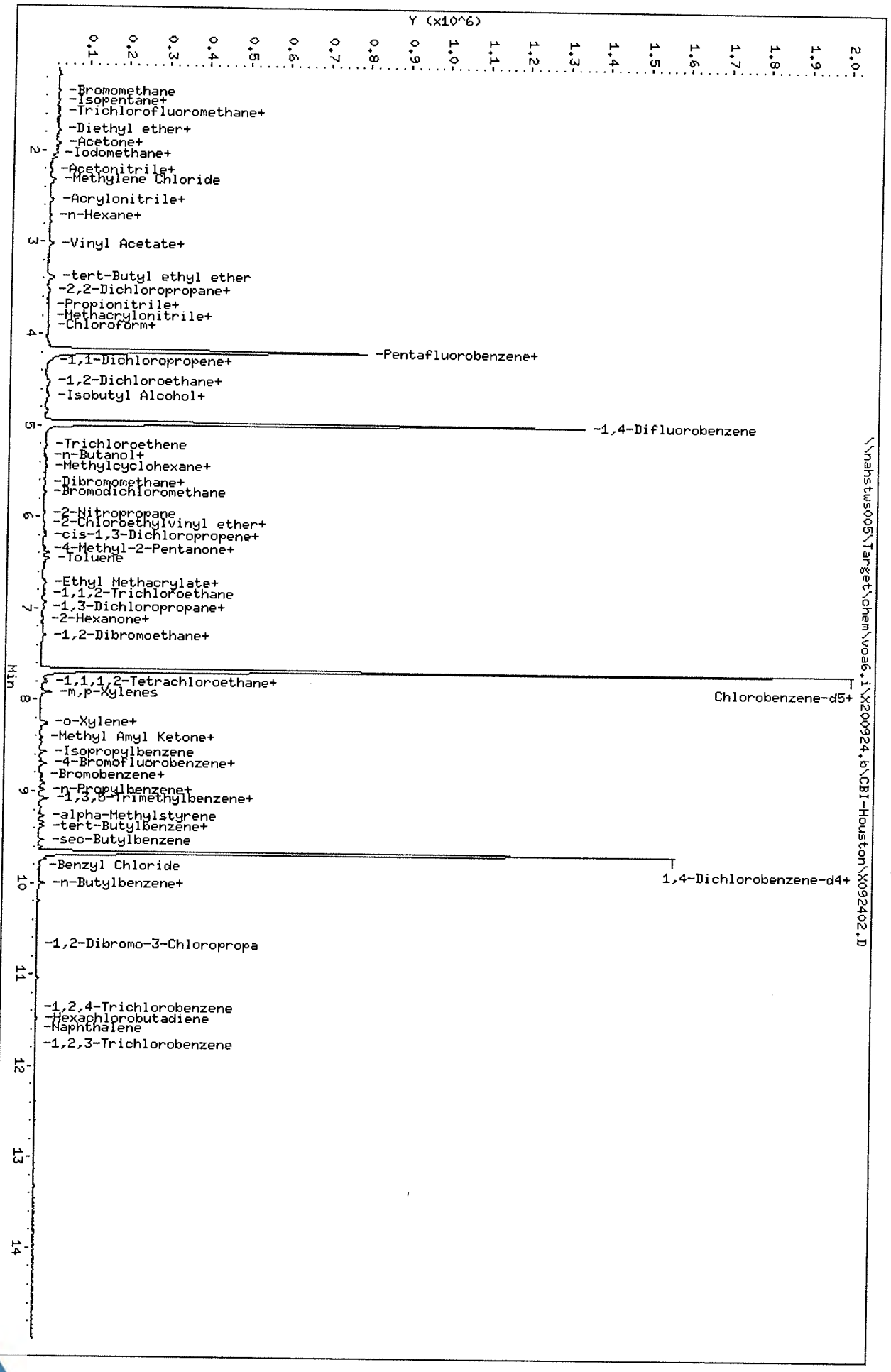
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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	4.189	4.189	(1.000)	689255	50.0000	
$ 30 Dibromofluoromethane	113	4.110	4.110	(0.981)	2163	0.25000	0.30(a)
$ 35 1,2-Dichloroethane-d4	65	4.483	4.483	(1.070)	3033	0.25000	0.39(Ta)
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	1110772	50.0000	
* 47 Chlorobenzene-d5	117	7.670	7.670	(1.000)	970158	50.0000	
$ 48 Toluene-d8	98	6.395	6.395	(0.834)	9651	0.25000	0.37(a)
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	5599	0.25000	(a)
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	403723	50.0000	
56 Tetrachloroethene	164	6.933	6.933	(0.904)	1901	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).



Data File: \\nahstws005\Target\chem\voa6.i\X200924.b\CBI-Houston\X092402.D
Date : 24-SEP-2020 11:34
Client ID: VSTD000.25
Sample Info: VSTD000.25;VSTD000.25;1;1;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

Data File: X092403.D
Report Date: 26-Oct-2020 07:27

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X200924.b\CBI-Houston\X092403.D
Lab Smp Id: VSTD000.5 Client Smp ID: VSTD000.5
Inj Date : 24-SEP-2020 11:58
Operator : PC Inst ID: voa6.i
Smp Info : VSTD000.5;VSTD000.5;1;2;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X200924.b\CBI-Houston\8260W.m
Meth Date : 26-Oct-2020 07:27 voa6.i Quant Type: ISTD
Cal Date : 24-SEP-2020 11:34 Cal File: X092402.D
Als bottle: 3 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOUSTON.sub
Target Version: 4.14
Processing Host: NAHSTW7056

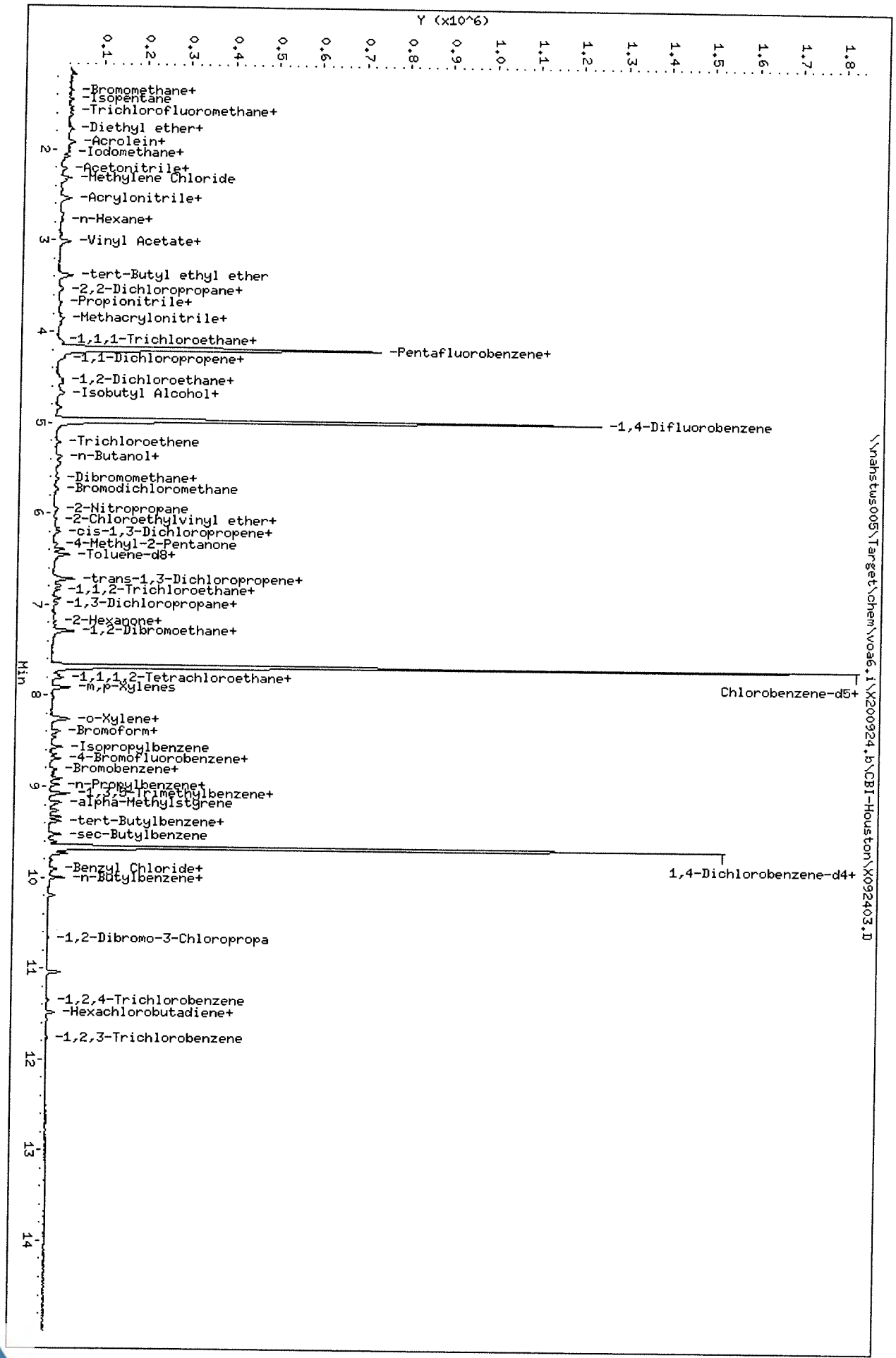
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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	4.189	4.189	(1.000)	642784	50.0000	
$ 30 Dibromofluoromethane	113	4.111	4.111	(0.981)	3913	0.50000	0.59(a)
$ 35 1,2-Dichloroethane-d4	65	4.483	4.483	(1.070)	4097	0.50000	0.56(a)
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	1019136	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	901245	50.0000	
$ 48 Toluene-d8	98	6.396	6.396	(0.834)	14296	0.50000	0.60(a)
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	6772	0.50000	0.04(aM)
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	392686	50.0000	
5 Vinyl Chloride	62	1.145	1.145	(0.273)	4088	0.50000	0.49(a)
11 1,1-Dichloroethene	96	1.919	1.919	(0.458)	3062	0.50000	0.52(a)
27 cis-1,2-Dichloroethene	96	3.538	3.538	(0.844)	4012	0.50000	0.50(a)
33 1,2-Dichloroethane	62	4.569	4.569	(0.919)	4729	0.50000	0.53(aM)
38 Trichloroethene	130	5.221	5.221	(1.050)	3796	0.50000	0.52(a)
53 1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	2965	0.50000	0.55(a)
56 Tetrachloroethene	164	6.933	6.933	(0.904)	2972	0.50000	0.52(a)

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.

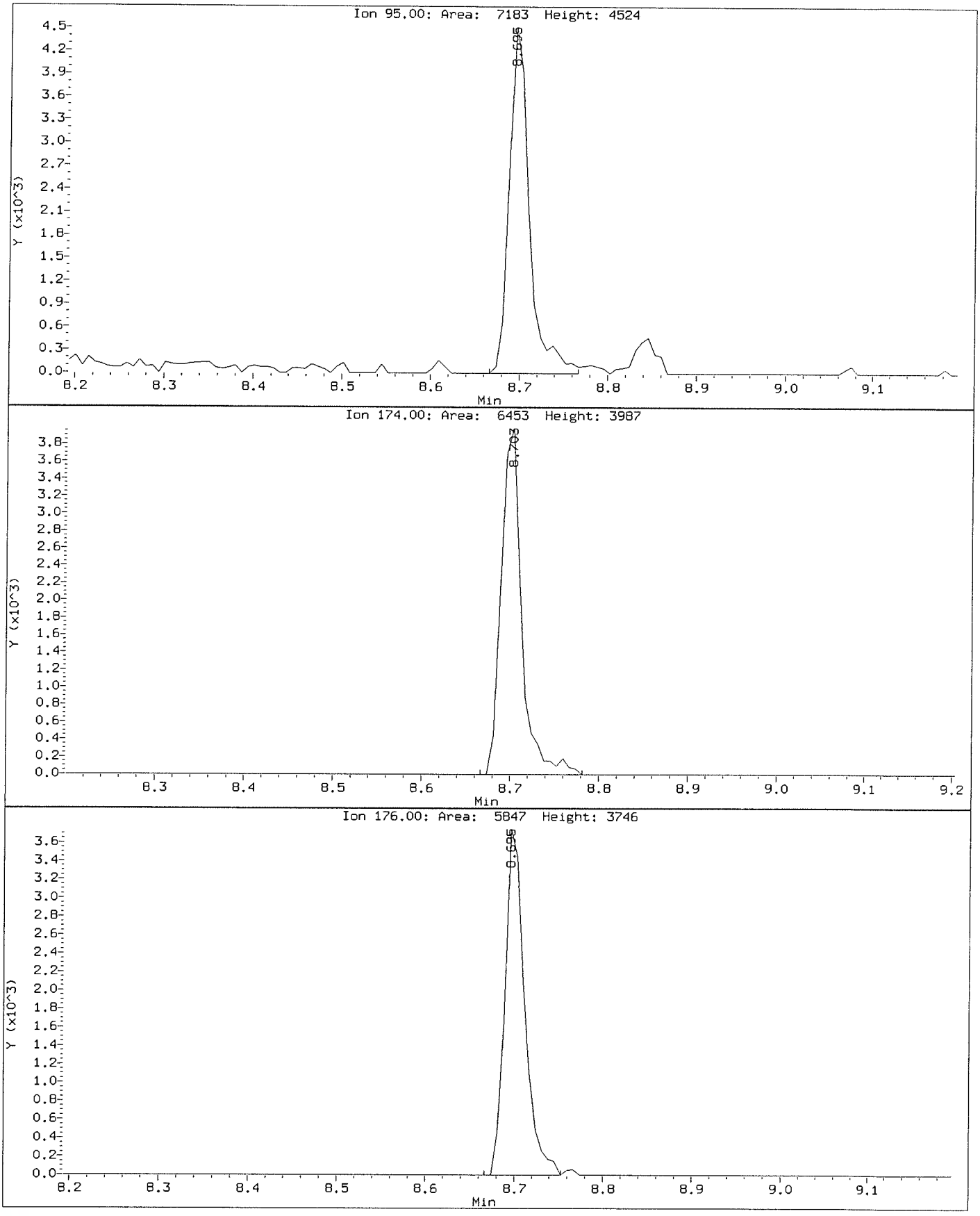


Data File: \\nahstws005\Target\chem\voa6.i\X200924.b\CBI-Houston\X092403.D
Date : 24-SEP-2020 11:58
Client ID: VSTD000.5
Sample Info: VSTD000.5;VSTD000.5;1;2;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

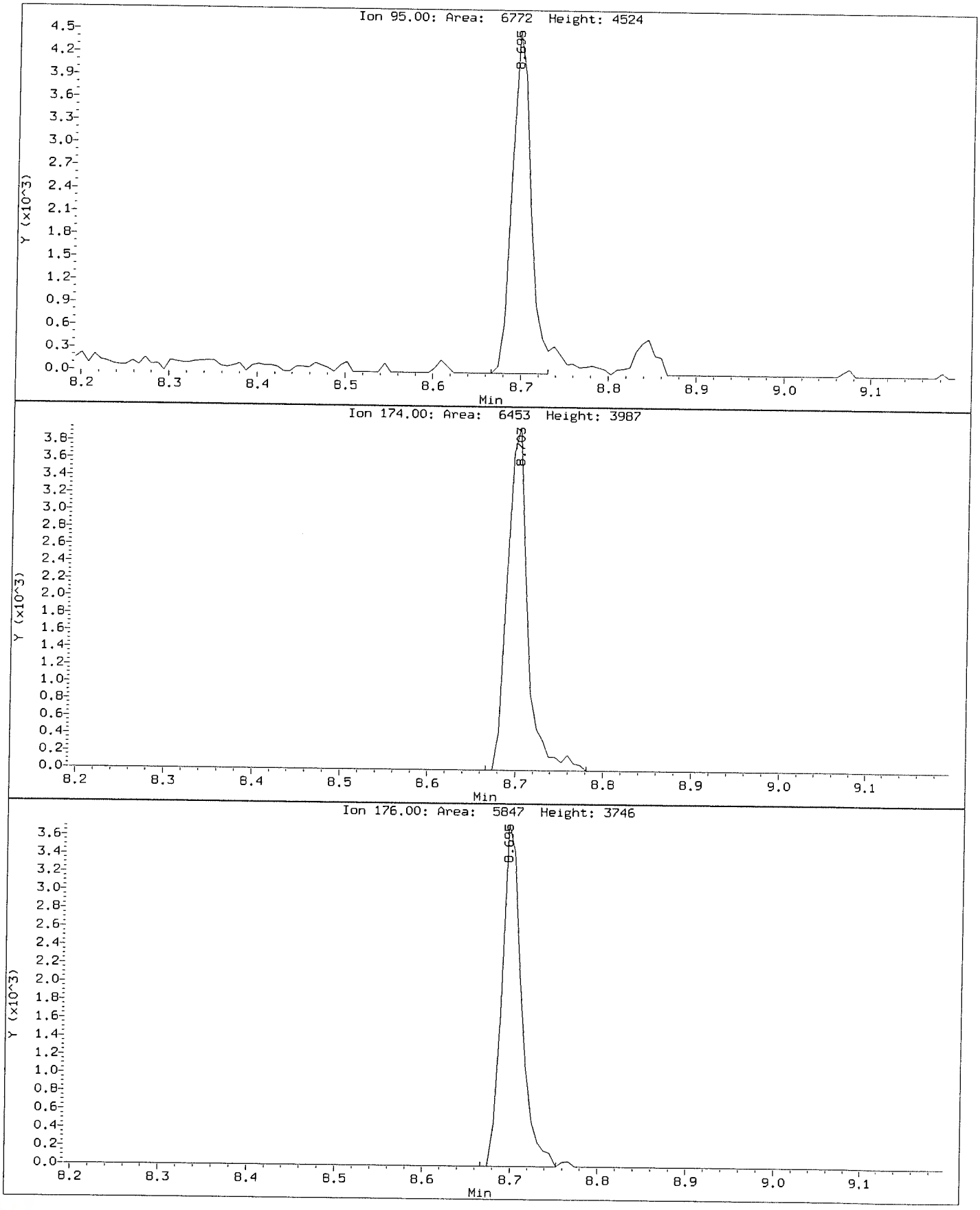
Data File: \\nahstws005\Target\chem\voa6.i\X200924.b\CBI-Houston\Before\X092403.D
Injection Date: 24-SEP-2020 11:58
Instrument: voa6.i
Client Sample ID: VSTD000.5

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



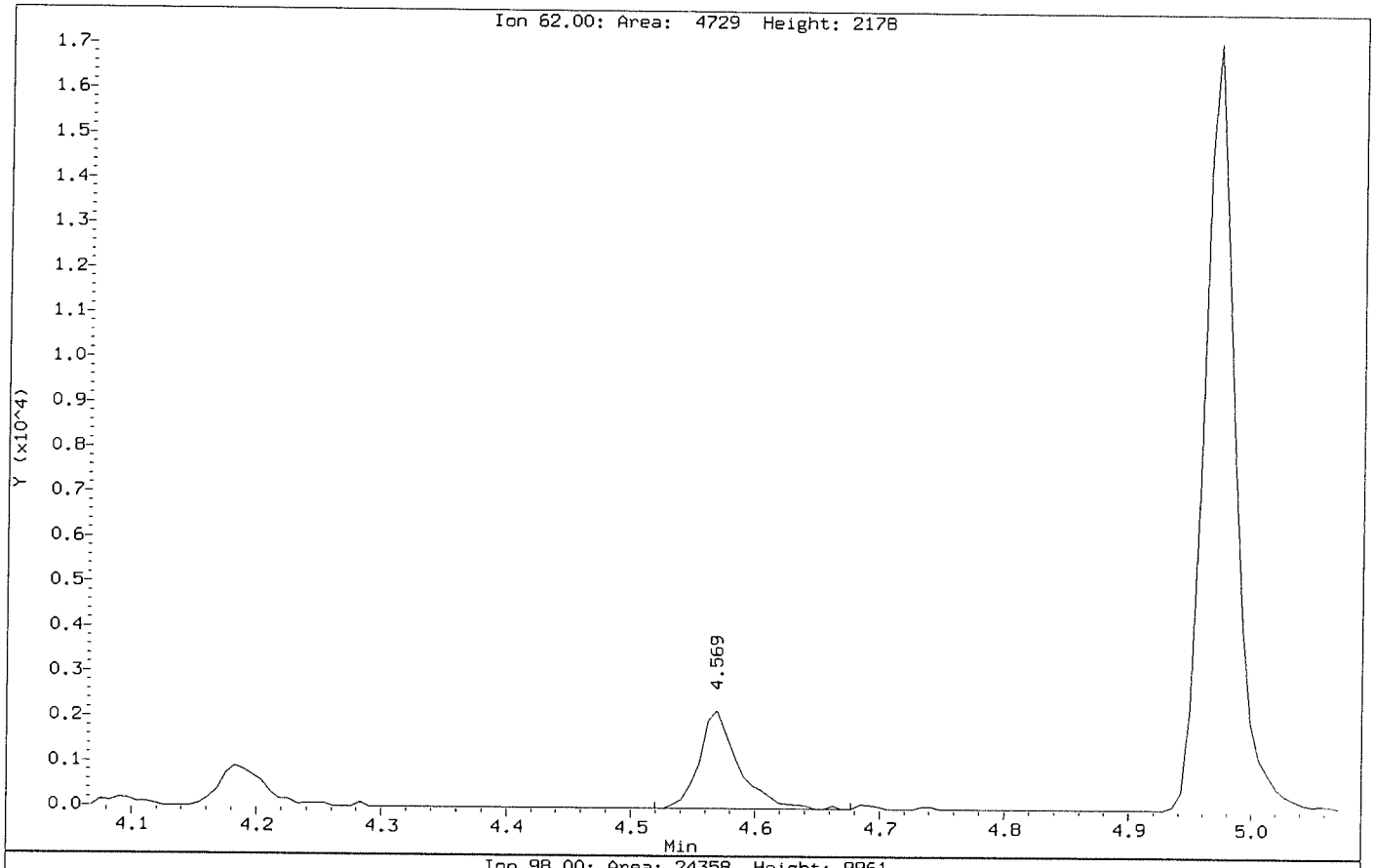
Data File: \\nahstws005\Target\chem\voa6.i\X200924.b\CBI-Houston\X092403.D
Injection Date: 24-SEP-2020 11:58
Instrument: voa6.i
Client Sample ID: VSTD000.5

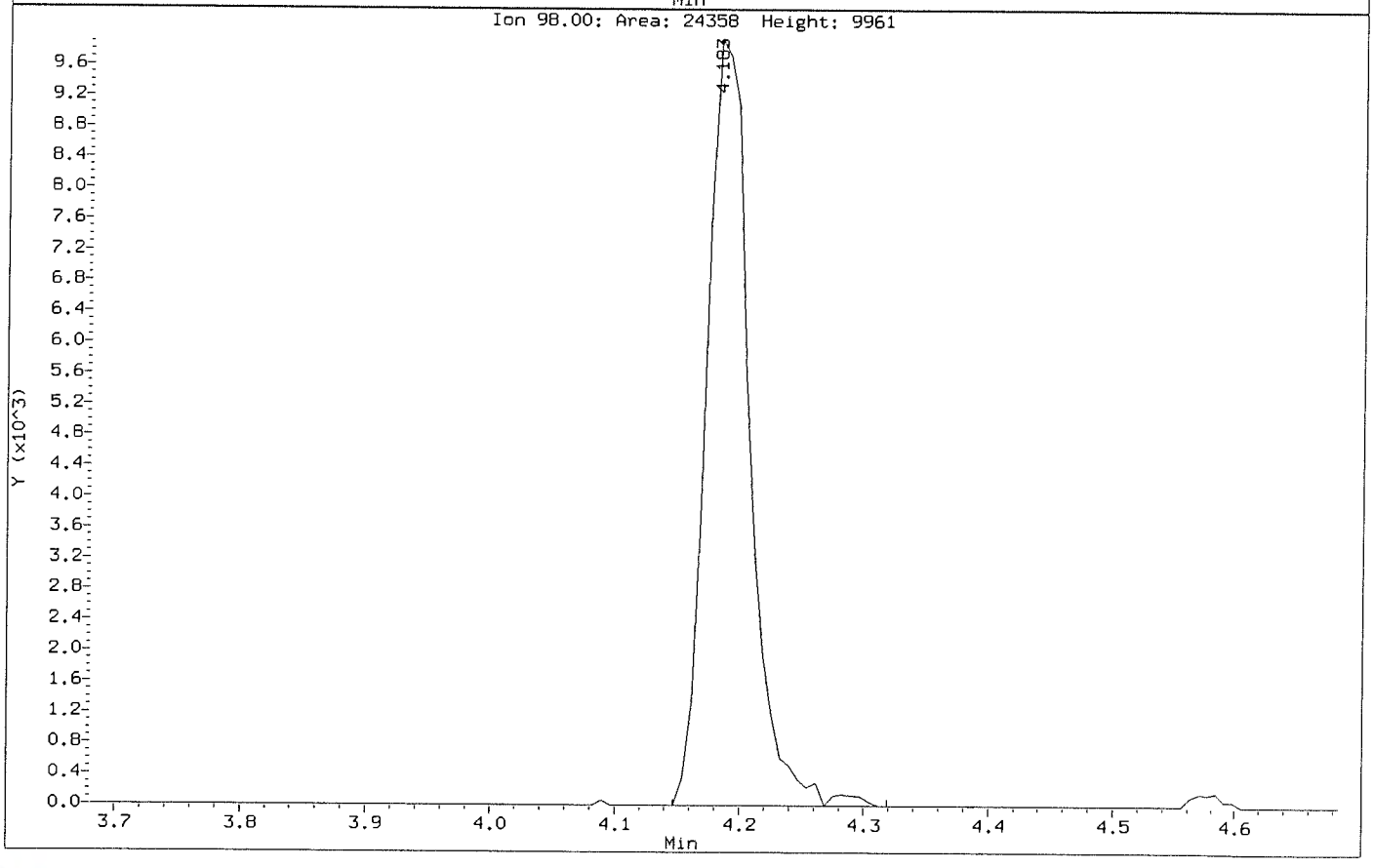
Compound: 4-Bromofluorobenzene
CAS Number: 460-00-4



Data File: \\nahstws005\Target\chem\voa6.i\X200924.b\CBI-Houston\Before\X092403.D
Injection Date: 24-SEP-2020 11:58
Instrument: voa6.i
Client Sample ID: VSTD000.5

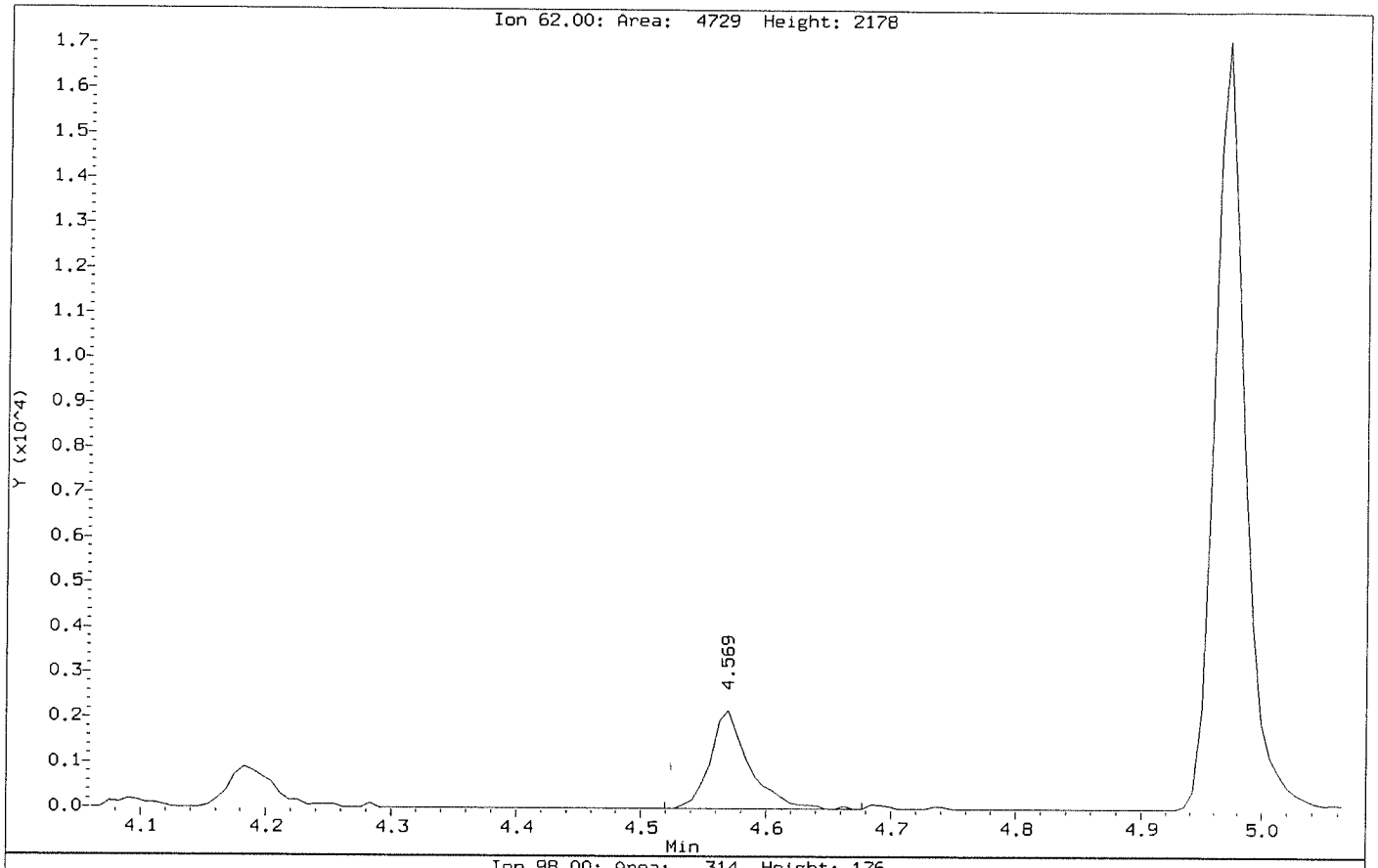
Compound: 1,2-Dichloroethane
CAS Number: 107-06-2

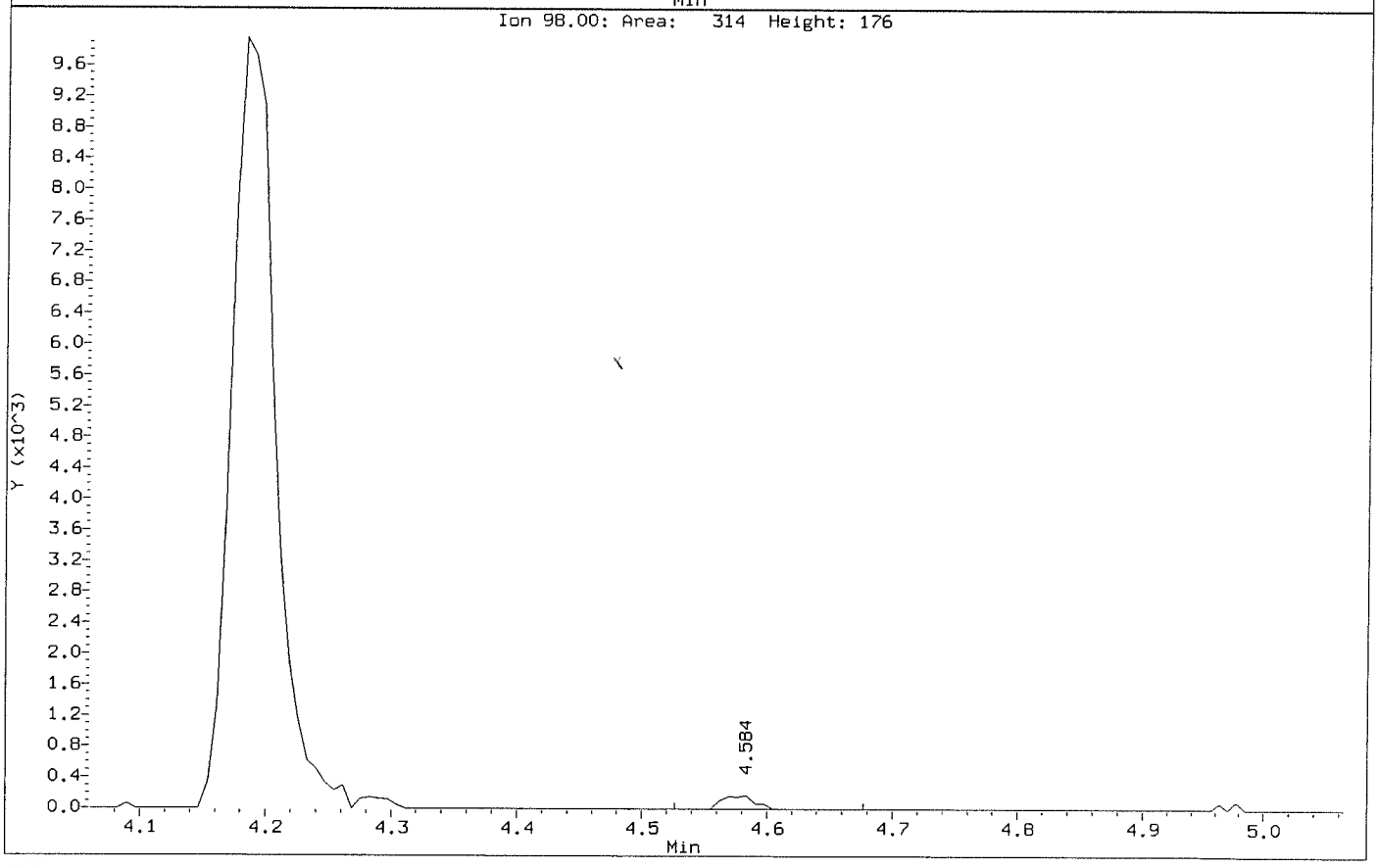




Data File: \\nahstws005\Target\chem\voa6.i\X200924.b\CBI-Houston\X092403.D
Injection Date: 24-SEP-2020 11:58
Instrument: voa6.i
Client Sample ID: VSTD000.5

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





Data File: X092404.D
Report Date: 26-Oct-2020 07:27

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X200924.b\CBI-Houston\X092404.D
Lab Smp Id: VSTD001 Client Smp ID: VSTD001
Inj Date : 24-SEP-2020 12:46
Operator : PC Inst ID: voa6.i
Smp Info : VSTD001;VSTD001;1;3;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X200924.b\CBI-Houston\8260W.m
Meth Date : 26-Oct-2020 07:27 voa6.i Quant Type: ISTD
Cal Date : 24-SEP-2020 11:58 Cal File: X092403.D
Als bottle: 5 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOUSTON.sub
Target Version: 4.14
Processing Host: NAHSTW7056

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	4.189	4.189	(1.000)	632214	50.0000	
$ 30	Dibromofluoromethane	113	4.111	4.111	(0.981)	6507	1.00000	1.00(a)
$ 35	1,2-Dichloroethane-d4	65	4.490	4.490	(1.072)	7341	1.00000	1.03(a)
* 36	1,4-Difluorobenzene	114	4.970	4.970	(1.000)	1010972	50.0000	
* 47	Chlorobenzene-d5	117	7.671	7.671	(1.000)	898139	50.0000	
$ 48	Toluene-d8	98	6.396	6.396	(0.834)	24343	1.00000	1.03(a)
$ 69	4-Bromofluorobenzene	95	8.695	8.695	(1.134)	10018	1.00000	0.47(a)
* 70	1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	383057	50.0000	
5	Vinyl Chloride	62	1.145	1.145	(0.273)	9143	1.00000	1.11(a)
11	1,1-Dichloroethene	96	1.919	1.919	(0.458)	6814	1.00000	1.19(a)
17	Methylene Chloride	84	2.313	2.313	(0.552)	9684	1.00000	0.71(a)
27	cis-1,2-Dichloroethene	96	3.537	3.537	(0.844)	9071	1.00000	1.17(a)
33	1,2-Dichloroethane	62	4.569	4.569	(0.919)	10910	1.00000	1.25(a)
38	Trichloroethene	130	5.214	5.214	(1.049)	8381	1.00000	1.15(a)
53	1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	6343	1.00000	1.19(a)
56	Tetrachloroethene	164	6.933	6.933	(0.904)	6913	1.00000	1.21(a)

QC Flag Legend

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